



Red Hills Wind Farm VCS Project Description

November 2008

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1 Description of Project:

1.1 Project title

Red Hills 123 MW Wind Power Project

1.2 Type/Category of the project

As a grid-connected renewable energy project, the project activity may be principally categorized under Sectoral Scope Number 1: Energy industries (renewable/non-renewable sources).

1.3 Estimated amount of emission reductions over the crediting period including project size:

The Red Hills 123MW wind farm project is expected to reduce CO₂ emissions by **2,938,386 tCO₂** during the 10-year crediting period, as described in section 4.3 of this document.

EMISSIONS REDUCTIONS	
Years	Annual estimation of emission reduction (s) in tones of CO₂
Year 1 (October 2008 - September 2009)	293,839
Year 2 (October 2009 - September 2010)	293,839
Year 3 (October 2010 - September 2011)	293,839
Year 4 (October 2011 - September 2012)	293,839
Year 5 (October 2012 - September 2013)	293,839
Year 6 (October 2013 - September 2014)	293,839
Year 7 (October 2014 - September 2015)	293,839
Year 8 (October 2015 - September 2016)	293,839
Year 9 (October 2016 - September 2017)	293,839
Year 10 (October 2017 - September 2018)	293,839
Total estimated reductions (tons of CO ₂)	2,938,386
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tones of CO ₂ e)	293,839

Table 1: Emissions Reductions

1.4 A brief description of the project:

The Red Hills wind project is located in Southern Custer and Roger Mills counties, Oklahoma, on approximately 5,000 acres of agricultural and grazing land. The project has a capacity of 123 megawatts (MW), consisting of 82 Acciona 1.5 MW turbines.

The project reached Commercial Operation on October 26, 2008 (defined as the first day that power was delivered to the Southwest Power Pool). The facility will deliver power into the Southwest Power Pool (SPP) Regional Transmission Organization (RTO) with interconnection at the Western Farmers Electric Cooperative. SPP is one

of the nine RTOs in North America. As an RTO under the Federal Energy Regulatory Commission (FERC), SPP operates the market for electricity in the Southwest United States, ensuring reliable supplies and competitive wholesale prices of power. SPP started its real-time spot market operations in early 2007, and is directly interconnected with the Midwest ISO which has been operating a market since the spring of 2005. The real-time market allows power generators to sell power into a wholesale market where it is purchased by load serving entities.

The Red Hills Wind Project's Net Capacity Factor (NCF) is projected to be 40.78%, based upon long term on-site data acquisition which commenced in September 2004. The NCF for a wind project is the actual energy output for the year divided by the energy output if the machine operated at its rated power output for every hour of the year.

The project is 100% owned by Acciona Wind Energy USA, and established as Red Hills Wind Project, L.L.C.

PROJECT OVERVIEW	
Nameplate Capacity	123 MW
Location	Southern Custer and Roger Mills Counties, OK
Commercial Operation Date	October 26, 2008
Capacity Factor / MWh per year	40.78 % / 443,400 MWh/year
Wind Study	Acciona Energía
Project Area under Lease	5,000 acres under 23 lease / easement agreements
Project Interconnection	SPP: Western Farmers Electric Cooperative, Red Hills Substation
Turbine Technology	Acciona Windpower AW-77/1500 1.5 megawatt Class II (IEC) wind turbine
Turbine Warranty	2 years

Table 2: Project Overview

The project has 100% land control for the entire project including all the turbines, substation, transmission line right-of-way, and point of interconnection. Wind leases, the transmission line and the substation are currently on thirty year terms.

1.5 Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

The project is located 10 miles north of Elk City in Western Oklahoma at grid coordinates: Latitude: 35.5°N Longitude: -99.4°W

The project is divided between two counties: 70 of the 82 turbines and the substation are located in Roger Mills County and the remaining 12 turbines and the interconnect point are located in Custer county. The project is easily accessed from Oklahoma State Highways 34 and 73.

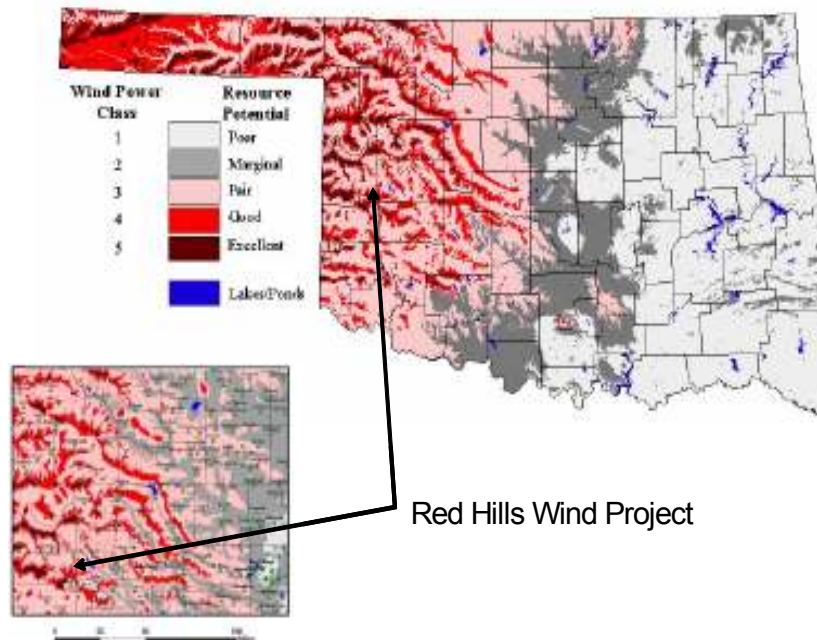
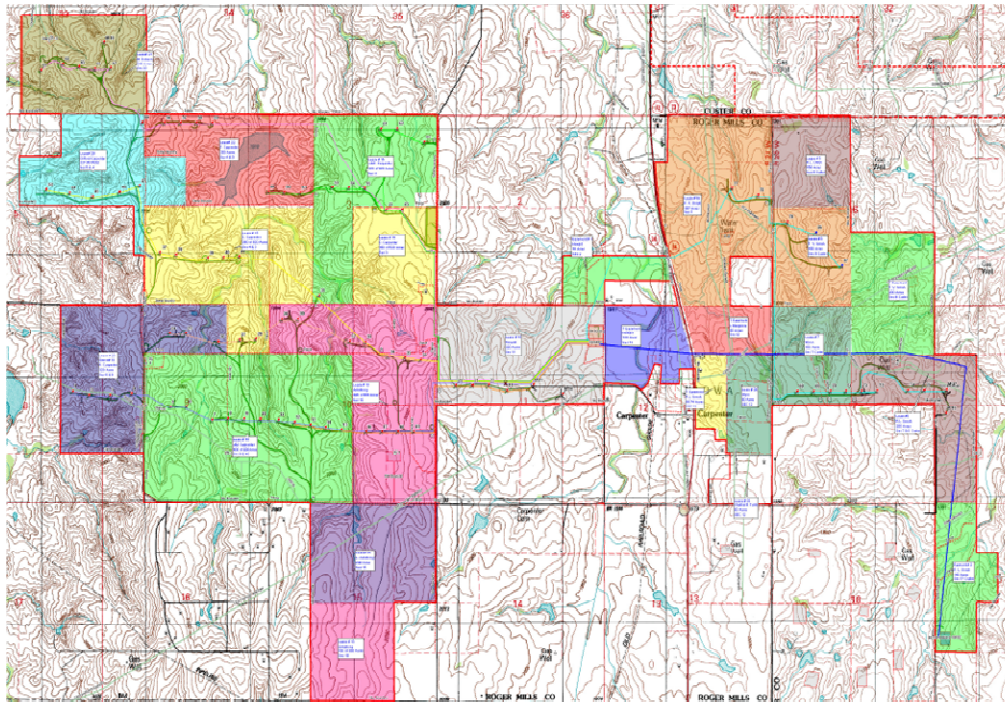


Figure 1: Red Hills 123 MW Wind Farm Location

RED HILLS LAND CONTROL MAP



(Shading indicates controlled land parcels)

Figure 2: Red Hills Land Control Map

1.6 Duration of the project activity/crediting period:

Development of the Red Hills project began in September 2006, and the approval for investment was received from Acciona Energia S.A. in April 2008, with a project activity start date of June 2, 2008. The expected operational lifetime of the project is 20 years from the starting date.

