

**CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006**

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Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	<ul style="list-style-type: none">• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document.• As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at http://cdm.unfccc.int/Reference/Documents.
03	22 December 2006	<ul style="list-style-type: none">• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

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SECTION A. General description of small-scale project activity
A.1 Title of the small-scale project activity:

8.5 MW Wind Energy Project by KS Oils Limited, India
Version 1.0
Date 09/09/2007

A.2. Description of the small-scale project activity:

This is a wind energy project of capacity 8.5 MW comprising of 02 Wind Turbine Generators (WTGs) of 1.25MW each at District Dewas in Madhya Pradesh (MP) & 04 WTGs of 1.5 MW each at District Kutch in Gujarat. The electricity generated through WTGs at Dewas is wheeled to the company's manufacturing unit at Morena, MP while that produced through WTGs in Gujarat is being sold to the state grid through Gujarat Urja Vikas Nigam Ltd. The power supplied from the project activity would replace power in the respective state grid primarily based on fossil fuels combustion and hence result in reduced GHG emissions.

Wind Turbine Generators installed in the project activity are as follows –

Area	Wind Mill Cap	Power Arrangement
Madhya Pradesh	2x1.25 MW	Wheeled to the group unit through MP state grid
Gujarat	4x1.5 MW	Sold to the Gujarat state grid

KS Oils Limited, referred to as KS Oils hereafter, has business interests in the area of edible oil manufacturing. As a responsible and conscious business house, the group has chalked out a strategy to contribute towards sustainable development by investing in renewable energy sources. Wind Energy projects are environmentally positive, as there is no emission of greenhouse gases, and are completely automated in operations. The project reduces greenhouse gas (GHG) emission by reducing use of electricity generated in the Western Region (WR) Grid of India, which predominantly uses fossil fuels and has grid emission of ~ 0.90 tCO₂/MWh of electricity produced, which is being avoided through the project activity.

The project qualifies as a Small Scale CDM project activity (Renewable energy project activity with a capacity < 15 MW).

Sustainable Development:

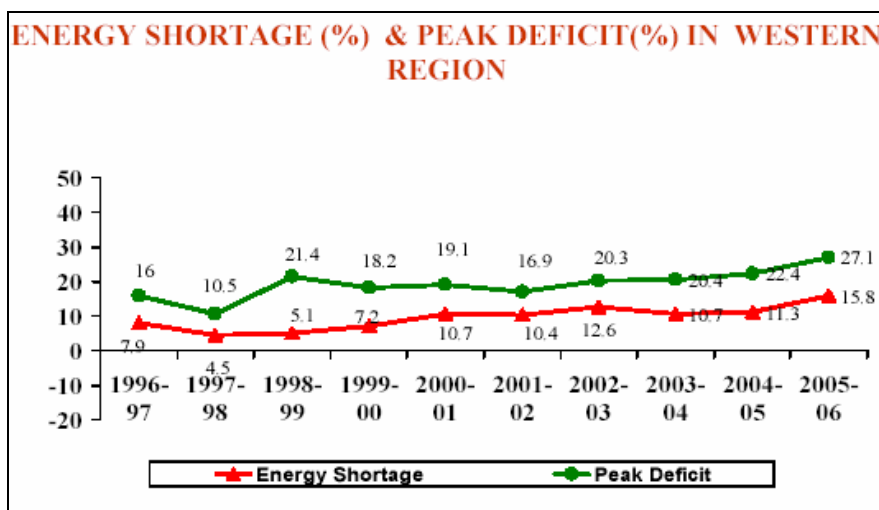
Proposed CDM project activity has following sustainable development aspects:

Social well being:

The WR grid in India faces power deficit. This is a reflection of the fact that power demand is more than power supplied in the states. The peak deficit is approximately 27%¹. The installation of project activity would help close in this gap.

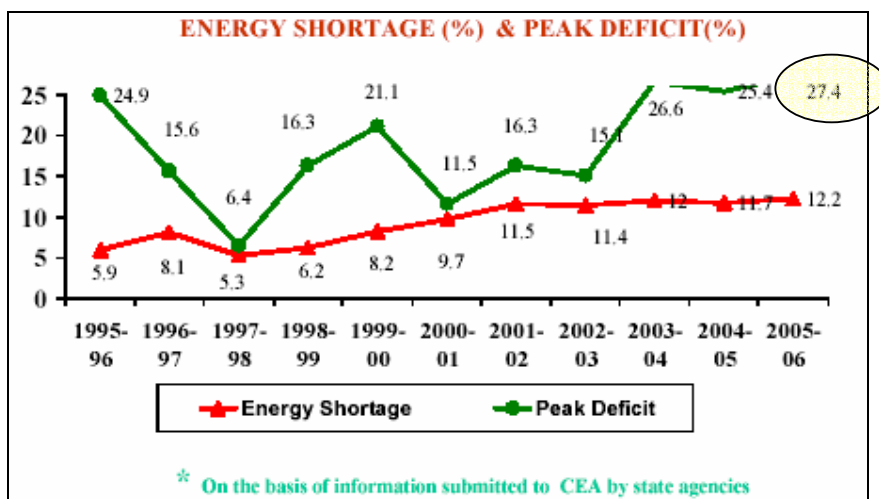
¹ [Power Sector Profile – Western Region grid](#)

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Similar situation prevails in the states of Gujarat and MP. Gujarat faces a peak deficit of ~27% and MP ~24%² as can be seen from graphs below.

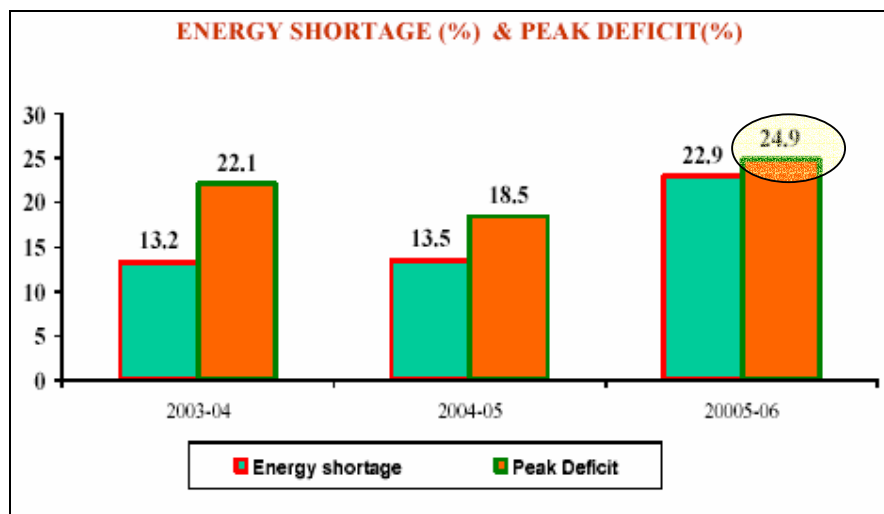
Power Demand and Supply state in Gujarat:



Power Demand and Supply state in Madhya Pradesh:

² [Ministry of Power-India \(Indian Electricity Scenario, Western Region\)](#)

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Power generation using wind-energy shall help meet power shortage in the state. It is also contributing towards Government of India's plan of meeting 10% of total power demand in the country using renewable energy sources.

