

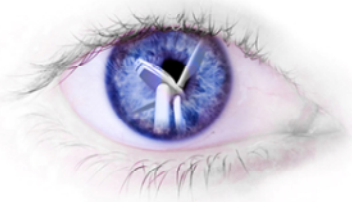


SUZLON ENERGY LTD. SUZLON

Wind Energy Projects - Best Practices

Issues & Challenges

- T. Pradeep Kumar



Vision.

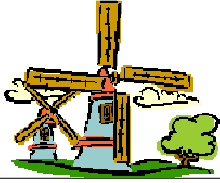
Practice -
A repetitive application methodology to produce intended results in a given set of resources and circumstances.

To achieve this **Vision**, we have to achieve :

- Quality
- Cost
- Speed

Best Practice Vision


...Being the best
Achieving significantly higher than the expectation



...Best Practices


Level Playing Field

- ✓ *Every industry has best practices.*
- ✓ *Best Practices get established over the years*
- ✓ *Function of resources – Technology, Finance, Time, People & Attitude.*
- ✓ *Systems & Infrastructure influences best practices.*
- ✓ *Objectives set the course.*
- ✓ *'Planning' defines the 'means' and 'results' the 'end'.*
- ✓ *Benchmarking is an accepted practice of emulation.*



Wind Energy Projects (Best Practices)

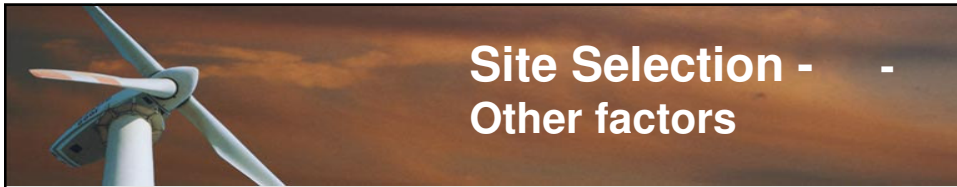
<p>Project Related</p> <ul style="list-style-type: none">✓ <i>Site Selection</i>✓ <i>Project Feasibility</i>✓ <i>Detailed Assessment</i>✓ <i>Project Application</i>✓ <i>Construction</i>✓ <i>Operation</i>✓ <i>Decommissioning</i>	<p>Information Related</p> <ul style="list-style-type: none">✓ <i>Disclosure of Generation details.</i>✓ <i>Insurance & Indemnity practices.</i>✓ <i>Public filing of land related information.</i>✓ <i>Non-serviceability of wind rights.</i>
--	--