The estimated starting date of the crediting period will be October 26, 2008, for a duration of 10 years.

1.7 Conditions prior to project initiation:

The project area and adjacent properties are located in a traditionally rural region where agriculture and mineral resource extraction are the principal economic pursuits. The project property consists of separate leased parcels of land totaling an area of approximately eight square miles. Agricultural lands surround the project property in all directions and are dominated by livestock pasture with some surface water bodies in the adjacent area. While much of the project area is best suited for pasturing livestock, some level upland acreage is cultivated for wheat and cotton crops. The land is owned and will remain under the ownership of several parties for agricultural use. Socio-economic activity in the project area will remain unchanged upon completion of the wind farm construction and throughout the operational life of the farm.



Figure 3: Red Hills Wind Farm area prior to construction

1.8 A description of how the project will achieve GHG emission reductions and/or removal enhancements:

The Red Hills project activity is a zero emissions, grid-connected, electricity generation source. Wind energy is a clean energy source, and operations do not produce carbon dioxide, sulfur dioxide, mercury, particulates, or any other type of air pollution, as do conventional fossil fuel power sources. The electricity generated by the Red Hills project will displace electricity generated from existing fossil fuel plants in the Southwest Power Pool.

1.9 Project technologies, products, services and the expected level of activity:

The Red Hills wind project will consist of 82 Acciona AW-77/1500 Class IEC IIa turbines. Each turbine will have a hub height of 80 meters (m) and a rotor diameter of 77 m, for a total height of approximately 118.5 m. The turbines will be accessed by constructed project roads, and interconnected by communication and electric power collection cable within the wind farm.

The design of the AW-77/1500 was developed based on the experience gained by Acciona in the course of operating turbines manufactured by others, and the lessons learned from over ten years of operations were incorporated into the AW-77/1500 design. The Acciona AW77/1500 is a proprietary design that incorporates features such as the dual-bearing main shaft to reduce axial loads on the gearbox, internal access to the inside of the hub, and a wider nacelle enclosure to make servicing the AW-77/1500 easier and safer than servicing other manufacturer's turbines. The turbines also have noise insulation and utilize non-flammable materials. These design

elements create an unsurpassed turbine known for performance that exceeds the highest industry standards.

Key characteristics of the turbines are described in the following table.

TURBINE CHARACTERISTICS	
Nameplate Capacity	1.5 MW
Design Life	Minimum of 20 years
IEC Design	Wind Class II
Dynamic VAR Control System	General Electric LVRT technology. Each turbine will be equipped with GE's patented dynamic VAR Control capability. The standard version allows for a static setting between 0.95 lagging to a 0.95 leading power factor and can be adjusted manually.
Generation	Generation at 12,000 volts to avoid losses and transformer costs
Foundations	Dual row of bolts to guarantee better transmission loads to concrete
Main Bed Frame	Cast Iron
Dual Bearing Main Shaft	Dual bearing main shaft to reduce axial and radial loads on the gearbox
Variable Speed with Hydraulic Pitch Control for Individual Blade Actuation	Enables load reduction, maximum energy capture and guarantees control of the rotor speed, ensuring redundant and failsafe safety system control
Supervisory Control and Data Acquisition ("SCADA")	Each turbine is equipped with SCADA controller hardware, software and database storage capability
FAA Lighting	Standard FAA Lighting

Table 3: Turbine Characteristics

Each wind turbine will be connected to a pad mount transformer located at the base of the tower. The individual pad mount transformers will be interconnected in series ("Daisy Chained") with other pad mount transformers forming a series of circuits or "strings" called the collection system. The collection system (34.5 kV electrical lines) will run underground to the project substation. Here the voltage will be increased to 138 kV and then sent via an overhead transmission line to the interconnection substation at the Point of Interconnect (POI) at Western Farmers Electric Cooperative transmission line.

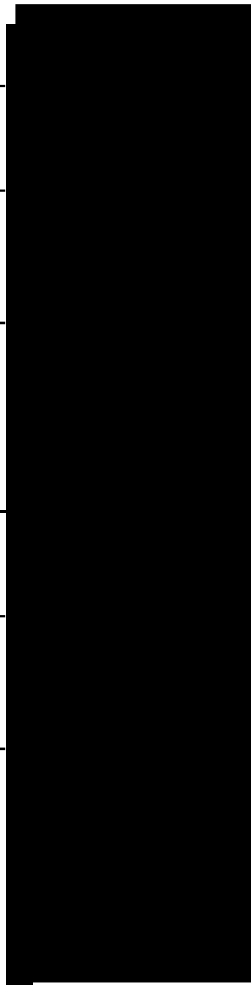
The technical specifications of the project are as follows:

TECHNICAL INFORMATION	
Turbine Type	Acciona AW-77/1500
Number of Turbines	82
Nameplate Capacity	123 MW
Rotor Type	77 meter
Average Turbine Availability	99%

Table 4: Technical Information

1.10 Compliance with relevant local laws and regulations related to the project:

The Red Hills Wind Farm is in compliance with all applicable laws and regulations. The State of Oklahoma does not have state-wide wind farm permitting requirements, leaving permitting up to individual counties. Table 5 below provides a description and status of all applicable regulatory issues.

PERMITTING STATUS				
Agency	Type of Approval	Description	Responsible Party	Status
Oklahoma Department of Environmental Quality	NPDES Storm Water General Permit for Construction Activities	OKR10 NOI – Construction General Permit Notice of Intent		Complete
	Section 401 Permit	To be submitted (concurrent w/ Section 404 application)		Complete
	On-site sewage treatment system approval	Inspection/approval for installations of on-site sewage treatment systems.		Complete
Oklahoma State Historic Preservation Office	Section 106 review	Formal 106 review is not expected to be necessary for this project.		Complete
Oklahoma Department of Transportation	Permit for Utility Lines Constructed in Road Right of Ways	Permit for crossing state public road right-of-way with electrical lines.		Complete
	Oversize/Overweight Permit	Permit from state for transport of oversize/overweight cargo.		As required
Roger Mills County	Building Permit	Permit from County for building of structures such as turbines. May also include underground electrical, overhead electrical, substation, and O&M building.		Complete

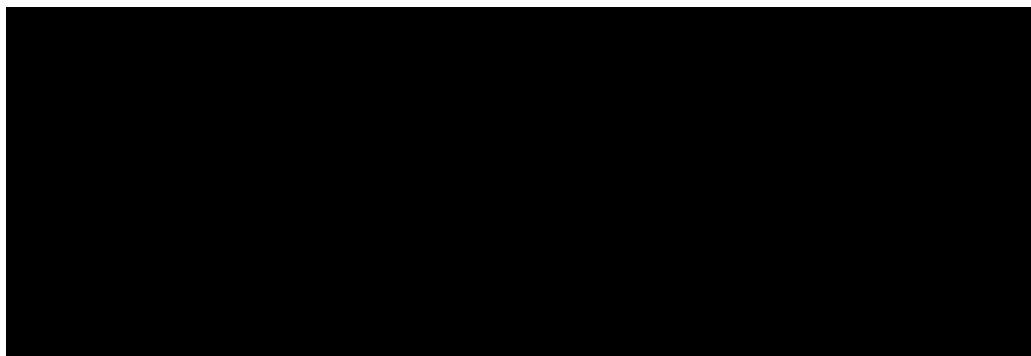
	Floodplain Permit	Permit for underground crossings in Special Flood Hazard Areas (SFHA).		Complete
	Permit for Utility Lines Constructed in Road Right of Ways	Permit for crossing county public road right-of-way with electrical lines.		Complete
	Approval from Commissioner on Roads	Road access, widening, etc. needs to be reviewed and approved by Commissioner.		Complete
Custer County	Floodplain Permit	Permit for underground crossings in Special Flood Hazard Areas (SFHA).		Complete
	Permit for Utility Lines Constructed in Road Right of Ways	Permit for crossing county public road right-of-way with electrical lines.		Not Required
	Approval from Commissioner on Roads	Road access, widening, etc. needs to be reviewed and approved by Commissioner.		Not Required
	ALTA Survey			Physical survey and review of initial title reports are complete. Title commitments are the remaining items to be added to the survey
	Environmental Studies: Avian, Phase I Environmental, Cultural Resources, and Wetlands			Field studies have been completed and draft reports have been issued for all studies
Federal Aviation Administration (FAA)	Notification of Non-Hazard to Aviation			Complete
U.S. Army Corp. of Engineers				Not Required

Table 5: Red Hills Permitting Matrix

1.11 Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements:

Public version:

There is one minor risk associated with the project which can be adequately managed and mitigated by the wind farm operator.