Economic well being:

The project implementation would provide a fillip to economic activity in the regions of MP& Gujarat states. Direct & Indirect Employment is generated at the sites for the project implementation & management. The success of this project will encourage more business houses to invest in Wind Power projects to attain self reliance in terms of energy requirements. This further helps policy makers to possibly divert the funds, to be originally used for power sector reforms, for improvement of other sectors.

Environmental well being:

The wind energy based electricity generation leads to less fossil-fuel burning in the system and thus less GHG emissions in the atmosphere. Use of renewable energy source (wind energy) also helps in conservation of natural resources like coal, thereby contributing to energy security of the country.

Technological well being:

The technology used in the power plant is well proven and safe. Increased interest in Wind energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future. KS Oil in the project activity has also installed wind turbine generators of 1.5MW, which are new in India. Not many wind projects use WTGs of this capacity.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host Party)	KS Oils Limited (Private Entity)	No

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A.4. Technical description of the small-scale project activity:**A.4.1. Location of the small-scale project activity:****A.4.1.1. Host Party(ies):**

India

A.4.1.2. Region/State/Province etc.:

States of Gujarat & Madhya Pradesh

A.4.1.3. City/Town/Community etc.:

Village	District	State
Nagda	Dewas	Madhya Pradesh
Arikhana	Kutch	Gujarat
Suthri	Kutch	Gujarat

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

The project activity is based in Dewas in Madhya Pradesh and Kutch in Gujarat.

The two wind mills located in Dewas are at following latitude and longitude:

Wind Mill	Capacity (MW)	Site location	Latitude	Longitude
WTG 1	1.25	Nagda	N 22-53-40.7	E 76-04-41.2
WTG 2	1.25	Nagda	N 21-16-11.6	E 76-04-24.6

The four wind mills in Gujarat are at following latitude and longitude:

Wind Mill	Capacity (MW)	Site location	Latitude	Longitude
WTG 1	1.50	Arikhana	N 23-00-16.3	E 68-55-29.0
WTG 2	1.50	Arikhana	N 23-04-24.7	E 68-51-16.7
WTG 3	1.50	Arikhana	N 23-04-20.8	E 68-51-37.6
WTG 4	1.50	Suthri	N 23-04-05.2	E 68-51-39.1

The locations are depicted in the maps below –

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A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

Project Type: I–Renewable Energy Projects

Project Category: I.D. ‘Grid connected renewable electricity generation’ Version 12/ Scope 1, EB 33

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The project is a Renewable Energy project with maximum output capacity of 8.5 MW (<15 MW) this comes under the Appendix B of the simplified modalities & procedures for small-scale CDM-project activities. No transfer of technology from Annex-1 countries has taken place.

WTGs installed in the project activity are of 1.25 MW and 1.50 MW capacities. Details are given in table below -

Wind Turbine Generator Type	1.25 MW
Make	Suzlon
Rotor	
Rotor Diameter	66 m
No. of Rotor blade	03
Orientation	Upwind / Horizontal axis
Hub Height	74 m
Swept Area	3421.19 square meter
Rotational Speed	13.8 / 20.7 rpm
Rotational Direction	Clockwise
Rotor Blade Material	GRP
Regulation	Pitch –regulated
Operational Data	
Cut in wind speed	3 m/s
Rated wind speed	13 m/s
Cut off wind speed	25 m/s
Gear Box	
Type	Integrated 3 Stage 1 planetary & 2 helical
Manufacturer	Flender - Winergy
Nominal load	1390 kW
Type of cooling	Oil cooling system, Forced lubrication
Gear ratio	74.917 : 1
Generator	
Type	Asynchronous 4/6 pole
Rotational Speed	1006/1506 RPM
Rated output	250/1250 kW
Rated Voltage	690 V
Frequency	50 Hz
Insulation	Class “H”
Enclosure class	IP 56
Cooling system	Air cooled
Operating Brakes	
Aerodynamic brake	3 Independent systems with blade pitching
Mechanical brake	Spring powered disc brakes, hydraulically released, fail safe

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Yaw Drive	
Method of operation	4 active electrical yaw motors
Bearing type	Polyamide slide bearing
Wind Turbine Generator Type	1.5 MW
Make	Suzlon
Rotor	
Rotor Diameter	82 m
Cut-in Wind Speed	4 m/s
Rated Wind Speed	14 m/s
Cut-out Wind Speed	20 m/s
Swept Area	5281 square meter
Rotational Speed	16.30 RPM
Rotor Blade Material	GRP
Regulation	Pitch –regulated
Operational Data	
Cut in wind speed	3 m/s
Rated wind speed	14 m/s
Cut off wind speed	22 m/s
Gear Box	
Type	Integrated 3 Stage 1 planetary & 2 helical
Manufacturer	Winergy
Nominal load	1650 kW
Type of cooling	Oil cooling system.
Gear Ratio	95.09
Generator	
Type	Asynchronous 4 poles
Rotational Speed	1511 RPM
Rated output	1500 kW
Rated Voltage	690 V
Frequency	50 Hz
Insulation	Class “H”
Enclosure class	IP 54
Cooling system	Air cooled
Safety System	
Aerodynamic brake	3 Independent systems with blade pitching
Mechanical brake	Spring powered disc brakes, hydraulically released, fail safe
Control Unit	Microprocessor controlled, UPS back up system.
Yaw Drive	
Method of operation	4 active electrical yaw motors
Bearing type	Polyamide slide bearing

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A.4.3 Estimated amount of emission reductions over the chosen crediting period:

Years	Estimation of annual emission reductions in tonnes of CO ₂ e
2007-08	15315
2008-09	15315
2009-10	15315
2010-11	15315
2011-12	15315
2012-13	15315
2013-14	15315
2014-15	15315
2015-16	15315
2016-17	15315
Total estimated reductions (tonnes of CO₂e)	153150
Total number of crediting years	10 years fixed
Annual average of the estimated reductions over the crediting period (tonnes of CO₂e)	15315

A.4.4. Public funding of the small-scale project activity:

No Public Funding for the project activity or funding from Annex 1 or ODA is for the project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

