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**RENEWABLE
ENERGY**
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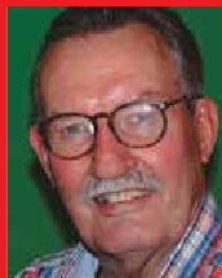
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A MACRO VIEW ON WIND TURBINE LOGISTICS IN INDIA

Transportation of massive abnormal structures and weights of multi megawatt wind turbine components in windy places located in remote and narrow villages, hills with many bends and dangerous hairpins throughout the year on all seasons are challenge that every wind turbine manufacturers must be treaded off. Especially in a vast country like India, where diverse regions and culture with limited infrastructures availability, challenges of transporting project cargo are simply overwhelming and the available options are limited.



India has surrounded on three sides by oceans, endowed with many rivers, canals and has plenty of major and minor sea ports. Indian hinterlands are well connected with rail, road and air networks. These facilities and infrastructures are really world's standard and facilitates the transportation of small and general cargos with utmost ease, throughout the year day and night on all seasons. Wind industry's oversized and overweight abnormal cargos transportation on rail, air and sea is so far not cost effective and consume more transit days, faces cumbersome procedures, complex printed documents and also multiply material handling. Wind industry requires cost optimised, stable and robust logistics system to continually transport these oversized and overweight components like tubular tower shells, lengthier rotor blades, generator assemblies and nacelle assemblies to remotest wind farms located in sea, desert, valley, hills, rural areas, etc.

Multi-modal transportation is a way forward for wind turbine components futuristic transportation plans. But, at the present juncture road transportation is the only cost effective, stable, robust, dependable and end to end logistics option available for oversized wind components delivery to wind farms located in across India.

Wind turbine manufacturers are in general having logistics departments and logistics experts on their roll; through them wind turbine companies outsource their complete or major vehicles requirements from the small and exclusive transport vendors, presently serving the wind energy sector in India.

Transportation of wind turbine oversized components though increased in size and volume year on year have been primarily being done through road transportation. Over the years, the type of deployed trailers, prime movers, skills of drivers and the standards of escort team are all changed with the changing requirements, but, certain pricking issues and the stumbling block of free movements still remains the same. These problems are getting worse and worse with every passing day. On an average wind turbine over dimensional cargo component has to travel minimum distance of 500 kilometres and a maximum distance of 2500 Kilometres to deliver them to wind farm sites from origin to destination.

The outsourced transport vendors are facing flak on every movement, while carrying the oversized wind components from the RTO, highway police, check posts, delay at tolls, harassments by local thugs, villagers, etc. India has federal

Governments structure i.e. Central Government and many State Governments. The Central Government can enact and amend the existing Motor Vehicles Act and can provide direction and guidelines to the many State Governments but every State Governments is having their own Motor Vehicles Act to protect their State interests, seize overloaded vehicles and goods, levy penalty and collect revenue thereon. When an oversized component transported through various states from the origin to consumption point, the carrier of the component has to go through different state government Act, procedures, check posts, RTO, highway police, tolls, etc.

This is the grey area where the cost of road transportation shoots up beyond the simple calculation of vehicles purchase cost, diesel consumption, manpower cost, capacity utilization, establishment cost, insurance, permit, maintenance, road tax, toll, interest, depreciation, etc.

Wind turbines components vary in size and weight are changing fast due to the requirements of higher megawatt machines in India. In turn the requirements of wind components transportation vehicles are also changing. The transport vendors due to the wind industry's ever changing requirements are forced to upgrade their vehicles or phase out their existing fleets, so as to exist in the wind industry. This requires massive investment from the transport vendors and there exist fear and drastic reduction of shelf life of vehicles with regard to transportation of wind components. This phenomenon shoots up the freight cost of wind components.

Wind companies are in constant search to reduce or optimise wind turbine components delivery time and cost to the wind farm sites, so as to be competitive in the market. There are various visible and invisible factors influencing the logistics cost and the time to deliver. Wind companies manufacturing facilities are spread across India and their ever increasing abnormal, oversized rotor blade length has gone beyond 60 meters. Overweight nacelles, generator assemblies, tower bottom sections have gone beyond the 100 Metric ton unitised weights. The





size and weight of this nature would pose big challenges even in developed nations around the world. An aspiring country like India must have lion heart to stave off multiple challenges to live and work with traditional mindset of Government officers, archive and redundant laws, handling multiple documentation in every passing state, acceptance of regular delays at RTOs, police, toll, villages, coping with lack of motorable roads, narrow and sharp 'T' turnings, vertical and horizontal obstacles on national highways and the long distance to travel, the disturbance by the locals, petty politicians, thugs, drunken drivers, encroachments in the middle, edges and turning of road.