1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

The Red Hills wind project is a zero emissions, grid-connected electricity generation source. Wind generated electricity does not produce greenhouse gas emissions, therefore the project will reduce greenhouse gas emissions by displacing fossil fuel generation such as natural gas and coal.

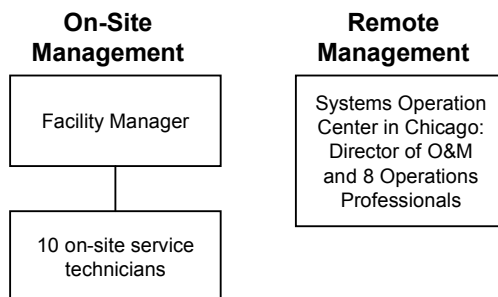
1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

As a generation source of GHG-free renewable energy, the Red Hills Wind Farm is eligible to receive voluntary Renewable Energy Credits (RECs). Although eligible, the Red Hills Wind Project does not plan to generate RECs upon generation commencement. Should this change, Acciona will take the necessary steps to assure that VCUs and RECs are not claimed for electricity generation. Acciona understands that it cannot generate carbon credits and RECs simultaneously as this is considered “double-counting” and embraces its responsibility to protect the integrity of the environmental programs to which it applies.

1.14 Project rejected under other GHG programs (if applicable):

The Red Hills Wind Project has neither applied for nor been denied acceptance under any other GHG program.

1.15 Project proponents roles and responsibilities, including contact information of the project proponent, other project participants:



PROJECT PROPONENT CONTACT	
Organization:	Red Hills Wind Project, L.L.C.
Street/P.O.Box:	333 West Wacker Dr.
Building:	Suite 1500
City:	Chicago
State/Region:	IL
Postfix/ZIP:	60606
Country:	United States of America
Telephone:	(312)673-3000
FAX:	(312)673-3001
E-Mail:	jkoop@acciona-na.com
Title:	Originator
Salutation:	Ms.
Last Name:	Koop
First Name:	Jennifer
Department:	Power Marketing
Direct Telephone	(312)673-3069
FAX:	(312)673-3001
Personal E-Mail:	jkoop@acciona-na.com

Table 6: Project Proponent Contact Information

1.16 Any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information.):

All relevant information for the eligibility of the project activity and the quantification of emissions has been provided within this project description. No additional information is necessary for the determination of project eligibility or emission reduction quantification.

1.17 List of commercially sensitive information (if applicable):

Section 1.10 (Permitting Status table)
 Section 1.11 – use “public version”
 Section 2.5, Step 2

2 VCS Methodology:

2.1 Title and reference of the VCS methodology applied to the project activity and explanation of methodology choices:

Title: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

Reference: This is an UNFCCC consolidated baseline methodology ACM0002, version 09, Sectoral scope 01.

The Red Hills Wind Project is a grid-connected wind powered electricity generation source. As such, ACM0002 - Version 09 is the appropriate methodology choice to be applied to this analysis.

2.2 Justification of the choice of the methodology and why it is applicable to the project activity:

Among the methodologies approved for grid-connected electricity generation from renewable sources, ACM0002 Version 9, Sectoral Scope 1 has been chosen as the most suitable for this project activity. The Red Hills Wind Project meets the conditions of Sectoral Scope 1 because this methodology is applicable to grid-connected renewable power generation projects.

2.3 Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

For the baseline determination, project participants calculate the total CO₂ emissions from existing fossil fuel electricity generation, and then the emissions that are displaced due to the project activity. The spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the VCS project power plant is connected to.

GREENHOUSE GAS SOURCES, SINKS, AND RESERVOIRS				
Scenario	Source	Gas	Included	Justification/Explanation
Baseline	Fossil fuel electricity generation that is displaced due to the project activity	CO ₂	Yes	Main emission source
		CH ₄	No	Not identified in the baseline methodology
		N ₂ O	No	Not identified in the baseline methodology
Project activity	Electricity generation in the project activity	CO ₂	No	Zero-emissions grid-connected electricity generation from renewable energy
		CH ₄	No	Zero-emissions grid-connected electricity generation from renewable energy
		N ₂ O	No	Zero-emissions grid-connected electricity generation from renewable energy

Table 7: Greenhouse Gas Sources, Sinks and Reservoirs

2.4 Description of how the baseline scenario is identified and description of the identified baseline scenario:

As per ACM0002 the project activity is grid connected electricity generation from renewable sources.

For purposes of determining the baseline scenario, it is necessary to define the project boundaries. According to ACM0002, grid-connected renewable energy projects must include the “connected electricity system” in the project boundary. The connected electricity system for the Red Hills Project is the Southwest Power Pool (SPP). Therefore, the geographic extent of SPP is considered the boundary for the project. All of the following were considered when assessing potential baseline candidates:

- The project description,
- Existing and alternative project types,
- Data availability, reliability, and limitations, and
- Other relevant information concerning present or future conditions.

The determination of the baseline scenario as the “continuation of the current situation without the project activity” is consistent with the baseline determination provided in ACM0002. According to ACM0002, for a project within the boundaries of SPP that does not modify or retrofit an existing electricity generation facility, the baseline scenario of the project is identified as the following: “Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-

connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described herein.”

As prescribe in the methodology ACM0002, for the proposed project, the emission reductions will be the amount of electricity supplied to the grid multiplied by the grid emission co-efficient.

This Project Description provides a discussion of the project as well as the relevant GHG sources, sinks, and reservoirs. The following alternative project types, each equivalent to the project activity, were considered in the development of the baseline scenario:

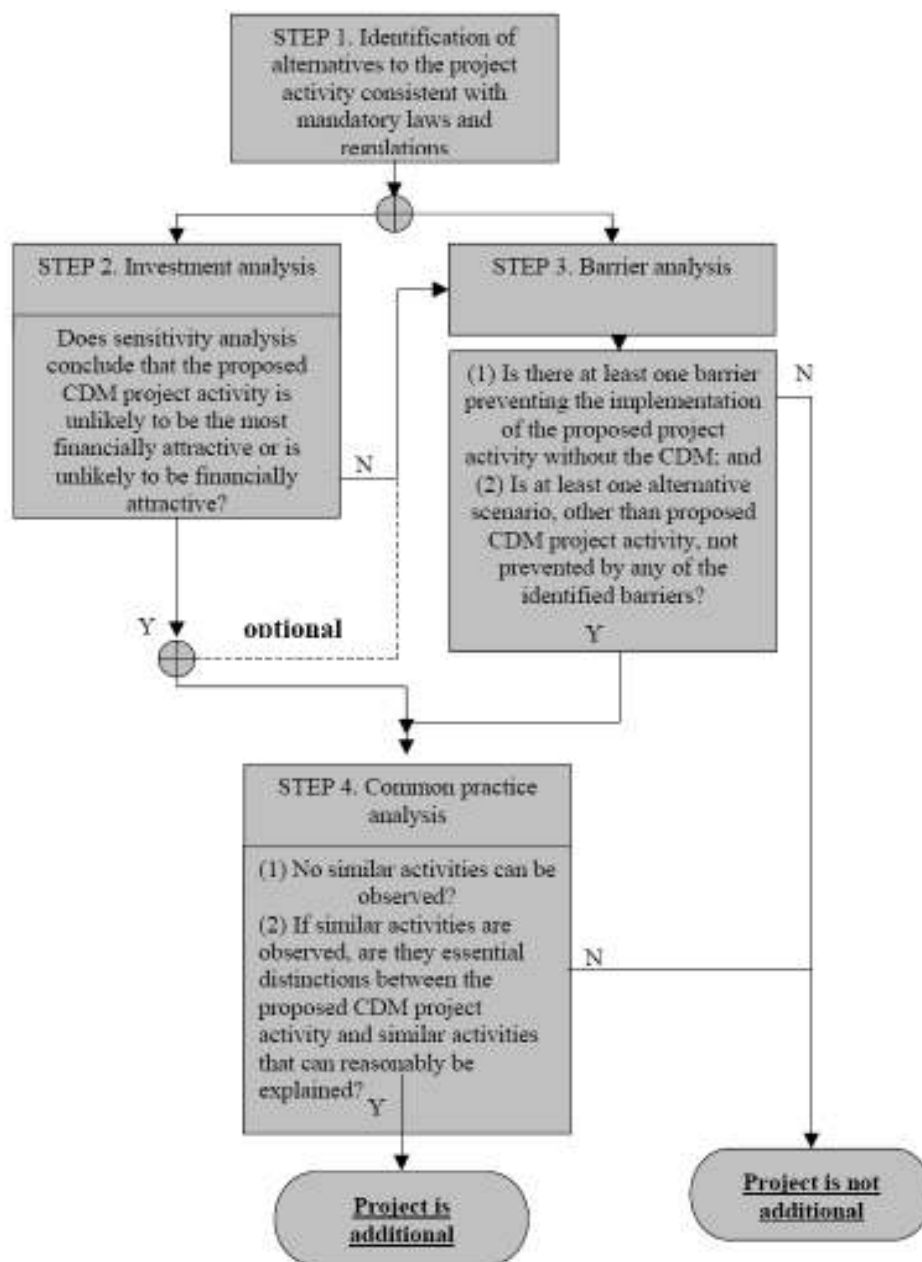
- Alternative 1: Implementation of the project activity not undertaken as a VCS project activity;
- Alternative 2: Implementation of a similar scale renewable energy project such as solar power;
- Alternative 3: Continuation of the current situation with no project activity.

