



## **Risk Management Policy**

### **Preamble**

Every business is prone to various business risks whether financial or non financial. Risk and opportunities are two sides of the same coin. Invariably no entity can operate or have the assurance of carrying on business in a totally risk free environment.

Renewable energy plays a vital role in moving towards a low carbon economy and providing a secure supply of energy. Research and development over the years have brought a number of renewable energy technologies especially in wind power and the technology has substantially matured and has been able to spread its wings in number of countries as a source of additional energy.

Even though Karma Energy Limited both as a long term business strategy as well as short term and in day to day operations continuously factors in the risk aspects by properly identifying, evaluating and mitigating the same, for the sake of good order and further now as mandated by Companies Act, 2013 as well as clause 49 of the Listing Agreement dealing with corporate governance, the risk management policy is being formalized in writing for the benefit of all stakeholders.

The risk management policy can never be a stagnant document but calls for periodical review as business situations continuously change and there is always a need to revisit the policy document for amendment or modification to meet the changed requirement.

Companies Act, 2013 u/s.134 dealing with Financial Statement and Board's Report stipulate a disclosure in the report of the directors to be made on ***development and implementation policy for the company including identification therein of elements of risks, if any, which in the opinion of the board may threaten the existence of the company.***

Clause 49 of Listing Agreement dealing with Corporate Governance states that

- A. The company shall lay down procedures to inform Board members about the risk assessment and minimization procedures.***
- B. The Board shall be responsible for framing, implementing and monitoring the risk management plan for the company.***
- C. The company shall also constitute a Risk Management Committee. The Board shall define the roles and responsibilities of the Risk Management Committee and may delegate monitoring and reviewing of the risk management plan to the committee and such other functions as it may deem fit.***



## **Risk Management**

The term “**risk**” can be defined as a chance or probability of happening or incurrance of certain events or outcome or the non happening or non occurrence of the events or outcomes. Generally it is understood in a negative sense and hence its meaning includes hazard, possibility of bad consequences, loss, which could lead to loss or damage to the property, profit, cash flow or capital of a business and can threaten the existence of the business itself.

The objective of risk management is not to consider the ways and means as to how the risk can be avoided or eliminated but to minimize the loss or damage arising from certain unexpected or undesirable events, the happening of which was only a certain probability. In nutshell, the aim is to take risk but mitigate the loss. The aim of risk management is to protect the flow of revenue as well as assets and properties of the company against any loss or liabilities that may arise out of various risks exposures.

The risk management adoption is a positive and proactive managerial action to reduce the loss and costs and maximize the returns to the stakeholders. Any organization do not wish only to carry on business operation for maximizing profit but ensure sustainability in the profitability for steady and positive growth of the company. Hence risk management is an ongoing exercise. The absence of risk management policy can threaten the very existence of a business.

Thus risk management calls for conscious and calculated risks to be taken with complete knowledge and understanding of the pitfalls and quantum thereof and ensure optimization of the risks, profitability and growth of the company.

The process of risk management includes

- a) Planning
- b) Decision making
- c) Organizing and
- d) Control

**Planning** involves

- a) Investigation
- b) Identification
- c) Evaluation including classification, quantification, reporting – its frequency & impact

**Decision** making involves

- a) Loss prevention or avoidance
- b) Loss reduction



- c) Loss absorption
- d) Insurance or risk transfer

**Organizing** involves implementation of risk management techniques

**Control** encompasses evaluation of result of application and documentation

### **Risk Categories**

The risks can be categorized as Business Risk and Non Business Risk. Business Risks are those which any business entity willingly assumes to create a competitive advantage for itself and add value to the stakeholders. The same could be its product market, technology, the produce design, credit risk, operational risk, macroeconomic risk resulting from economic cycles, monetary policies, etc. Business risks would also include financial risks to certain extent like interest rate movement or meeting the financial obligations

The Non Business Risks are many a time beyond the control of the business entity and this would include fundamental shifts in the economy, political environment

### **Specific Risks in RE Power and Measures for Mitigation**

In recent years there has been exponential increase in use of renewable technologies to generate power. India as well as many developed and developing countries world over are focusing on new sources of energy and this has increased the investment in renewable technologies.

In India, amongst all the renewable sources of energy, wind power leads the pack with about 55% of renewable power being from wind.

The company which is predominantly in the wind power sector, it has to encounter numerous risks factors from the conception to the commissioning stage. Each project installation offers different risk challenges and this includes the general environment, the natural calamities, planning, availability of equipment including material handling equipment in a timely manner and last but not the least the loss of profits which an entity has to encounter on account of equipment breakdown.

