

Embracing the Challenging Scenarios in Wind Industry by downsizing the Component through dedicated research in structural components of wind turbine

27 April 2017

Presented by: SUDHANSU BHUSAN PRUSTY



© Legal Name

Contents

1.	Cost Dynamics & Why Foundation?	03
2.	Market Analysis	04
3.	Scope of Improvement	05
4.	Opportunity Cost	06
5.	Conclusion	07



COST DYNAMICS & WHY FOUNDATION?

The cost Dynamics of various turbine components



Why Foundation?

Opportunity Cost > Turn around time for design < compared to other components

Lead time for Planning <

© Legal Name



MARKET ANALYSIS

Trends in India

Installed Capacity in MW



Ministry of New and Renewable Energy sets the target for 2022 at 60GW. This means that India's target is to increase its usage of renewable and clean energy almost 2 times than current.

We are just half the way mark.

Global Trends



Figure 7.13 Cumulative Wind Power Development, World Markets: 1990-2024





Scope of Improvement

Further cost repossible througon the foundat	eduction opportunity gh dedicated resea tion!!!	y is arch	Cost reduction estimated at 50% from the current level
Optimized Design Base	d on Actual Soil Conditio	on	
	Changing the load trans	sfer Mechanism	
Site Specific Foundation		Addition of Industrial waste	
Design	Change in Foundation	in concrete	
help of FEM software can improve the recommended bearing capacity of the soil	Newer shape of the foundation can be robust & able to transfer the load more efficiently with lesser cost	Usage of composite concrete to reduce	
Foundation should be designed specific to soil condition	Changing the load path	carbon tootprint	
1	Higher pedestal height	Usage of fly ash and GGBS and advanced material can replace cement in concrete	

Moving towards precast foundation can make a paradigm Shift in installation cost of foundation



OPPORTUNITY COST

Description	Global			India			
Future Forecast of	Conc	rete	CO2 emission (in million tons)	Concrete		CO2 emission	
consumption & Emission	Volume (in Million cum)	Cost in thousand Cr.		Volume (in Million cum)	Cost in thousand Cr.	(in million tons)	
Current Design	139.5	97.65	41.8	14.5	10.08	4.3	
Future Design	62	43.4	18.6	6.4	4.48	1.92	
Change in %	55%						





CONCLUSION



Huge Potential in reduction in foundation concrete to the tune of 60% of conventional design which works out to a overall cost reduction of 33% which impacts the COE

Exponential increase in concrete qty. is curbed as we go higher hub heights.

Composites in Concrete making process reduces cement consumption to lower the heat of hydration.

Emission of CO2 has an impact on Global warming





Thank U

27 April 2017



© Legal Name

SUDHANSU BHUSAN PRUSTY, 27.04.2017