The wind companies to upscale these massive logistics challenges simply outsource their transport services through the specialised transport vendors.

The logistics specialists in every organisation, if, properly understands these influencing visible and invisible factors, they can surely optimise their overall logistics cost and to reduce time to deliver oversized wind components at various wind farms located across the nation in all regions and on all seasons. The world knows that wherever the wind blows, there surely the economic prosperity follows. This dictum is known to all the stakeholders in wind industry. Here, we suggest few unconventional approaches and innovative ideas to optimise the logistics cost and the transit time.

Rationale behind not entering Annual Transport Contract

Most of the wind companies in a hurry to budget their annualised logistics cost in the beginning of financial year is going for annual transport contract for small and generalised cargo, which is quite a volume for all the wind turbine manufacturers. Here lies an opportunity to hire truck market vehicles on spot freight rates. In India, the generalised cargo carrying vehicles are available in plenty throughout the year in all locations with minimum of 25%



to 35% less than the annualised transport contract freight rates. All that wind companies should do is to engage a person with hands on experience in trucking company's traffic department and have a direct contact with brokers and enrol memberships in online truck hire websites. A massive freight rate reduction and efficient delivery system can be created through these arrangements for small and general cargo transportation. Only grey area of this unconventional method is that wind companies must be prepared to pay the truckers at the point of material delivery or at the maximum can avail short credit period.

Cost Components of Freight Rates for Oversized and Overweight Components

Wind turbine major logistics cost goes into transportation of ODC and OWC components. Dissection on freight rate cost components would highlight an invincible and invisible major cost component i.e. expenses towards RTO, police, locals, thugs, etc., in connection with the transportation of ODC and OWC components from the origin to delivery. These expenses would normally occupy around 30% of the freight rates. If all the wind turbine components transporters approach these expenses in unison the expenses towards this can be reduced reasonably. Alternatively, the logistics experts engaged by the wind turbine companies can directly get in touch with these expenses and direct contact with RTOs that

would reduce the expenses drastically from the present level. This unconventional approach also would reduce the logistics cost towards transportation of wind turbines to the wind farms.

Hire Specialised Vehicles from the Outsourced Contractors

At the present juncture, wind companies engage the hired vehicle to deliver a component to their wind farm but end up of paying for both ways. If wind companies collaborate themselves and align their planning, they can get the reduced freight rates by engaging one way to one company and to return load from another company. This way, the transporters would get round trip and the benefited transporters would pass on the benefits to the wind companies. This way all would get shared benefits and expenses towards transportation would drastically come down.

Multiple Small Transport Vendors

Wind industry needs multiple small transport vendors over the few major transport vendors to transport ODC and OWC components for better cost and delivery time optimisation. The choice of having multiple small transport vendors are great advantage for wind industry to receive best personalised services, communications,



flexibility and the great prices. The development of major transporters and encouragement of few transport vendors monopolise the services and would kill the competition and encourage muscle flexing and also shoots up the freight rates and doing great disservice to the wind industry. It is proven fact that encouraging multiple transport vendors would bring innovation in service and great price advantage.

Arranging Finance through Banks

Wind Industry on their own or through their association can influence the banks to fund the upcoming transport entrepreneurs to purchase the specialised trailers, so as to get best freight rates and exclusive and assured services

Wind industry can purchase the specialised trailers and outsource the Freight Management to get extremely low freight rates, depreciation benefits and assured Transport Services. Wind industry can implement another innovative idea of purchasing the specialised trailers and to outsource Freight Management from the specialists, so as to get assured transport services throughout year, best freight rates and depreciation benefits.

Payment to the Transport Vendors

Wind industry can pay the transport vendors based on the transaction or at percentage on overall invoice or receipts. This is another way of optimising logistics cost and also to

make the vendors as partners in progress by allowing the vendors to plan for vehicles and to work in the truck market to obtain best freight rates and ensure the availability of required vehicles at all times and channelize the efforts to concentrate on core activity of manufacturing of wind components, erect and commissioning the wind turbines.

Conclusion

Wind Industry can take many unconventional steps, as cited above to reduce the logistics cost and to compress transit days to deliver the material at the required destinations. Wind turbine manufacturers can also join hands with transporters to impress and influence the government both at Centre and at State Governments about the importance of ensuring the free flow of wind turbine components movements across the nation with less human intervention and accord priority in wind turbine components clearance from check posts, RTOs across the nation, so as to have a faster wind machines delivery across India.

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