Though the company has been factoring in the variety of risks which are generally encountered in its business, as a policy document on risk management special emphasis is required to be given on the following :



## **Selection of site**

The edifice of success of the wind power project is the right selection of the site. It is mandatory that detailed wind study is carried out by installation of wind mast at different locations and at different heights to capture the wind data for further detailed analysis of the wind direction, wind frequency, wind density, etc. It is always advisable to carry out study over minimum two wind seasons to understand the variability in the wind pattern over a period.

Since essentially the wind turbines when installed is required to be connected to the grid of the State Utility, the availability of proper and adequate capacity substations for power evacuation need to be evaluated. Many a times the responsibility of constructing a substation or laying overhead lines from the wind farm site to the substation is passed on to the developer and this would entail substantial additional costs which also need to be factored in while selecting the appropriate site itself.

## **Site Specific Turbines**

There a number of manufacturers of wind turbines and in the past few years the market is for high capacity wind turbines to be installed at a greater height of 80 meters plus. Consequently the cost of equipment and installation is also relatively much higher than the cost prevalent about 5 to 6 years back. Since wind power project is capital intensive, it is essential that right type of turbine suitable to the site vis-à-vis cost of the equipment is evaluated thoroughly. Based on wind study, turbines with specific cut in and cut out speed could be procured so that generation is optimized.

It is also essential to evaluate the operational experience of the turbines in different terrain as the turbines may fetch good output but would also be prone to frequent breakdowns necessitating incurring of high cost on material handling equipment, storage of high cost inventory, mobilization of technical experts, etc. to ensure least down time. Hence selection of turbines which is site specific must also factor in the long term trouble free operation of the said turbines.

## **Micrositing and Design of Foundation**

The success of wind power generation considerably depends on the location where wind turbine is installed. Even slightest uneven elevation on the ground or shadow effect of other turbines or any structures including trees of greater height can adversely impact the performance of the turbines and generation.

Considering the size and weight of modern wind turbines it has become vital that geo technical conditions are correctly evaluated and design of the foundation is sound and reliable. Lack of proper foundations can lead to collapse of the turbines. Therefore a complete assessment of geo technical conditions and foundation design is an important input for functioning of the turbines.



## **Climatic Conditions and Natural Disasters**

Generally renewable energy projects especially onshore wind power is in remote places, hilly areas, and is susceptible to local weather conditions and natural environments. The technology of the turbine selected and design of the foundation to be suitable to withstand the prevalent natural adverse conditions at the site.

The site conditions may include wind with high velocity or harsh winter conditions which can impair installation of the turbines and at times the Engineers may have to stay put at site for many days expecting suitable site condition before installation could be commenced and completed.

## **Access to site**

Since wind power projects are generally in remote areas, the access to site is an essential factor which has to be evaluated at the planning stage itself. Lack of proper approach roads can adversely impair movement of material handling equipment. The need to lay or relay the roads and making power evacuation arrangement over long distances can be a costly affair and at times an essential cost to be incurred if the selected site is so good that the returns from generation can offset such additional cost. However it is essential that the aspect of access to site is properly evaluated so that the cost thereof is also factored in for computing the expected return from the project. Many a times the exorbitant costs to be incurred on accessibility to the site can even lead a decision to abandon the site.

## **Erection and Commissioning**

The cost control in installation of wind power projects is highly influenced by timely availability of suitable material handling equipments like cranes. Since in the present days turbines are heavy and are of higher capacity and perched on a greater height of 80 meters plus there is a mandatory need for high capacity cranes for lifting and reaching out to such greater heights. Ensuring availability of the required capacity cranes, its mobilization, demobilization and ensuring that the equipment is optimally utilized with much lesser idle time can save considerable cost in the erection of the turbines.

The testing of the equipment both at the time of manufacture as well as before erection can considerably mitigate the risks and exposures that arise if proper testing of the equipment is not carried out. Such testing are not only to be carried out but also carried out with calibrated tools and laid down proper methods to ensure the quality standards are complied with.

## **Security**

As the wind farms sites are in remote places and nowadays many wind farms are connected to centralized monitoring systems, there are every possibility of lesser manpower



engaged especially in the operation and maintenance phase. Also with modern tools and equipment even in installation phase many a times lesser manpower need to be employed. The negative aspect of the same is invariably the equipment remains unattended and are prone to theft and damage by unscrupulous elements. The modern equipment comprise of lot of electronic components, copper cables, metal components which are all of costly nature and theft of the same can fetch good money to the culprit.

Also local political environment can also play an adverse impact in the form of vandalism and arson. There are areas which are infected by the naxalite movement too. Though such elements may not have any enmity with the wind power project or their personnel, the project and the personnel of the company can be misused by these anti social elements for their bargaining strength against the authorities.