Alternatives are explained in detail in section 2.5 below.

2.5 Description of how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality):

As per the selected methodology ACM0002, the project proponent is required to establish that the GHG reductions due to project activity are additional to those that would have occurred in absence of the project activity as per the ‘Tool for the demonstration and assessment of additionality.’

The flowchart presented below provides a step-by-step approach to establishing additionality of the project activity as per the consolidated tool for demonstration of additionality:



Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Define realistic and credible alternatives to the project activity through the following sub-steps:

Sub-step 1a: Define alternatives to the project activity

The following alternatives are considered:

Alternative 1. The implementation of the project activity not undertaken as a VCS project activity may be part of the baseline. However, as shown in the investment analysis (2.5. step 2), the proposed project with only energy sales income and without VCU income, is not financially attractive.

Alternative 2. The implementation of a similar scale renewable energy project such as solar power may be part of the baseline as Acciona's business objective is to generate renewable energy. However, compared to wind energy, a solar power project would be much more expensive¹ relative to the solar resource available in Oklahoma² and therefore, the project would not be financially attractive for potential investors.

The necessary data required to assess each of these alternatives is readily available. Alternatives 1 and 2 are both considered zero emissions activities by ACM0002, and the relevant data to determine the grid emissions factor for Alternative 3 as per the ACM0002 requirements is available. To identify and justify the appropriate baseline scenario, relevant information concerning regulatory requirements and the concept of "common practice" (a complete common practice discussion is provided in section 2.5) should be determined.

Alternative 3: Continuation of the current situation with no project activity. In this alternative, project activity is not implemented resulting in the continued current grid mix of the SPP i.e. the equivalent amount of energy would have been produced by the project grid electricity system through it currently running power plants and by new capacity additions. Equivalent amount of carbon dioxide would be generated at the thermal power generation end predominantly by fossil fuel based power plants.

Sub-step 1b: Consistency with mandatory laws and regulations:

The alternatives shall be in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions

Based on the assessment of regulatory requirements, each of the identified alternatives (1, 2, and 3) is equivalent. There are currently no regulatory requirements that compel the implementation of either Alternative 1 or Alternative 2 (such as a state Renewable Portfolio Standard) in Oklahoma. Given continued production, electrical generation activities under Alternative 3 are reasonably assumed to be in compliance with relevant laws and regulations.

The project is not mandated by any enforced law, statute, or other regulatory framework and therefore adheres to the requirements in step 1.

Based on this analysis, Alternatives 1 and 2 do not represent the most plausible scenario in the absence of the project activity. Therefore, Alternative 3 represents the most likely scenario should the project not be implemented and is chosen as the baseline scenario.

¹ See "Energy Technology Perspectives 2008" IEA for guidance on renewable technology costs. The range for Concentrated Solar Power is 125-225 US\$/MWh

² <http://www.nrel.gov/gis/solar.html>

Step 2: Investment analysis

Sub-step 2a: Determine appropriate analysis method

As per the Tool for demonstration and assessment of additionality, simple cost analysis is not applicable as the project activity sells electricity to the grid and obtains economic benefits in the form of electricity tariffs.

Hence, there is the option of using either Option II- Investment comparison analysis or Option III Benchmark analysis. **Option III – Benchmark analysis** was chosen. The required Project IRR for renewable energy projects serves as a benchmark to assess the financial attractiveness of the project activity.

Sub-step 2b: Option III - Apply benchmark analysis

An investment analysis of the project activity was conducted with the Project IRR as the financial indicator (benchmark) vis-à-vis the Required Project IRR for Renewable Energy Projects.

A wind project has three main options in selling the renewable energy that it generates:

1. **Market Sales:** Selling into the real-time market and taking the market price
2. **Market Hedge:** Selling into the real-time market, combined with a financial or physical hedge (such as a swap, floor, or collar) to reduce some price risk
3. **PPA:** A Power Purchase Agreement (PPA) with a utility or other load supplier

Each of these options has been evaluated.

1. Market Sales

In the first option, selling the power on the SPP merchant market without a long term contract in place is a risky strategy. Hourly average spot prices in the SPP Western Farmers Electric Cooperative (where Red Hills is located) ranged from negative (\$58) to \$537 over the first year of the real time spot market operation.

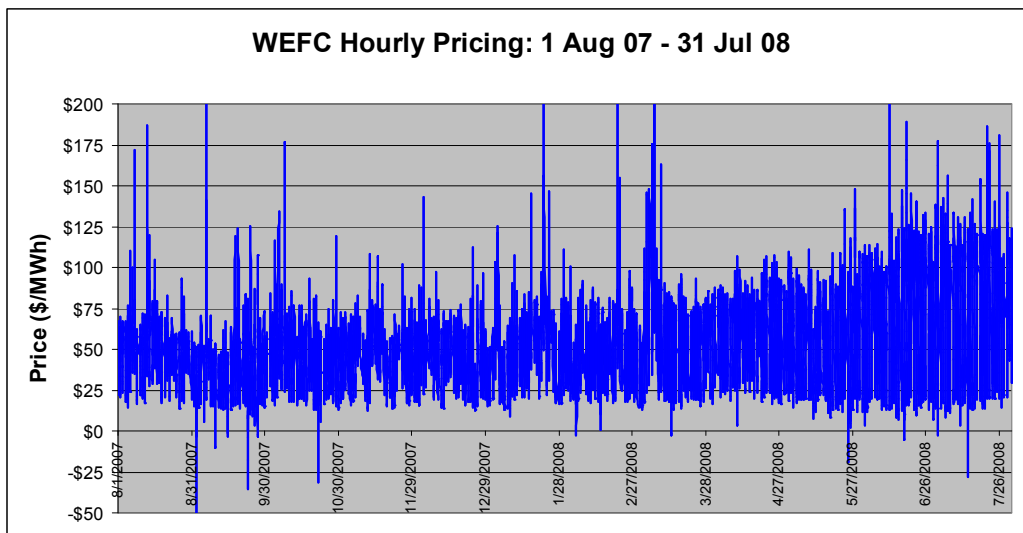


Figure 4: WEFC Hourly Pricing

This significant volatility makes the revenues from selling power into the market very unstable. Red Hills would not be able to secure the tax equity financing because lenders will be less certain of future project revenues.

2. Market Hedge

The second option for Red Hills is a market hedge in which a counterparty structures a transaction (such as a swap or a floor) in which the power is sold into the market, but the project is provided with a more stable cash flow, often required by investors.