There is no registered small-scale CDM project activity or a request for registration for another small-scale project activity:

- By the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point

It therefore satisfies all conditions listed in “Appendix C” of the simplified M&P for the small-scale CDM project activities for guidance on how to determine whether the proposed project activity is not a de-bundled component of a larger project activity”

SECTION B. Application of a baseline and monitoring methodology
B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

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AMS I.D. ‘Grid connected renewable electricity generation’, Version 12, Scope 1, EB 33

Reference: Appendix B of the simplified modalities & procedures for small-scale CDM-project activities

B.2 Justification of the choice of the project category:

The project status is in line with the methodology AMS ID; specific features of project and applicability of methodology AMS ID are discussed below-

Applicability Criteria for AMS ID	Project Status
This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	Project activity involves wind energy generating units that supply electricity to the regional distribution system (WR grid) that is supplied by a number of fossil fuel fired units.
If the unit added has both renewable and non renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component.	The project has only renewable components and the capacity is less than 15MW (8.5MW).
Combined heat and power (co-generation) systems are not eligible under this category.	The project activity is a wind energy project and is not a cogeneration system
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity is a new activity of 8.5 MW capacity.
Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	The project activity is a new activity of 8.5 MW capacity.

B.3. Description of the project boundary:

The project boundary consists of the Wind Turbine Generators (WTG), the energy metering equipments, and connected electricity grid.

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B.4. Description of baseline and its development:

Baseline for the project activity is power generated from renewable energy source multiplied by the grid emission factor of WR grid calculated in transparent and conservative manner as:

A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) as per guidelines in AMS ID.

$$CM = 0.75 \times (OM) + 0.25 \times (BM)$$

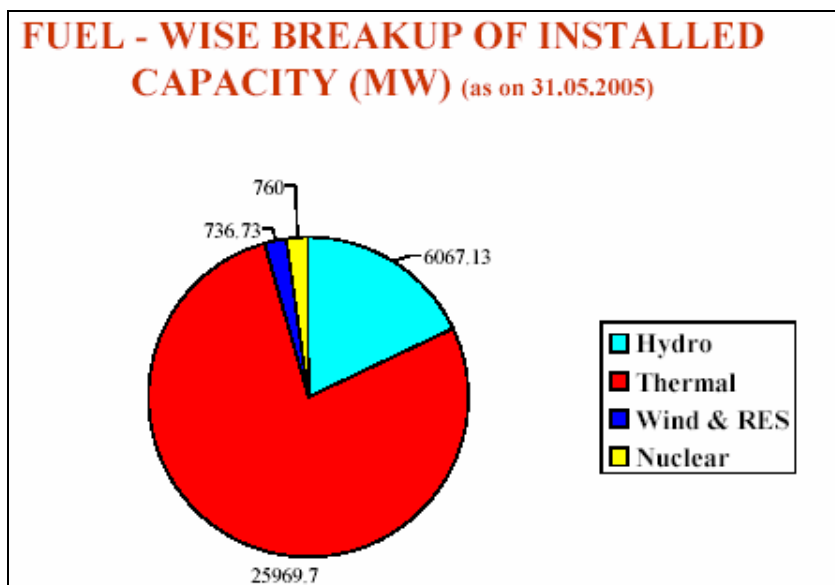
Parameter	Value	Data Source
Operating Margin (OM)	0.99	Central Electricity Authority data in accordance with ACM0002; http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf
Build Margin (BM)	0.63	
Combined Margin (CM)	0.90	

Baseline Completion Date: 02/07/2007

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

Power generation in the Western Region (WR) grid is primarily based on coal based power plants, which contributes ~77% while wind power including other non-conventional energy contribute less than 2.5% of the total annual generation in the WR grid. In the absence of the proposed project activity equivalent power would have been generated in grid connected power stations and no emission reduction would have taken place. Government of India plans to generate at least 10% of the total power generation through renewable sources of power by 2010³ and provides a number of benefits to these projects through its ministries/ departments, still it is long way to go as the projects face barriers and are not business-as-usual projects.

³ http://www.nri.org/biomass/conference_papers/policy_material_section_3.pdf



Source: http://powermin.nic.in/indian_electricity_scenario/pdf/WR0505.pdf

The project proponent has shown their interest towards environmental protection by this project as power generated using wind energy does not emit any greenhouse gases even though investment in wind power is not financially attractive and thus is a risk. However taking into account the economic value of CERs from the project activity, proponent could mitigate risks involved and have decided to go ahead with the project.

Simplified modalities and procedures for small scale CDM project activities guides to establish additionality of the project activity as per Attachment A to Appendix B. The Attachment A to appendix B mentions various barriers and requires explanation to show that the project activity would not have occurred due to at least any one barrier.

Investment barriers

The power generated in wind mills in Madhya Pradesh state is used in one of the units of KS Oil in the state alone while the power generated in wind mills at Gujarat would be sold to the state grid. The power generated in MP is wheeled to the unit using transmission network of MP Power Transmission Company Limited (MPPTCL) grid. KS OIL has come up with the project activity despite its being highly capital intensive. In this section the financial attractiveness of the project activity is tested. The project activity is divided into two parts, one that comprises of wind mills in the state of Madhya Pradesh and two those comprising of wind mills in the state of Gujarat. Two financial indicators are chosen for looking at the financial attractiveness of the project. These are Levelized Unit Cost of Energy generation (LUCE) and Internal Rate of Return (IRR) from the project activity. LUCE in the project activity is then compared to that from of alternative sources and IRR is compared to benchmark IRR on equity.

The project activity has high initial capital cost. The total investment made in this project is ~ INR 471.0 million (Rs. 55.4 million per MW of installed capacity⁴). This is higher than the capital cost investment

⁴ Capital cost of a coal based thermal power plant is ~40 million per MW and that of a diesel based generating set is ~35 million; Data Source: Central Electricity Authority

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requirement in other conventional sources of power generation. In a report from Expert Committee set up by Central Electricity Authority, Government of India, capital cost requirement in various sources of power generation has been estimated. The report suggests the capital cost for a coal based thermal power plant to be at ~Rs. 40 million and that for a DG set at ~Rs. 35 million. This is indicative of the fact the installing WTGs is more capital intensive. The effective cost per MW is even higher in the case of WTGs as capacity utilization factor is very low (22.5% in Madhya Pradesh⁵ and 23% in Gujarat⁶) compared to achievable Plant Load Factor (90%-95%) in more conventional power plants e.g. coal and liquid fuel based.