In view of the above, evaluation of the local environment, proper and reliable security measures is essential from the planning stage itself and extend even during operation and maintenance. Good and reliable security, efficient monitoring systems can reduce such security exposures.

### **Operation and Maintenance of the Equipment**

The operating losses in wind power is on account of grid failure, lack of availability of wind, machinery breakdown, force majeure causes, interference by the local people, etc

Grid failure is invariably beyond the control of the company.

Lack of availability of wind yet again an element not in the control of the company but the company ought to have factored in the wind variability from season to season at the planning stage itself.

Force majeure causes is again not a manmade element and requires proper risk coverage through insurance policies.

Interference by local is again beyond the control of the developer and at best the company can ensure cordial relationship with the local society. However the company must obtain insurance cover for mitigating risks like malicious damage, theft, etc. that could be caused

Machinery breakdown is materially within the control of the developer. The least the machinery down time, the better for the company to harness the wind power. The company must ensure availability of spares and components, tools and equipments, material handling equipment, technical expertise to attend to troubleshooting and replacement of parts and components where called for. Sourcing of correct parts or critical components for which delivery time is long can adversely affect the generation potential of the turbine for the specific period. The company has to properly evaluate and trade off the carrying cost of inventory including insurance premium thereof vis-à-vis loss of value of generation on account of lack of availability of required parts and components. The



availability of critical components in right quality and quantity is a must especially considering the fact the wind farm projects are in remote places and it takes time for sourcing and receiving delivery of such critical parts and components.

The essential equipment in wind turbines like gear box, blades, need extra care as these are not only costly but maintaining spares could be a more costly affair.

Negotiating a good warranty at the time of purchase of turbines and later procurement of critical parts and components plays a vital role of providing protection against material cost of the equipment failure albeit it would not insure against loss from business interruption.

It is not only ensuring availability of proper parts, components and tools but it is more important that these items are properly and securely stored, precautions on maintenance like oiling, greasing, calibrating are periodically carried out so that when needed these items can be used without further work on the same.

Continuous monitoring of the wind turbines both physically as well as through control systems is a must for early detection of any defect developing so that potential problems are detected, attended to and eliminated to minimize or even eradicate the potential damages both to the equipment as well as in the form of loss of value of generation.

The overall operation and maintenance costs and whether to carry out the operation maintenance in-house or engage contractors on comprehensive or non comprehensive basis is also an essential element influencing the cost of operation of the wind turbine.

Since generally wind pattern follows a system of high wind and low wind seasons in India, it is imperative that during low wind season proper and systematic preventive maintenance of the turbines are carried out so that the turbines are ready for the next wind season to harness optimum wind power.

### **Fire Protection**

It is seen that fire even though not a frequent calamity, when occurs causes extensive damage not only to the installation but also to the company personnel working around. The fire can emanate from hydraulics, gear boxes, fuel sources, etc. Hence it is essential that the turbine installation is well equipped with fire detection and fire control and extinguishing of fire systems are available at site. Such systems and equipments are also required to be periodically maintained so that when needed they are in working condition and is of utility value for which it is meant for.

### **Financing of the Project**

Financial risks are non technical risks involved in a wind power project. They could be in the form of exchange rate risk if financing is from foreign currency loans and interest rate risk irrespective whether borrowing is in India or overseas.



In the event of financing of the project under Foreign Currency Loans it is essential that the company evaluates the exchange rate risk over long period of repayment of the loan and opts for optimum mix of forward contract to mitigate the exchange rate risk in a volatile market. Leaving the risk un-hedged could prove to be a disaster if there exist a sudden and volatile adverse exchange rate movement.

Apart from exchange risks, interest rate risk is also a costly risk. Currently many a financial institutions extend floating rate risk which though may prove to be beneficial in the initial stages of the project can prove dear in the runaway hike in the interest rate which is directly linked to macroeconomic situations.

Liquidity risk is yet another important aspect of the project. With uncertainties in policy related matters, of both Government and Regulatory authorities, invariable misinterpretation of the provisions of law and regulations by the state utilities is a great concern when certain approvals for say third party sale or execution of PPA is delayed inordinately beyond one's comprehension can lead to lack of realization of generation dues. The financial situation of many state utilities in the country being precarious there has been default in payment of generation dues by many such utilities. Even though these risks are invariably beyond the control of the company, the adverse effect is lack of liquidity leading to payment default to the lending institutions which in turns suffers from Non Performing Assets and financing of wind power projects considered a high risk preposition and even credit rating of the company getting a beating.

### **Other Risks**

Risks in the form of availability of quality technical personnel, compliance with legal provisions applicable to operation of the wind turbine, in wind power industry is of lesser magnitude but not to be ignored. The number of people required for operating and maintaining wind turbines is relatively less as compared to other industries and currently market do produce technically sound personnel. The legal compliances involved in wind turbine industry are generally the normal applications of labour and economic laws and is a regular matter.