There is very limited, if any, interest in offering hedges to wind farms in SPP today, primarily based on market liquidity. The real-time market, similar to a spot market for wholesale electricity, in SPP began in January 2007. Given the immaturity of this market, it is characterized by volatile pricing, illiquidity, and, in general, high risk in comparison to other more established competitive power pools.

ISO MARKET COMPARISON			
ISO	Installed Capacity	# of Members	Market Characteristics
SPP	44,343 MW	46	Real Time Market
MISO	136,400 MW	92	Real Time & Day Ahead Markets, Commercial Trading Hubs
PJM	165,200 MW	450	Real Time & Day Ahead Markets, Commercial Trading Hubs

Table 8: ISO Market Comparison

Given these market conditions, it is difficult to secure a physical or financial hedge in SPP. Reliable market liquidity is usually required for a counterparty to structure a hedge and it is lacking in SPP. Acciona approached almost ten financial institutions and power marketers, and none were willing to provide a hedge in that region.

3. PPA

To evaluate the third option, entering into a PPA, a survey of the market for such contracts in Oklahoma is required. Of the 7 wind projects that have come online to date, Sleeping Bear Wind Project LLC (Sleeping Bear) PPA information was used because it is the closest information available for a project of similar characteristics in Oklahoma. The other projects are either from an earlier time period when market characteristics were very different, are of a different size, or were contracted under a Build-Operate-Transfer (BOT) agreement instead of a PPA. At the time of preparation of this Project Description, Sleeping Bear pricing was the most relevant information available for comparison from the FERC Electric Quarterly Reports database.³

³ <http://www.ferc.gov/docs-filing/eqr.asp>

Project Name	Year online	Capacity (MW)	Developer	Power Purchaser	Arrangement
Blue Canyon	2003	74.25	Zilkha Renewable/Kirmart Corp.	Western Farmers' Electric Cooperative	PPA
Oklahoma Wind Energy Center - A & B	2003	102	FPL Energy	Oklahoma Municipal Power Authority, Oklahoma Gas & Electric	PPA
Blue Canyon II	2005	151.2	Horizon Wind Energy	American Electric Power	PPA
Weatherford Wind Energy Center	2005	147	FPL Energy	American Electric Power	PPA
Centennial Wind Energy Project	2006	60	Chermac Energy/Invenergy	Oklahoma Gas & Electric	BOT
Sleeping Bear	2007	94.5	Chermac Energy Corp./Edison Mission Group	AEP - Public Service of Oklahoma	PPA
Centennial Wind Energy Project (2007)	2007	60	Chermac Energy/Invenergy	Oklahoma Gas & Electric	BOT

Figure 5: Wind Projects in Oklahoma

Sleeping Bear Wind Project LLC (Sleeping Bear), is a 94.5 MW wind project located near Fort Supply in Harper County, Oklahoma. Sleeping Bear contracted to sell power to Public Service of Oklahoma (PSO) commencing on October 29, 2007 for 25 years per the following price structure:

SLEEPING BEAR-PSO PPA PRICING	
Off Peak Month / Off Peak Hrs (\$/MWh)	22.23
Peak Month / Off Peak Hrs (\$/MWh)	23.37
Off Peak Month / Peak Hrs (\$/MWh)	33.06
Peak Month / Peak Hrs (\$/MWh)	37.62
Peak Month / Super Peak Hrs (\$/MWh)	50.16

Table 9: Sleeping Bear-PSO PPA

An analysis was done to estimate the returns in the Red Hills project based on this price structure. Applying the above per MWh prices to Red Hills expected production yielded a volume-weighted average price of \$29/MWh. Since the Sleeping Bear-PSO PPA started in October 2007, the price needed to be escalated to reflect an expected PPA price when the Red Hills project will be completed. The escalation rate was calculated to approximate the average increase in electricity prices over the time period (October 2007 to January 2009). Electricity prices in the SPP market increased by an average of 20% and 40% annually from 2007 to 2008.⁴ This escalation rate was assumed to continue in the future, a conservative assumption given that spot prices across the country have averaged annual increases of 10%.⁵

Therefore, the \$29/MWh volume-weighted average price was escalated from October 2007 to January 2009 at an escalation rate range of 20% to 40%. The resulting prices are \$35/MWh - \$43/MWh based on the approach described above.

The PPA price was assumed to escalate at 2% per year starting one year after the PPA execution. This escalation rate is typical for PPAs, or could even be considered a high estimate, to account for the fact that a portion of the costs are subject to inflation and other variable factors.

⁴ <http://www.spp.org/LIP.asp>; spp pricing.xls

⁵ <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-2008-3yr-regional-elec-pr.pdf>

This pricing was inputted into the Acciona pro forma model for Red Hills to calculate the expected project returns. The resulting returns from using this PPA price range in the investment analysis were then compared to typical industry benchmark returns:

RED HILLS INVESTMENT ANALYSIS		
	Red Hills Returns	Benchmark
Project	4.9 – 7.0%	9.0 – 10.0%

Table 10: Red Hills Investment Analysis

Ranges have been utilized to accurately reflect the fluctuations that have been observed in the market and previous internal project activities. The required project return is a typical industry hurdle rate for renewable energy projects.⁶ As demonstrated in the above table, the project returns are insufficient to justify the development of the Red Hills project. Moreover, the returns generated would not be sufficient to satisfy investors in the project. In the calculations using the PPA price above, the tax equity returns produced by the project would not be high enough to meet tax equity required rates.

Sub-step 2c: Calculation and comparison of financial indicators.

We assume the more conservative reference situation (e.g. closer to benchmark) of Sleeping Bear PPA at 43\$/MWh and an IRR of 7.0%. Red Hills attempted to secure a PPA and was short-listed in the Western Farmers Electric Cooperative (WFEC) Request for Proposals (RFP). At the price in Red Hills' proposal, [REDACTED] the project would achieve a [REDACTED] return. During the RFP process, Red Hills' application for VCS was discussed with WFEC.

WFEC selected Red Hills for its short list and further negotiation based on its interest in renewable energy and reducing its carbon footprint (see attached letter). The final PPA price is subject to negotiation, but WFEC clearly assigned value to the VCU revenue stream in its analysis. The PPA with WFEC including the VCU revenue stream helped the project to achieve the benchmark for financial viability.

Sub-step 2d: Sensitivity Analysis.

Sensitivity to wind. There is an inherent variability in Wind Power generation from year to year, caused by the cyclic non-systematic variations in the wind patterns. As a result, it is important to carry out the effect of varying the energy production (with +/- 10% change in generation) on the Project IRR. The sensitivity range of +/- 10% on the energy production of the project is considered based on the extensive technical analysis done by Acciona itself, coupled with its global experience in project prospecting, analysis, execution, and operation over approximately two decades.

Energy Production (MWh)	Project IRR (%)
400,648 (-10% generation)	5.3
443,925 (base case)	7.0
489,680 (+10% generation)	8.7

⁶ Ventyx, Fall 2008, Capital Structure Characteristics

It is concluded that the project activity is not the most financially attractive alternative.

Step 3: Barrier Analysis

The barrier analysis was also used to show that the project activity is additional. In this step, it is required to determine whether the proposed project activity faces barriers

Sub-step 3a: Identify barriers that would prevent the implementation of the proposed VCS project activity.

- **Technological Barrier:**

Due to the remote locations of wind projects, there are barriers to getting interconnected to the transmission grid. Investments in substations, upgrades, transmission lines and other related infrastructure are often required. These are organizational barriers. Red Hills faced a cost of [REDACTED] for a substation required for interconnection.

- **Investment Barrier:**

In the United States, investments in wind projects are subsidized through tax incentives. Since the developers of these projects do not usually have a large enough tax obligation to use the tax credits themselves, they must find a tax equity investor who can utilize the tax benefit (e.g. a bank or large company) to participate in the financing of the project.

For foreign/new investors in the US, this tax financing structure is an investment barrier. The tax equity investor and the project sponsor agree that the tax equity investor will be allocated the majority of the tax benefits while the project sponsor will be allocated the cash flows until the majority of the federal Production Tax Credits (PTCs) have been used. At the end of that period of time, the two equity positions “flip” so that the flow of funds and tax benefits is reversed and the equity investor paid off. The required project return must be achieved in order to deliver the required tax equity return to the investor.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).