Following table shows the comparison of capital cost requirement of various available options to KS Oils:

Parameter	Wind	Coal CPP	DG set based CPP
Capital cost required – WTGs in Gujarat	Rs. 58.6 million/ MW (of installed cap)	Rs. 40 million/ MW of installed cap	Rs. 35 million/ MW of installed cap
Capital cost required – WTGs in MP	Rs. 47.7 million/ MW (of installed cap)		
Plant Load Factor (CUF in case of WTG)	22.5 % - MP 23% - Gujarat	~90%	~95%
Effective Capital Cost – Gujarat WTG	~Rs. 254.8 million/ MW of generation cap	~Rs. 44.4 million/ MW of generation cap	~Rs. 37 million/ MW of generation cap
Effective Capital Cost – MP WTG	~Rs. 212.4 million/ MW of generation cap		

Further, power generation in a WTG is considered in-firm due to its dependence on availability of suitable wind at any time. The capacity utilization may vary depending on wind availability. This is unlike conventional power sources where plant load factor is dependent on availability of fuel (coal or diesel), which anyways is not a problem in India. CUF in case of WTG may be further affected by the non-availability of grid.

Based on these factors, an estimation is done for Levelized cost of power generation from WTG and is compared with that for other power generation (coal based CPP and diesel based DG set) sources. It is also established that the unit cost of power generation from a WTG is not the most attractive one and so installation of WTGs is not the normal choice of power generation for KS Oils.

The comparison has been carried out for equivalent power generation for all options.

Parameter	Unit	Wind - MP	Coal	DG

⁵ [As per MPERC order on tariff for wind turbines](#)

⁶ [As per order on tariff by Gujarat Electricity Regulatory Commission](#)

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PLF/ CUF	-	22.5%	90%	95%
Auxiliary consumption	-	-	12%	2.5%
Capacity Installed /Required for equivalent power generation	MW	1.00	0.314	0.269
Cost of equity	Rs/ kWh	1.16	0.31	0.23
Cost of debt	Rs/ kWh	0.59	0.15	0.11
Depreciation	Rs/ kWh	1.09	0.29	0.21
Fuel cost	Rs/ kWh	0.0	1.50	6.40
O&M cost (including insurance, manpower, consumables and other expenses)	Rs/ kWh	0.25	0.26	0.17
Net power generation	MWh/annum	1971	1971	1971
LUCE without wheeling + Transmission charges	Rs./ kWh	3.09	2.49	7.12
LUCE with wheeling + Transmission charges (only applicable to WTGs as the other alternatives can be at the PP plant sites)	Rs./ kWh	3.25	2.49	7.12

As evident from the table above, the levelized cost of power generation in a WTG is not the most economical option for PP apart from its being highly capital intensive and hence is not the business-as-usual case.

In the state of **Gujarat**, the power is being sold to state grid at a certain rate as specified in the Power Purchase Agreement with MP Power Transmission Company Limited (MPPTCL). The project activity part applicable to WTGs in Gujarat has been analyzed for IRR on equity. The benchmark IRR on equity as ensured for Wind projects in the state is 14%⁷ and if the equity IRR is less than the benchmark IRR, the project activity may not be termed as financially attractive.

⁷ GERC tariff order dated 11th August 2006, copy made available.

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For estimation of IRR on equity in the project activity, following assumptions have been made:

Parameter	Value	Remarks
WTG Capacity	1.5 MW	Capacity of single WTG installed in the state of Gujarat
No of WTGs	04 nos.	
Project cost	Rs. 87.92 million	Cost of one WTG
Capacity Utilization Factor	23%	This CUF is as per the guidelines from Gujarat Electricity Regulatory Commission
Power generation	3022 MWh per annum	At 23% CUF in a single WTG
Tariff for sold power	Rs. 3.37/ kWh	As per the tariff order of Gujarat Electricity Regulatory Commission
O&M of WTG	1.5% of project cost with annual escalation of 5%	As per the tariff order of Gujarat Electricity Regulatory Commission. This includes manpower, insurance, spares etc.
Depreciation rate	4.5%	As per the tariff order of Gujarat Electricity Regulatory Commission
Tax rates	33.67%	As per Income Tax act in India
Minimum Alternative Tax	11.2%	As per Income Tax act in India
CER price	Euro 12/ CER	assumed

For estimation of IRR, tax benefit on account of faster depreciation has been considered with 80% depreciation in the first year itself. For the above values IRR on equity comes 11.4%, which is far below the IRR on equity of 14% as envisaged in tariff order of Gujarat Electricity Regulatory Authority. The project could not be termed as financially sustainable given this rate of return on equity. However, considering the benefit from CER sale accruing on account of power generated in the wind mills, IRR on equity improves to 14% and projects becomes financially tenable.

The financial returns from the project activity depend on a factor that directly affects the achievable returns. This is the Capacity Utilization Achieved during a year in the WTGs. Following is the sensitive analysis carried out on IRR on equity with changes in CUF achieved in a year.

CUF (% change)	IRR on equity	% Change in IRR	Remarks
23%	11.40 %	Base IRR	This IRR is for 23% CUF as envisaged in tariff order for wind power by Gujarat Electricity Regulatory Commission
(-5%)	10.6%	-7%	CUF is dependent on not only the performance of WTG but also on the grid availability another factor beyond the control of PP.
(-10%)	9.8%	-14%	

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(+5%)	12.2%	+7%	Still below the benchmark IRR of 14%
(+10%)	13.0%	+14%	Still below the benchmark IRR of 14%

As shown in the table above, it could be inferred that IRR on equity is not up to the desired level of 14% even after escalated CUF, which is 10% higher than the normal CUF of 23%. This is also made out that the project activity is not financially sustainable but for the benefits accruing from CER sale.

Other barriers

Wind power generation in Madhya Pradesh has not seen growth it should have. This is evident from the fact that despite special incentives, tax benefits and long term financial schemes provided by Government of India for power generation from WTG, it has not been able to realize its full potential in Madhya Pradesh as yet. As per a report from Ministry of New and Renewable Energy (MNRE), the total available potential for power generation in Madhya Pradesh from wind energy is 825 MW. However, the installed capacity is only 35.1MW, which is just about 4.3 % of the available potential. In 2000-01, Madhya Pradesh had wind power generation capacity of 22MW and in the last 5 years it could reach only up to 35.5 MW. This growth can't be termed as encouraging at all (table below) despite the “incentives” provided by government.

Year	2001-02	2002-02	2002-03	2003-04	2004-05
Installed Capacity (MW)	22	22	22	27	35.1
% Utilization of Available Potential against total potential of 825 MW	2.67	2.67	2.67	3.27	4.25

No change in wind power generation capacity took place between 2000 & 2003 and only a small improvement happened since due to barriers faced by wind energy projects in the state

(Data Source: Ministry of New and Renewable Energy's annual report of corresponding year)

Wind energy projects in the state of Madhya Pradesh have not shown encouraging progress in the past years despite the policy initiatives from central and state governments. This is reflected in poor implementation of these projects in the state as shown in the table above. Only recently some wind mills have come up in the state and they have also considered CDM benefits.⁸

Managerial Constraints

The project proponents have never ventured in such a power project activity before. They don't have prior experience for operating such projects. Though wind farms are usually developed and maintained by developers on contract basis, but lack of knowledge about functioning, monitoring and operation of wind power projects is deemed a constraint.