### **New Risks**

The company has adopted different strategies in different states where its wind farms are operating. In some states, the sale of power is to the state utilities wherein there are lesser issues. However the tariff applicable on the post initial validity of Power Purchase Agreement has proved to be a critical one. But unfortunately the said risks has been beyond control since proper alternative is also not available.

In certain states the company has opted for open access wherein too frequent hiccups is arising by constant change in the settled procedures by state utility and at times the



regulatory authorities in the larger interest of the financial position of the state utilities which has been precarious for quite long accepting the suggestions of such state utilities at the cost of smooth and economic operation of the existing wind farms.

Though wind power is a miniscule contributor to the total energy handled by the grid in the state as well as nationally, unfortunately the regulatory authorities have not been differentiating the non conventional energy vis-à-vis conventional energy and introducing concepts like scheduling of wind power which is next to impossible on account of its infirm nature, attempting to adopt competitive bidding, etc. which are new risks round the corner, the mitigations of which could be at high cost and high uncertainty.

### **Risk Control and Follow Up**

After the identification of the risks and evaluation, the next step to be on the risk control and follow up mechanism. The risks involved in a typical setting up of a wind farm and operation and maintenance thereof detailed above need a proper corporate control procedure which calls for allocation of responsibility for action at every stage of the project.

The strategy should detail the risk management plan involving defining the objectives, ensuring resources, fixing timelines, accountability and reporting indicators and frequency.

At the end of the given project, the project risk plan is required to be compared against the actual project journey and achievement thereof. The report could address issues like

**Political risks** which are often characterized by discreet event where developer hardly has any control. This could encompass the stability of the central and state government for stable policies affecting renewable energy, energy and climate policy changes, fiscal benefits like accelerated depreciation, generation based incentive, concessional excise, customs and VAT, Government investing in infrastructure, the clarity and speed with which the policy and operating issues are dealt with by Electricity Regulatory Commissions, Appellate Authorities and Courts.

**Economic risks** which could be managed through insurance, negotiating guarantees, opting for derivatives in financing and risk transfer process. This also include interest rate risk, credit risk, currency risk where imports and finance arrangements involve foreign currency, insurance premium, feed in tariff determined by the Regulatory authorities, land lease and labour related issues.

**Social risks** addressing safety, social and environmental impact like adverse effect on flora, fauna and climatic changes – there have been issues in the past when the projects have been blamed for death of migratory birds or having adverse effect in the rainfall. The expert committees however have negated such adverse impact.

**Technical risks** managed through guarantees, warranties, insurance, etc



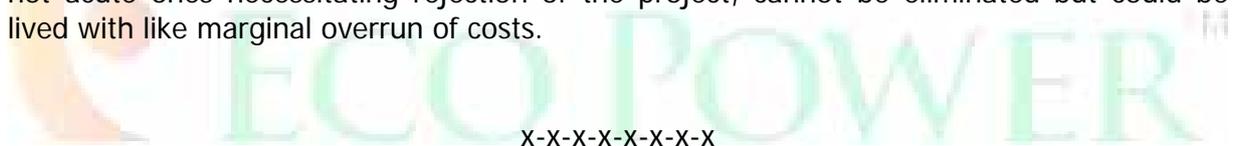
During implementation stage the risks can be categorized to high risk, medium risk, low risk so that acute ones are focused upon. The risk can also be matured or known risk, known unknowns i.e. emerging risks, unknown unknowns i.e. latent risk which were never expected but which can crop up or arise in the progress of the project.

The risk control from the stage of setting up and during operation to factor in the effect of risk on both schedule and cost

A statistical probability distribution can represent each risk and related cost and duration of the activity. The tools could include scientific budget, critical path network

**Sensitivity analysis** is an important tool to be applied even before venturing into the project. The mathematical model adopted must provide different scenarios if different variables are changed so that the ultimate decision is scientific and based on clear cut objectives and returns expected for a set of parameters.

Basically the risk control strategies must consider the probability and consequence of the risks and focus on main risks through proper evaluation. The normal process amongst the stakeholders involves collection of information, brainstorming, prioritization and mitigation plans. The process of risk management would necessitate avoidance like change of the project plan on account of time, costs, scope, quality, etc. Mitigation i.e. reduction of the probability of adverse effect and taking early action to reduce the adverse risk factors, transferring or sharing the risk element say through proper insurance of the risk or through negotiation of warranties and guarantees, acceptance of the risk as certain risk which are not acute ones necessitating rejection of the project, cannot be eliminated but could be lived with like marginal overrun of costs.



X-X-X-X-X-X-X