Site Selection - - A crucial factor

Influencing
Factors

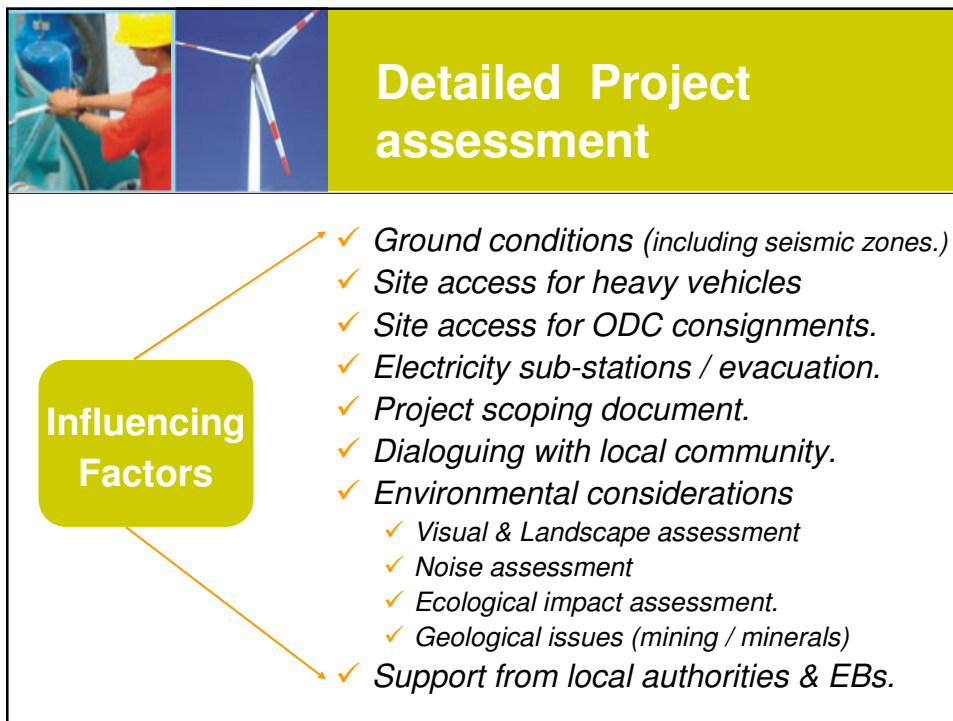
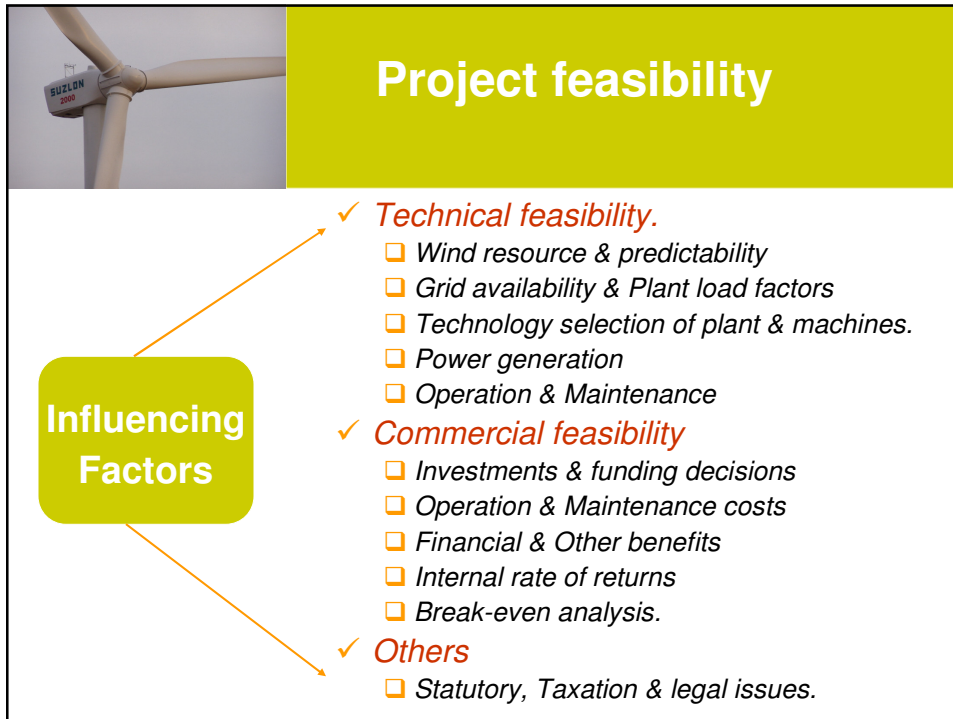
- ✓ *Desk based studies of metrological data.*
- ✓ *Test mast data more accurate.*
- ✓ *Estimation of avg.wind velocity p.a.*
- ✓ *Micro-siting based on land topography*
- ✓ *Calculation of energy density(w/m²)*
- ✓ *Availability of infrastructure:*
 - *Roads*
 - *Telecommunication*
 - *Grid – Transmission & distribution.*
 - *Maintenance facilities.*
- ✓ *Other factors.*