In the project activity, KS Oil has installed WTGs of 1.50 MW capacity. WTGs of this capacity are relatively new in India. Not many wind power plants have WTGs of such capacity. As can be seen in the table under Investment Barrier, the capital cost per MW of installed capacity for a 1.5MW turbine (Rs. 260.4 million) is more than that for a 1.25MW turbine (Rs. 207.4 million). These are state of the art technology from the manufacturer Suzlon with newly introduced systems to control and operate and require keener management practices.

⁸ <http://cdm.unfccc.int/Projects/DB/RWTUV1135356510.37/view.html>

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Summary

Thus this can be summarized that the proposed project activity is not a business-as-usual scenario as it is not the most economical option available to PP. Other problems are of high capital investment and operational barriers such as uncertain capacity utilization due to its dependence on wind availability, which is beyond the control of PP. Another risk is related to installation of high capacity wind turbine generators, which are relatively new in India. Thus the project activity is additional and project proponents seek CDM backed benefits to mitigate the risks.

B.6. Emission reductions:**B.6.1. Explanation of methodological choices:**Baseline emission:

$$BE = \text{GEN} \times \text{CM} / 1000$$

Where;

BE= Baseline emission in tCO₂/MWh

GEN= Electricity supplied by the project activity in kWh

CM= Combined margin of WR grid in tCO₂/MWhProject emissions:

There is no emission due to the project activity and hence,

Emission reduction, ER = BE-PE = BE

B.6.2. Data and parameters that are available at validation:*(Copy this table for each data and parameter)*

Data / Parameter:	CM
Data unit:	tCO ₂ / MWh
Description:	Combined Margin for WR grid
Source of data used:	Central Electricity Authority ,India
Value applied:	0.90
Justification of the choice of data or description of measurement methods and procedures actually applied :	Central Electricity Authority (India) is a government body and data published is in line with the ACM0002/ Version06, dated 19 May 2006. http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf
Any comment:	

Data / Parameter:	OM
Data unit:	tCO ₂ / MWh
Description:	Operating Margin for WR grid
Source of data used:	Central Electricity Authority ,India
Value applied:	0.99
Justification of the choice of data or description of	Central Electricity Authority (India) is a government body and data published is in line with the ACM0002/ Version06, dated 19 May 2006.

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measurement methods and procedures actually applied :	http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf
Any comment:	

Data / Parameter:	BM
Data unit:	tCO ₂ / MWh
Description:	Build Margin for WR grid
Source of data used:	Central Electricity Authority ,India
Value applied:	0.63
Justification of the choice of data or description of measurement methods and procedures actually applied :	Central Electricity Authority (India) is a government body and data published is in line with the ACM0002/ Version06, dated 19 May 2006. http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver2.pdf
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

GEN = 17016000 kWh per annum (expected net power supply from all WTGs in the project activity in a year)

GEF = 0.900 tCO₂e/ MWh

ER = 17016000 X 0.900 / 1000
= 15315 tCO₂/ annum

B.6.4 Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tCO ₂ e)	Estimation of baseline emissions (tCO ₂ e)	Estimation of Leakage (tCO ₂ e)	Estimation of overall emission reductions (tCO ₂ e)
2007-08	0	15315	0	15315
2008-09	0	15315	0	15315
2009-10	0	15315	0	15315
2010-11	0	15315	0	15315
2011-12	0	15315	0	15315
2012-13	0	15315	0	15315
2013-14	0	15315	0	15315
2014-15	0	15315	0	15315
2015-16	0	15315	0	15315
2016-17	0	15315	0	15315
Total (tonnes)	0	153150	0	153150

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of CO2 e)				
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B.7 Application of a monitoring methodology and description of the monitoring plan:
B.7.1 Data and parameters monitored:
(Copy this table for each data and parameter)

Data / Parameter:	GEN
Data unit:	kWh
Description:	Electricity supplied by WTGs in the project activity
Source of data to be used:	Electricity meter installed by respective State Electricity Board at uploading station connected to WTGs
Value of data	17016000 per annum
Description of measurement methods and procedures to be applied:	Direct reading from meter installed by respective State Electricity Board at uploading station is used for estimation of emission reduction in the project activity. Meter readings are taken jointly by respective SEB and PP.
QA/QC procedures to be applied:	These meters are the property of respective state electricity boards and calibration of the meters are carried out regularly by them.
Any comment:	

B.7.2 Description of the monitoring plan:

The project proponents have proposed a detailed procedure to ensure proper monitoring of the project activity for the purpose of CDM.

Following data is required to be monitored as part of project activity:

- Power Generation from wind mill
- Net Power supplied by the wind mill

Analysis of daily power generation, performance report and monthly meter reading is handled by project proponent on regular basis. The data collection on daily basis is done by O&M team at site. O&M team is responsible for preventive maintenance, handling emergency situations and improvement measures. O&M team ensures joint monthly reading, issuance of credit notes and meter testing on regular basis.

The project activity has installed the state of art monitoring and control equipment that measure, record, report, monitor and control various key parameters. There are tower wise meters which are used to monitor tower wise power generation data. A daily generation report is prepared which is sent to project proponent every day. Net electricity supplied is monitored using state electricity board meter. State Board personnel take reading of power generation every month; this data is used for billing purposes. This meter is maintained by state electricity board. The reading is taken in presence of O&M personnel. The meter readings of wind mills are used to prepare credit notes.

A daily log is maintained by O&M team about issues related to power generation (tower shutdown, grid failure etc).