PTCs are Production Tax Credits related to the generation of renewable energy, so any other generation is not prevented by PTC.

A renewable energy project cannot be implemented without incentive (‘grant’), that in our case is represented by the PTC. Not being able to access the PTC (since we do not have a tax bill in the United States to be able to utilize the tax benefits) prevents the implementation of renewable energy projects, and does not prevent the implementation of ‘Continuation of the current situation’ alternative. So, the identified barrier does not prevent the implementation of at least one of the alternatives.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

According to the GHG Protocol for Project Accounting, “Common practice refers to the predominant technologies or practices in a given market, as determined by the degree to which those technologies or practices have penetrated the market (defined by a specified geographic area).”⁷

In the SPP, electricity generation is dominated by fossil fuels. Coal is the primary fuel source and is estimated to produce two-thirds to over 80% of the electrical power in the SPP⁸. Natural gas represents the largest fuel source by capacity in the SPP as it represents over 51% of the total power capacity for the SPP. At the end of 2007, wind power represented only 1% of the current on-line generation capacity for the SPP (and therefore, most likely, represents a smaller portion of total electricity generation). However, the potential for wind generation in the SPP region is estimated to be 90,000 MW, which would far exceed the peak load of 50,000 MW.⁹

Narrowing in on Oklahoma, the state has not undertaken any initiatives to support renewable energy (such as Renewable Portfolio Standards or Goals, Cap and Trade Initiatives, or State Emissions Targets) like other states have.¹⁰ Since Oklahoma is different than other states in this respect, including some states in SPP, the analysis for common practice should be demonstrated at the Oklahoma state level.

The lack of incentive for renewables has prevented Oklahoma from fulfilling its potential for wind generation, quantified in a recent report. In 2008, the U.S. Department of Energy (DOE) published a report that examines the technical feasibility of using wind energy to generate 20% of the nation's electricity demand by 2030. The report, "20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply," includes contributions from DOE and its national laboratories, the wind industry, electric utilities, and other groups. The report examines the costs, major impacts, and challenges associated with producing 20% wind energy or 300 GW of wind generating capacity by 2030.¹¹ According to this report, Oklahoma has the potential for more than 10,000 MW of wind power. In comparison, the state had only 689 MW of wind power installed at the end of 2007.

⁷ World Resources Institute and World Business Council for Sustainable Development. 2005. *The Greenhouse Gas Protocol for Project Accounting*. WRI/WBCSD, Washington, D.C.

⁸ SPP State of the Market Report 2007, Boston Pacific Company, Inc.

⁹ Southwest Power Pool

¹⁰ Source: Pew Center, http://www.pewclimate.org/docUploads/Climate101-State-Jan09_1.pdf, http://www.pewclimate.org/docUploads/AllStateInitiatives-01-27-09-a_0.pdf

¹¹ Source: <http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf>

Figure 1-8. 46 states would have substantial wind development by 2030

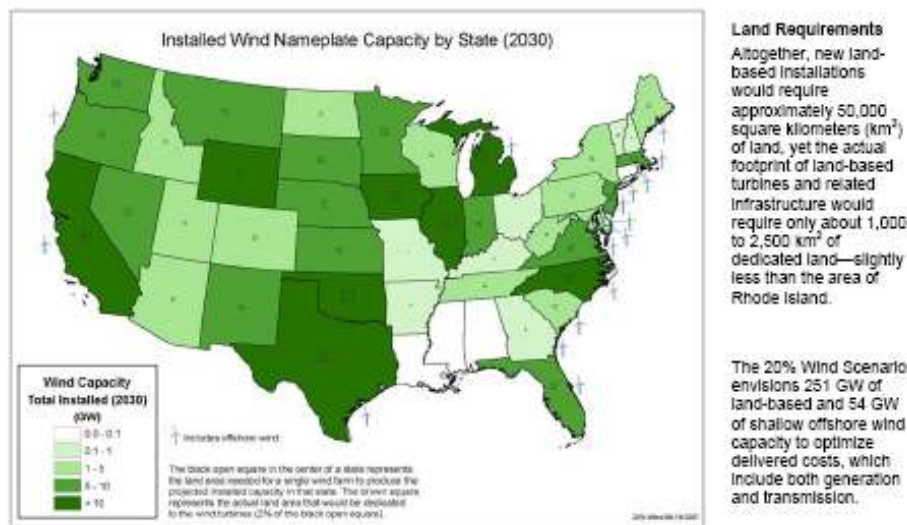


Figure 6: Wind Potential by State

In the same report, wind resource potential in USA is shown. Oklahoma again shows a great potential, especially in the western part of the state.

Figure 2-1. The wind resource potential at 50 m above ground on land and offshore

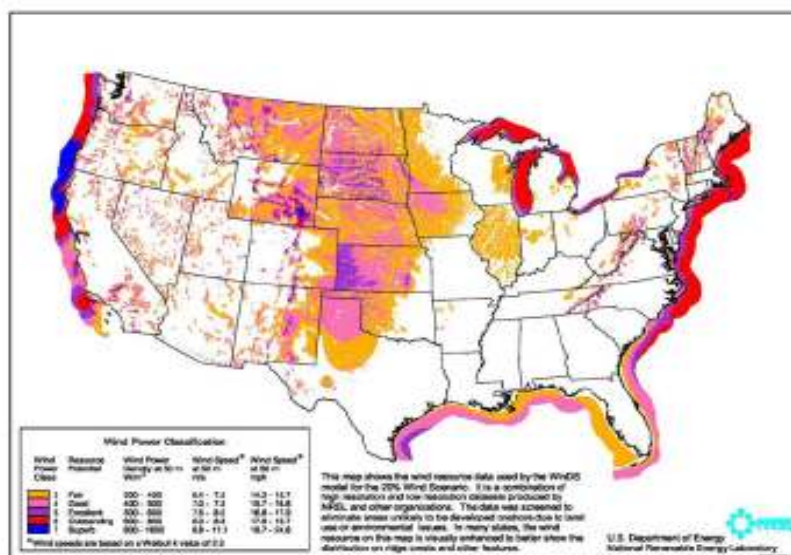


Figure 7: Wind Resource by State

However, Oklahoma is not as far along in wind development as it should be relative to other states. Comparing the installed capacity of wind by state shows that Oklahoma is not one of the most developed (given its resource) as a result of its lacking policy incentives.¹²

¹² Source: 2008 annual wind industry report issued by the American Wind Energy Association (<http://www.awea.org/publications/reports/4Q07.pdf>)

Sub-step 4b: Discuss any similar options that are occurring

Comparing these projects (listed in Figure 5) to Red Hills, they all exhibit differences which drive distinct economic models to Red Hills. The other projects in Oklahoma were built during an earlier time period when market characteristics were very different. Most notably, turbine prices have increased dramatically since 2002:¹⁴

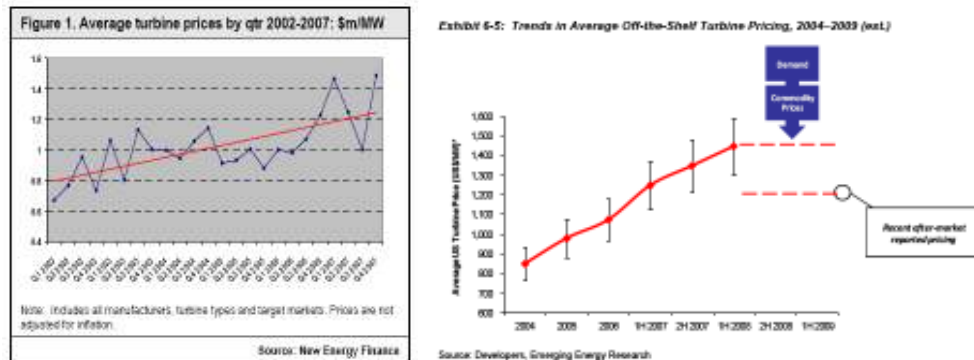


Figure 10: Turbine Price Trends

¹⁴ New Energy Finance and Emerging Energy Research

Two of the projects (Centennial) were contracted under a Build-Operate-Transfer (BOT) agreement instead of a PPA. This allows for a different economic model since the utility buyer can include the wind farm in its rate base and pass on any additional costs to rate payers in order to achieve its required rate of return.