Site Selection - - Other factors

Influencing
Factors

- ✓ *Environmental issues(flora,fauna,erosion...)*
- ✓ *Visibility issues.*
- ✓ *Proximity to dwellings.*
- ✓ *Ecology.*
- ✓ *Archeological / Heritage.*
- ✓ *Recreational usages.*
- ✓ *Conjunction usages.*
- ✓ *Civil / Military airports.*
- ✓ *Restricted areas.*
- ✓ *Safety & security.*
- ✓ *Emergency services.*






Project Application

Influencing Factors

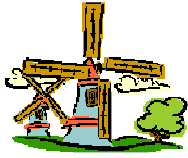
- ✓ *Financial planning & funding arrangements*
- ✓ *Land approvals – Grampanchayat / Forest dept*
- ✓ *Nodal agency project approval*
- ✓ *Local SEB permission for grid interface*
- ✓ *Sales tax registration*
- ✓ *Electrical inspectorate*
- ✓ *Other statutory inspections*
- ✓ *EB certification / charging*



Project Construction

Influencing Factors

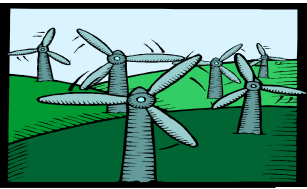
- ✓ *Project planning & scheduling*
- ✓ *Resource mobilization at site*
- ✓ *Dialoguing with local population*
- ✓ *Creation of construction resources*
- ✓ *Phase wise completion*
- ✓ *In-coming quality assurance*
- ✓ *Process quality assurance*
- ✓ *Completion of construction process*
- ✓ *Commissioning*
- ✓ *Generation measurements*
- ✓ *Fine-tuning project performance*



Project Operation

Influencing Factors

- ✓ To establish a comprehensive manual of operation.
- ✓ To keep machine availability + 99%
- ✓ Grid availability ? a SEB subject
- ✓ Spares management
- ✓ Facility management
- ✓ Employee training
- ✓ Operational MIS
- ✓ Fine-tuning & improvements
- ✓ Periodic maintenance, repairs and replacements



De –Commissioning of spent Projects

Influencing Factors

- ✓ Wind mills having outlived their life / useful performance period needs to be de-commissioned.
- ✓ De-commissioning may require permission from local authorities.
- ✓ Life extension / replacement programmes can be worked out.
- ✓ Care should be taken to avoid collateral damage during de-commissioning.
- ✓ Depreciation amounts are normally set aside during the useful life period of the equipment.



Disclosure of Generation details

Influencing Factors

- ✓ *Periodic sharing of generation information is useful to build a strong databank for further investment.*
- ✓ *Information sharing includes energy generated, avg. wind velocities, power factor, RKVAH, grid availability, machine availability etc.*
- ✓ *Disclosure of power purchase agreement and service level agreements is beneficial to potential investors.*
- ✓ *Any unforeseen issues that have profound impact on the generation of wind energy should also be shared.*



Insurance & Indemnity practices

Influencing Factors

- ✓ *Currently, the equipment and parts are covered by insurance for accidental break-downs.*
- ✓ *When the industry matures and backed up by a strong industry association, it may be possible to insure performance also.*
- ✓ *The current industry practice is to guarantee energy generation (or PLF) to the investor.*
- ✓ *Machine availability is also guaranteed by the wind farm developer.*
- ✓ *However, grid availability is the most important factor to be ensured by SEB.*
- ✓ *Currently, some SEBs owe money to wind mill customers against power purchased.*



Excellence as a Habit...

Industry Strives on Best Practices

- *Integrate "Best Practices" into SOPs*
- *Minimize adverse impacts through project design and mitigation (if need arises)*
- *Make the environmental case for wind strongly to NGOs and regulators.*
- *Start early on permissions and spend quality time on education of regulators and investors.*
- *Develop best industry association with transparency in information sharing and symbiotic relations with society.*
- *EDUCATE, EDUCATE and EDUCATE on the Green Power for Future.*