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B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

Date of completion of the application of the baseline and monitoring methodology – 19/04/2007

Mr. Manish Goyal
 The KS OIL Limited (Also a project participant)
 Jiwaji Ganj, Morena
 Madhya Pradesh – 476 001
 India
 Phone: 91-7532-300000
 Mo: 93297 79067
 Fax: 91-7532-405060
 Email: mail@ksoils.com

SECTION C. Duration of the project activity / crediting period
C.1 Duration of the project activity:
C.1.1. Starting date of the project activity:

18/10/2005

C.1.2. Expected operational lifetime of the project activity:

20 years

C.2 Choice of the crediting period and related information:
C.2.1. Renewable crediting period
C.2.1.1. Starting date of the first crediting period:

NA

C.2.1.2. Length of the first crediting period:

NA

C.2.2. Fixed crediting period:
C.2.2.1. Starting date:

01/12/2007

C.2.2.2. Length:

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10 years

SECTION D. Environmental impacts

D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

Ministry of Environment and Forest i.e. Government of India does not require any Environment Impact Assessment (EIA) of wind mill projects. The project activity has positive impacts on environment. It results in no emission of GHGs and other gases i.e. SO_x and NO_x common in conventional power generation sources.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The project activity is a renewable energy project. Wind power projects do not negatively impact environment and are having positive environmental benefits.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

The stakeholder consultation was carried out at various levels and through different modes of consultation. For the project activity, following stakeholders were identified:

- District Authorities
- Village Panchayat
- Local Community

KS Oil through advertisements and letters sent to different authorities, informed the stakeholders about the project activity and invited views, comments and suggestions on the project activity. Also, meetings with local community were held at project sites. People were asked for their views on the project and its impact on them and their environment.

Gujarat:

KS Oil published advertisements in local language newspapers Kutch Mitra and Kutch Uday on the project activity to inform people at large, inviting their views. A meeting with gram panchayat representatives was conducted on 05/06/07 at Village Arikhana, district Kutch. Mr. Ashok Kawade addressed the meeting with a welcome note and explained how the project activity would reduce greenhouse gas emissions through the installation of wind mills in the region. He also explained the advantages the project activity has over conventional power sources. This was followed by the question-answer round. Representatives raised various queries, which Mr. Kawade suitably addressed to. Mr.

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Naranji Jadeja (panchayat representative) opined thanked KS Oil for coming up a project activity like this.

Madhya Pradesh:

A meeting was held on 13/06/07 at village Nagda, Dewas Tehsil. The meeting was attended by local councillor and other people of the area. The meeting was started by Mr. Piyush Singhal – KS Oil representative with a welcome note. He told the meeting about the greenhouse gas emissions and its impact on environment at large and efforts of KS Oil in order to cut down these emissions through the project activity. He told that in the country, primary source of power generation is still coal and combustion of coal results in emissions of carbon di oxide a greenhouse gas. The wind mills based power generation does not emit these gases. He also explained the benefits from such a project activity. After this attendees requested many questions such as its impact on rains in the region, role of the administration, approvals required from Pollution Control Board. These were answered by the KS Oil representative. The meeting was concluded with an address by Mr. Ayodhya Ghanshyam. He said that the project activity has helped in creating better environment and extended support to project activity.

E.2. Summary of the comments received:

The project activity was applauded by all and people in general appreciated the efforts by KS Oil. The project activity did not invite any negative view on it.

E.3. Report on how due account was taken of any comments received:

The project activity is a clean activity and does not result in any environmental hazard due to wind mill operation in the region.

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Annex 1**CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

Organization:	KS Oil Limited
Street/P.O.Box:	Jiwaji Ganj
Building:	-
City:	Morena
State/Region:	Madhya Pradesh
Postfix/ZIP:	476 001
Country:	India
Telephone:	91-7532-300000
FAX:	91-7532-405060
E-Mail:	mail@ksoils.com
URL:	
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last Name:	Agrawal
Middle Name:	
First Name:	Sanjay
Department:	
Mobile:	91-9300004224
Direct FAX:	91-7532-405060
Direct tel:	91-7532-405051-57
Personal E-Mail:	sanjay@ksoils.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

- No Public Funding from Annex 1 countries for the project activity.
- No ODA Funding for the project activity.

Annex 3**BASELINE INFORMATION**

Baseline information has been taken from the annual report of Central Electricity Authority⁹, Government of India. This report is inline with the approved consolidated methodology ACM0002/Version06 dated 19 May 2006.

Following table gives information of OM & BM for the WR grid:

OM, Operating Margin	0.99
BM, Build Margin	0.63
CM, Combined Margin	0.900

Unit: tCO₂e/ MWh

⁹ [CO2 Baseline Database for the Indian Power Sector](#)

Annex 4

MONITORING INFORMATION

Please refer section B.6.2 of this document for details.

Gujarat State:

In Gujarat, KS Oil has come into agreement with Gujarat Urja Vikas Nigam Limited for the sale of power generated in the project activity. Following is the excerpts from the agreement on metering, billing and maintenance of measuring equipments at site.

- 5.3 For each KVARH drawn from the grid, the Company shall pay at the rate of as determined by the Commission to GETCO from time to time for each KVARH drawn.
- 5.4 Till the Intra- State ABT is implemented, the certificate issued by GEDA for Generation Share of wind turbine shall be acceptable for monthly energy bill. The other provisions of Intra-State ABT and Open Access Regulations appearing in this agreement shall also be applicable only after the Intra- State ABT is implemented.

ARTICLE 6

BILLING AND PAYMENT

6.1 Billing Provision.

The Billing will be on monthly basis. The GUVNL will be billed by the Power Producer based on joint meter reading as certified by SEA of Gujarat SLDC following the end of each month for the energy supplied and payment will be due on the thirtieth day following the delivery of the billing invoice.

- 6.2 **Payment:** GUVNL shall make payment of the amounts due in Indian Rupees within thirty (30) days from the date of receipt of the Tariff Invoice by the designated office of the GUVNL.

6.3 Late Payment:

For payment of Monthly bill by GUVNL, if paid after Due date of Payment, a late Payment charge shall be payable by GUVNL to the Power Producer at the rate of two (2) percent in excess of the SBAR per annum, on the amount of outstanding payment, calculated on a week or part thereof basis viz.

$$= \frac{(\text{SBAR} + 2\%)}{52} \text{ per week or part thereof.}$$

6.4 Rebate:

For payment of Monthly Bill by GUVNL, if paid before Due Date of Payment, a Rebate shall be deducted by GUVNL at the rate of two (2) percent in excess of the applicable SBAR per annum, on the amount paid before due date, calculated on a week or part thereof basis viz.

$$= \frac{(\text{SBAR} + 2\%)}{52} \text{ per week or part thereof.}$$

6.5 Letter of Credit:

- 6.5.1 GUVNL shall establish and maintain irrevocable and unconditional revolving Letter of Credit in favour of, and for the sole benefit of, the Power Producer for the contracted capacity of 5 MW and above capacity. All the cost incurred by GUVNL for opening, maintenance and other cost related to establishment of Letter of Credit shall be borne by the Power Producer.
- 6.5.2 The Letter of Credit shall be established in favour of, and issued to, the Power Producer on the date hereof and made operational thirty (30) days prior to the Commercial Operation Date of the Project and shall be maintained consistent herewith by GUVNL and all times during the Term of the Agreement.
- 6.5.3 Such Letter of Credit shall be in form and substance acceptable to both the Parties and shall be issued by any Scheduled Bank and be provided on the basis that:
- In the event a Tariff Invoice or any other amount due and undisputed amount payable by GUVNL pursuant to the terms of this Agreement is not paid in full by

GUVNL as and when due, the Letter of Credit may be called by the Power Producer for payment of undisputed amount.