Three of the projects (Oklahoma Wind Centers A & B and Weatherford) were built by FPL which has a different tax and financing position than Acciona. FPL is a large company with significant income, and therefore tax liability, in the US. Since it can use the tax credits from its wind projects to offset its own tax liability, FPL does not need to seek external tax equity financing. Acciona, as well as many other foreign developers active in the U.S. market (e.g. Iberdrola, EDP, eon) does not have enough U.S. income to generate a significant tax liability and therefore must seek external tax equity financing, and factor an additional margin of return into the project for the investor(s).

Other differences in the economics between Red Hills and projects built in Oklahoma prior could include:

- lower balance of plant costs (BOP),
- lower or no required upgrades for interconnection (Red Hills incurred [REDACTED]),
- lower operating costs (e.g. better lease terms),
- lower financing rates, and
- potentially more favorable wind resource.

Some, or all of the factors discussed above, enabled the wind projects built in Oklahoma before Red Hills to sign power purchase agreements at lower prices than that required for Red Hills. Below are the PPA prices for the wind projects built in Oklahoma before Red Hills:¹⁵

- Blue Canyon I sells power with the following price structure:

BLUE CANYON PPA PRICING	
Super Peak (\$/MWh)	\$42.00
Summer Peak (\$/MWh)	\$38.00
Winter Peak (\$/MWh)	\$36.00
Premium (\$/MWh)	\$26.00
Off-peak (\$/MWh)	\$19.50

All prices began escalating by 1% in the fourth year, 2007.

- Oklahoma Wind Energy Center A has an agreement to sell power at peak price of \$23.60/MWh and off-peak price of \$12/MWh. Oklahoma Wind Energy Center B sells its power for \$24.68/MWh.
- Weatherford Wind Energy Center's power is priced at peak \$31.09/MWh and off-peak \$19.28/MWh.
- Blue Canyon II sells under two price structures:

¹⁵ Source: FERC Electric Quarterly Reports, <http://www.ferc.gov/docs-filing/eqr/data/spreadsheet.asp>

BLUE CANYON II PPA PRICING		
	80% of production	20% of production
Super Peak (\$/MWh)	\$48.00	\$38.09
Summer Peak (\$/MWh)	\$41.50	\$32.93
Summer Off-peak (\$/MWh)	\$23.00	\$18.25
Winter Peak (\$/MWh)	\$32.75	\$25.99
Winter Off-peak (\$/MWh)	\$22.00	\$17.46

- Sleeping Bear prices are provided in Table 9 and the analysis shows these prices are not high enough to support Red Hills.
- Both Centennial Wind Energy Projects are Build-Operate-Transfer. Information is not public for the price of acquisition.

If the above prices are run against Red Hills expected production, the average price in each case is equal or lower to that for Sleeping Bear at \$29.59 (analyzed in Section 2.5, Step 2).

Project	Year	Price weighted for Red Hills production (\$/MWh)
Blue Canyon I	2003	\$29.16
Oklahoma Wind Energy Center A	2003	\$17.79
Oklahoma Wind Energy Center B	2003	\$24.68
Weatherford Wind Energy Center	2005	\$25.17
Blue Canyon II	2005	\$23-29

All of the projects were completed at lower PPA prices than what is currently available in the market (after adjusting for inflation). The price increase from 2003 to 2007 is roughly 25% comparing Sleeping Bear's price to the three projects completed in 2003. Over this same time period, turbine prices increased by at least 50%. Since turbine prices are typically contracted for 1-2+ years before a project is built, there is a lag in the impact of increased turbine pricing on projects. Thus, Red Hills felt the impact of increased turbine pricing without a corresponding rise in PPA prices.

Prior to the WFEC RFP mentioned earlier, Red Hills entered three RFPs at the pricing required to reach its project return as well as the return required for investors. The project was rejected from all three. Although prices in the SPP real-time market rose from 2007 to 2009, this increase is not necessarily reflected in the price expectations for the next 20 years under a PPA.

In summary, wind power in Oklahoma shows:

- a continuously low contribution to the overall generation capacity of the state
- a low installed capacity relative to the overall potential for wind
- a slow growth rate for project completion
- intermittent and generally smaller investments

Based on these facts, wind power is not a predominant technology and has not penetrated the market, and therefore is clearly not common practice in Oklahoma. The project adheres to the requirements for common practice as stated in the VCS 2007.

3 Monitoring:

3.1 Title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices:

Title: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

Reference: This is an UNFCCC consolidated baseline methodology ACM0002, version 09, Sectoral scope 01.

The Red Hills Wind Project is a grid-connected wind powered electricity generation source. As such, ACM0002 - Version 09 is the appropriate methodology choice to be applied to this analysis.

3.2 Monitoring, including estimation, modelling, measurement or calculation approaches:

The purpose of monitoring the project’s activities is to provide accurate and timely data gathering in order to ensure the precise quantification of the project baseline and emission reductions.

The primary data gathered will be the net electricity supplied to the Southwestern Power Pool (SPP). The net electricity supplied to the grid will be measured in MWh using a Transda EMS-60 series meter as the primary meter and an ION 8600 series meter as the secondary meter, at the point of interconnection. Data will also be gathered on additional variables as detailed in the tables in section 3.3 below.

To ensure quality and accuracy, data will be collected on a continuous basis and recorded electronically to minimize the chance of error. The project operator will verify the accuracy of project-related data on a monthly basis and will review the data prior to use in emissions reduction calculations.

Emissions reduction calculations will utilize the information that is electronically gathered and stored. The calculations themselves will be consistent with those called for by CDM methodology ACM0002. These calculations are discussed at greater length in section 4 below.

3.3 Data and parameters monitored / Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals:

DATA AND PARAMETERS MONITORED	
Data / Parameter:	EG_y
Data unit:	MWh
Description:	Electricity supplied to the Southwestern Power Pool (SPP)
Source of data to be used:	Joint energy meter reading available at project grid integration point and invoice to Constellation Energy, a contracted third party service provided to which energy measurement and scheduling is outsourced.
Value of data applied for the purpose of calculating expected emission reductions in section 2.5	493,400 MWh
Description of measurement methods and procedures to be applied:	The provisions for metering will be as per the law applicable and implemented in practice to the wind farm in the state of Oklahoma and the provisions of the power purchase agreement (PPA) or merchant agreement. Plant records and maintains the records of all the electricity supplied to the grid, which are monitored continuously at the Systems Operation Center in Chicago, Illinois and reported on a monthly basis. Data is archived electronically. Generation details will be kept two years beyond the crediting period, by Acciona North America and Constellation Energy.
QA/QC procedures to be applied:	This data will be used directly for calculations of emissions reductions. Energy meters are calibrated at regular intervals as per the law applicable and implemented in practice to the wind farm in the state of Oklahoma and/or as per the PPA or merchant agreement signed and the calibration certificates for the same are maintained. The same process will be followed throughout the crediting period.
Any comment:	This data can be cross-verified with the invoices raised by Acciona North America to Constellation Energy and payment received against the invoice. The metering of the supplied power will be executed by using an ION 8600 series meter at the point of interconnection.

Data / Parameter:	TEG_y
Data unit:	MWh
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year <i>y</i> .
Source of data to be used:	The metering of the supplied power will be executed by using a Transda EMS-60 series meter as the primary meter and an ION 8600 series meter as the secondary meter, at the point of interconnection.
Monitoring Frequency:	Hourly measurement and monthly recording
Any comment:	

Data / Parameter:	FC_{i,m,y}
Data unit:	MMBTU
Description:	Amount of fossil fuel type, i, consumed by power plant, m, in year y
Source of data to be used:	U.S. Energy Information Administration electricity production data
Monitoring Frequency:	The ex-ante option has been chosen and therefore, FC _{i,m,y} will be updated <i>once</i> each crediting period.
Any comment:	

Data / Parameter:	EF_{CO₂,i,y}
Data unit:	kgCO ₂ /MMBTU
Description:	CO ₂ emission factor of fossil fuel type, i, in year y
Source of data to be used:	U.S. Energy Information Administration electricity generation emission factors
Monitoring Frequency:	The ex-ante option has been chosen and therefore, EF _{CO₂,i,y} will be updated <i>once</i> each crediting period.
Any comment:	

Data / Parameter:	EG_{m,y}
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant, m, in year y
Source of data to be used:	U.S. Energy Information Administration electricity production data
Monitoring Frequency:	The ex-ante option has been chosen and therefore, EG _{m,y} will be updated <i>once</i> each crediting period.
Any comment:	

Table 11: Data Parameters to Be Monitored

3.4 Description of the monitoring plan

The project operator is responsible for monitoring the electricity generation facility. The monitoring plan will include data monitoring, regular equipment maintenance and calibrations, and data management/archiving. Overall responsibility for the accurate measurement and archival of generation information is managed by the Acciona Energy North America Systems Operation team.