- (ii) The amount of the Letter of Credit shall be equal to one month's projected payments.
- (iii) The GUVNL shall replenish the Letter of Credit to bring it to the original amount within 30 days in case of any valid drawdown.

6.5.4 The Letter of Credit shall be renewed and/or replaced by the GUVNL not less than 60 days prior to its expiration.

6.5.5 Payment under the Letter of Credit: The drawl under the Letter of Credit in respect of a Tariff Invoice shall require:

1. a copy of the metering statement jointly signed by the official representatives of both the Parties, supporting the payments attributable to the Delivered Energy in respect of such Tariff Invoice.
2. a certificate from the Power producer stating that the amount payable by the GUVNL in respect of such Tariff Invoice has not been paid and disputed by the GUVNL till the Due Date of Payment of the Tariff Invoice.

Disputes: In the event of a dispute as to the amount of any Tariff Invoice, GUVNL shall notify the Power Producer of the amount in dispute and GUVNL shall pay the Power Producer 100% of the undisputed amount plus 85% of the disputed amount within the due date provided either party shall have the right to approach the GERC to effect a higher or lesser payment on the disputed amount. The Parties shall discuss within a week from the date on which GUVNL notifies the Power Producer of the amount in dispute and try and settle the dispute amicably. Where any dispute arising out of or in connection with this agreement is not resolved mutually then such dispute shall be submitted to adjudication by the appropriate Commission under Section 79 or 86 of Electricity Act 2003 and the appropriate Commission may refer the matter to Arbitration as provide in the said provision read with Section 158 of Electricity Act 2003. For dispute beyond the power confirm upon the appropriate Commission, such dispute shall be subject to jurisdiction of High Court of Gujarat. If the dispute is not settled during such discussion then the payment made by GUVNL shall be considered as a payment under protest. Upon resolution of the dispute, in case the Power Producer is subsequently found to have overcharged, then it shall return the overcharged amount with an interest of SBI medium term lending rate per annum plus 2% for the period it retained the additional amount. GUVNL / Power Producer shall not have the right to challenge any Tariff Invoice, or to bring any court or administrative action of any kind questioning/modifying a Tariff Invoice after a period of three years from the date of the Tariff Invoice is due and payable.

ARTICLE 7

METERING AND COMMUNICATION

7.1 Reading and Correction of Meters

- (i) The GETCO and the power producer shall jointly read the Metering System on the first (1st) day of every month at the Delivery Point
- (ii) In the event that the Main Metering System is not in service as a result of maintenance, repairs or testing, then the Backup Metering System shall be used during the period the Main Metering System is not in service and the provisions above shall apply to the reading of the Backup Metering System.
- (iii) Meter reading taken jointly at the appointed date and time will be signed by the representatives of the GUVNL, GETCO and the Power Producer. If Power Producer's representative is not present, then the GETCO shall provide the Power producer with a signed copy of the meter reading of the Main Metering System or Back up Metering System as the case may be. Such meter readings shall be treated as the accurate and final measurement, unless proved otherwise, of the energy supplied to the GUVNL by the Power Producer for the preceding month for the purpose of payment.

For K. S. Oils Limited

7.2 Sealing and Maintenance of Meters.

- (i) The Main Metering System and the Backup Metering System shall be sealed in the presence of representatives of Power Producer and GETCO.
- (ii) When the Main Metering System and/or Backup Metering System and/or any component thereof is found to be outside the acceptable limits of accuracy or otherwise not functioning properly, it shall be repaired, re-calibrated or replaced by the Power Producer and/or the GUVNL/GETCO at Power Producer's cost, as soon as possible.
- (iii) Any meter seal(s) shall be broken only by the GETCO's representative in the presence of Power Producer's representative whenever the Main Metering System or the Backup Metering System is to be inspected, tested, adjusted, repaired or replaced.
- (iv) All the main and check meters shall be calibrated every six month.
- (v) In case, both the main meters and check meter are found to be beyond permissible limit of error, both the meters shall be calibrated immediately and the correction applicable to main meter shall be applied to the energy registered by the main meter at the correct energy for the purpose of energy account/ billing for the actual period during which inaccurate measurements were made, if such period can be determined or, if not readily determinable, shall be the shorter of:
 - a. the period since the immediately preceding test of the relevant Main meter, or
 - b. one hundred and eighty (180) days immediately preceding the test at which the relevant Main meter was determined to be defective or inaccurate.

7.3 Records

Each Party shall keep complete and accurate records and all other data required by each of them for the purposes of proper administration of this Agreement and the operation of the Power Plant. Among such other records and data, the Power Producer shall maintain an accurate and up-to-date operating log at the Power Plant with records of:-

- a. Fifteen minutes logs of real and reactive power generation, frequency, transformer tap position, bus voltage(s), Main Meter and Back up Meter readings and any other data mutually agreed ; Till the Intra-State ABT is implemented the details under this clause shall be maintained half hourly basis instead of 15 minutes.
- b. any unusual conditions found during operation/ inspections;
- c. chart and printout of event loggers, if any, for system disturbances/ outages.
- d. All the records will be preserved for a period of 36 months.

ARTICLE 8**FORCE MAJEURE****8.1 Force Majeure Events:**

- (a) Neither Party shall be responsible or liable for or deemed in breach hereof because of any delay or failure in the performance of its obligations hereunder (except for obligations to pay money due

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Madhya Pradesh:

Similarly wheeling agreement is in place with Madhya Pradesh Paschim KVV Company Limited. The excerpts of the agreement on meter reading, recording, checking and calibration are as below –

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6.1 Installation of meter shall be done at the interconnection point as per the scheme approved by MPTRANSCO/ WEST Discom and as prescribed under State Grid Code/ Distribution Code/ Open Access Regulation and Balancing and Settlement Code notified by the Commission.

6.2 MONTHLY METER READING

The monthly meter readings shall be taken jointly and acknowledgement thereof shall be signed by the authorized representatives of WEST DISCOM & M/s K.S.Oils Ltd, at or as near as practicable on the last day of each calendar month or at any other agreed time. If any party fails to attend the joint meter reading at the agreed time, the readings of the party, which conducts the reading, shall be conclusive for the purpose of this Agreement, provided that the results of such reading be provided to the other party, which shall be certified by an officer of the party conducting the meter reading. The joint meter readings shall be submitted by West Discom to the registered office of SLDC, Jabalpur/CENTRAL DISCOM on or before 3rd day of each month.

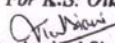
6.3 ENERGY SHARING AT COMMON METERING POINT


Two separate meters would be provided on 33 KV side of the metering point i.e. at interconnection point for measurement of total energy exported and imported, one for export of power generated by the wind generating units for being fed into Distribution Licensee's system and one for import of (active and reactive) power from Distribution Licensee's system. These meters shall be of 0.2 accuracy class and ABT compatible. If there are more than one generating company at the same site, each company shall agree with similar arrangements for registering import and export of energy (active and reactive). Where a single electronic meter capable of recording export as well as import of active and reactive energy is provided, it shall be programmed to record export of active energy and import of active and reactive energy. Further, metering on individual wind generating units is required to be done and a record of individual generating unit shall be maintained by the respective companies. The Distribution Licensee shall install & maintain the billing meters with its allied equipments at owner's cost and metering on individual WEGs owners shall be installed at the cost of the individual Companies. The Distribution Licensee may install an Export/Import meter of appropriate accuracy class at the nearest 132/33 KV or 33/11 KV substation for recording the net energy fed in to the Licensee's distribution system at their cost, which may serve as Check Meter.

Accordingly the credit/sale to utility/ sale to third party, as the case may be shall be given to individual WEG companies. The reactive (RKVAh) power shall also be distributed similarly amongst all the WEG companies.

6.4 INSPECTIONS AND SEALING

All the meters shall be jointly inspected and sealed with a seal owned by each party and shall not be opened, calibrated or tested except in the presence of the representatives of both Parties; Provided that, if West DISCOMs gives the M/s K.S.Oils Ltd. not less than one weeks prior notice (or where, due to the

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 For K.S. Oils Ltd,

 Authorized Signatory


 Chief Engineer (Commercial)
 M.P. Pachism Kshetra V.V. Co. Ltd.
 INDORE (M.P.)

requirements of this Agreement or any other event or circumstances, it is necessary for such opening, calibration or testing to be carried out within any shorter period, such prior notice as shall be reasonable in the circumstances) that any such meter is to be opened, calibrated or tested, and M/s K.S.Oils Ltd. does not attend such opening, calibration or testing, then the West DISCOM may proceed with such opening, calibration or testing without the presence of M/s K.S.Oils Ltd.

6.5 DIFFERENCE IN ENERGY RECORDED BY MAIN & CHECK METERS

If the electrical energy computed from the main meter(s) in any month differs from the readings of the concerned check meter(s) by more than $\pm 2.0\%$ both the meters shall be tested as per ISS. If on such testing the main meter error is found to exceed specified limits prescribed in the standards, the electrical energy recorded by the main meters for the month(s) concerned shall be revised accordingly, and the main meters shall be recalibrated or replaced by correct meters. Pending results of such testing, energy accounting shall continue to be based on the energy recorded by the main meters, subject to revision in subsequent month as per result.

6.6 ERRORS IN MAIN METERS BUT NOT IN CHECK METERS

Where the yearly check or any intermediate checking indicates errors in the Main Meters beyond the permissible limit but no such error is noticed in the Check Meters, billing for the month will be done on the basis of the Check Meters and Main Meters will be immediately repaired and recalibrated.

6.7 ERRORS IN BOTH THE MAIN METERS AND CHECK METERS

If during the yearly test/checks or any intermediate checking the errors in both the Main Meters and the corresponding Check Meters are found to be beyond permissible limits, the Main Meters and the Check Meters shall be immediately repaired and recalibrated and a correction agreed to between the Parties will be applied to the monthly meter reading of the main meters to arrive at the correct energy for billing purposes for the period of the Month up to the time of such test repairs and recalibration. Billing for the period thereafter until the next monthly meter reading shall be as per the calibrated Main Meter.

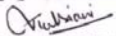
6.8 YEARLY CHECKS


All meters shall be checked/tested for accuracy yearly in presence of both parties and shall be treated as working satisfactorily so long as the errors are within the limits prescribed for meters of the specific class. Meter readings of the Main Meters will form the basis of billing, so long as the yearly checks thereof show that errors if any are within the permissible limit. If the Check Meters are found to be defective during the yearly checks the fault will be rectified and they will be immediately calibrated or replaced.

6.9 CORRECTION OF METER ERROR

For K. S. Oils Limited

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Authorized Signatory


Chief Engineer (Commercial)
M.P. Pachism Kshetra V.V. Co. Ltd.
INDORE (M.P.)

For the purpose of corrections to be applied, the meter shall be tested as per the applicable standards. The error at the load and power factor nearest to the average monthly load served at the point during the testing shall be taken as the error to be applied for correction during the period for which correction is required. For the purpose of test & calibration the sub-standard (SS) meter calibrated & sealed by authorized by National Accreditation Board of Testing Laboratory (NABL) shall be utilized. This SS meter shall be calibrated once in every TWO years at the abovementioned Meter Testing House/Laboratory.

6.10 CORRECTION OF METER

All the periodical checks and calibration shall be conducted in the presence of authorized representatives of West DISCOM/TRANSCO and M/s K.S.Oils Ltd. and results/corrections implemented shall be applicable & binding on both parties. The meters shall be jointly sealed after each calibration or when the seal is broken on mutual consent of the parties.

6.11 RECORDS

West DISCOM and M/s K.S.Oils Ltd. each shall compile and maintain records of the meter readings, meter testing, calibration etc. Such records will be made available for inspection by either party during business hours upon reasonable advance notice.

6.12 CALIBRATION PROCEDURE

Metering system, calibration procedure and the procedure of taking the meter readings could be modified from time to time as may be decided with mutual agreement.

7. ENERGY ACCOUNTING:-

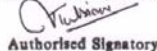
The Energy accounting will be done by SLDC & CENTRAL DISCOM as per separate agreement signed with them by M/S K.S. Oils Ltd.


8. BILLING OF WHEELING CHARGES:-

- 8.1 Bill of energy drawal (if any) from energy pool of the WEST DISCOM shall be issued separately.
- 8.2 The monthly billing of WEST DISCOM shall be the aggregate of charges payable in accordance with the provisions of this Agreement. If for certain reasons any of the charges cannot be included in the monthly invoice, such charges shall be billed in subsequent invoices as soon as possible, or by a supplementary bill.
- 8.3 If for any reason the monthly energy account is not available timely, the SLDC shall prepare the provisional energy account and accordingly the concerned accounting unit will issue a provisional bill and the M/s K.S.Oils

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For K. S. Oils Limited


 Authorised Signatory


 Chief Engineer (Commercial)
 M.P. Pachism Kshetra V.V. Co. Ltd.
 INDORE (M.P.)