Acciona Energy NA monitors and controls its wind farms and turbines through a SCADA (Supervisory Control and Data Acquisition) system designed by Ingteam and operated by the personnel in the System Operations Center (SOC) in Chicago, Illinois. The SOC operates and monitors all Acciona wind farms in the US and Canada real-time and around the clock. Almost all of the wind farms' indicators and parameters, such as motor temperatures, blade pitch angles, wind speeds, and output voltages are continuously streamed to the SOC. Based on these data SOC operators can control the turbines and

substations remotely by sending appropriate control commands such as Reset, Stop, or Emergency.

The parameters laid out in section 3.3 above will be monitored and the associated data will be aggregated and reported according to the following procedures.

- **Metering Devices:** The project operator will provide metering device information for all test, measurement, and project operating equipment on or before the start of project operations. This information will be updated over the life of the project as devices are replaced. The device record will include a basic specification sheet for each metering device used to measure the wind energy output to the grid.
- **Calibration Log:** The project operator will perform metering device calibrations as required in the Interconnection Agreement. The project operator will provide an annual report detailing the calibration activities associated with the project activity. A copy of each calibration report will be included in the calibration log. The calibration log will also include initial factory calibration records and field test documents showing the calibration upon installation.
- **Extraordinary Events:** The project operator will report any unscheduled maintenance or repair activities that cause system downtime and would therefore prevent the production of emission reductions from the power generation source.
- **Data Management and Archiving:** Generation data will be archived electronically for the duration of the project and kept for two years after the project ceases operations.

Electricity generation will be measured continuously and managed by Acciona data analyst engineers and recorded monthly. This information will also be provided to the Energy Information Agency and will serve as a check on the internally reported generation information.

4 GHG Emission Reductions:

4.1 Explanation of methodological choice:

Title: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

Reference: This is an UNFCCC consolidated baseline methodology ACM0002, version 09, Sectoral scope 01.

The Red Hills Wind Project is a grid-connected wind powered electricity generation source. As such, ACM0002 - Version 09 is the appropriate methodology choice to be applied to this analysis.

4.2 Quantifying GHG emissions and/or removals for the baseline scenario:

GHG emissions have been quantified in accordance with CDM Version 01: “Tool to calculate the emissions factor for an electricity system” which is required by ACM0002 version 09.

This methodological tool determines the CO₂ emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the “operating margin” (OM) and “build margin” (BM) as well as the “combined margin” (CM). The operating margin refers to a cohort of power plants that reflect the existing power plants whose electricity generation would be affected by the proposed VCS project activity. The build margin refers to a cohort of power units that reflect the type of power units whose construction would be affected by the proposed VCS project activity. This tool provides procedures to determine the following parameters:

BASELINE EMISSIONS PARAMETERS		
Parameter	SI Unit	Description
$EF_{grid,CM,y}$	tCO ₂ /MWh	Combined margin CO ₂ emission factor for grid connected power generation in year y
$EF_{grid,BM,y}$	tCO ₂ /MWh	Build margin CO ₂ emission factor for grid connected power generation in year y
$EF_{grid,OM,y}$	tCO ₂ /MWh	Operating margin CO ₂ emission factor for grid connected power generation in year y

Table 12: Baseline Emissions Parameters

In accordance with the aforementioned tool, the following steps have been followed to determine the baseline emissions:

- Step 1: Identify the relevant electric power system
- Step 2: Select and operating margin (OM) method
- Step 3: Calculate the operating margin emissions factor according to the selected method.
- Step 4: Identify the cohort of power units to be included in the build margin (BM).
- Step 5: Calculate the build margin emission factor.
- Step 6: Calculate the combined margin (CM) emissions factor.

Step 1: Identify the relevant electric power system

For the purpose of determining the electricity emission factors, a project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints. Given that the United States has published clear delineations for electricity systems, the SPP has been chosen as the most relevant electricity system for the Red Hills project.

Step 2: Select an operating margin (OM) method:

The calculation of the operating margin emission factor ($EF_{\text{grid,OM,y}}$) is based on one of the following methods:

- (a) Simple OM, or
- (b) Simple adjusted OM, or
- (c) Dispatch data analysis OM, or
- (d) Average OM

Step 3: Calculate the operating margin emission factor according to the selected method

The Simple Operating Margin (OM) method has been chosen as low-cost/must run resources (generation sources such as hydro, geothermal, wind, low-cost biomass, nuclear, and solar as described in the tool) constitute less than 50% of total generation in the SPP.

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant / unit (Option A), or
- Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or

- Based on data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system (Option C)

Option A should be preferred and must be used if fuel consumption data is available for each power plant / unit. In other cases, option B or option C can be used. For the purpose of calculating the simple OM, Option C should only be used if the necessary data for option A and option B is not available and can only be used if only nuclear and renewable power generation are considered as low-cost / must-run power sources and if the quantity of electricity supplied to the grid by these sources is known.

Option A has been applied for the calculation of the simple OM emission factor for the Red Hills Wind Farm. The calculations for this option, have been altered slightly to allow for the use of the most readily available data in the U.S. The original equation and modified equation are outlined below:

Original:

$$EF_{gridOM,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,OMsi}$	=	Simple operating margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$FC_{i,m,y}$	=	Amount of fossil fuel type i consumed by power plant / unit m in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{CO2,i,y}$	=	CO ₂ emission factor of fossil fuel type i in year y (tCO ₂ /GJ)
$EG_{m,y}$	=	Net electricity generated and delivered to the grid by power plant / unit m in year y (MWh)
m	=	All power plants / units serving the grid in year y except low-cost / must-run power plants / units
i	=	All fossil fuel types combusted in power plant / unit m in year y
y	=	Either the three most recent years for which data is available at the time of submission of the VCS Project Description to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

Modified:

$$EF_{gridOM,simple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot EF_{CO2,i,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,OMsi}$	=	Simple operating margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$FC_{i,m,y}$	=	Amount of fossil fuel type i consumed by power plant / unit m in year y (MMBTU)
$EF_{CO2,i,y}$	=	CO ₂ emission factor of fossil fuel type i in year y (kgCO ₂ /MMBTU)
$EG_{m,y}$	=	Net electricity generated and delivered to the grid by power plant / unit m in year y (MWh)
m	=	All power plants / units serving the grid in year y except low-cost / must-run power plants / units
i	=	All fossil fuel types combusted in power plant / unit m in year y
Y	=	Either the three most recent years for which data is available at the time of submission of the VCS Project Description to the DOE for validation (ex ante option) following the guidance on data vintage in step 2

In terms of vintage of data used in the above calculations, project participants can choose between one of the following two options:

Ex ante option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the Project Description, without requirement to monitor and recalculate the emissions factor during the crediting period.

Ex post option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year y is usually only available later than six months after the end of year y , alternatively the emission factor of the previous year ($y-1$) may be used. If the data is usually only available 18 months after the end of the year y , the emission factor of the year proceeding the previous year ($y-2$) may be used. The same vintage (y , $y-1$ or $y-2$) should be used throughout all crediting periods.

For the Operating Margin, the ex ante option has been applied.

Step 4: Identify the cohort of power units to be included in the build margin

The sample group of power units m used to calculate the build margin consists of either:

- (a) The set of five power units that have been built most recently, or
- (b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Project participants should use the set of power units that comprises the larger annual generation.

As a general guidance, a power unit is considered to have been built at the date when it started to supply electricity to the grid.

Capacity additions from retrofits of power plants should not be included in the calculation of the build margin emission factor.

In terms of vintage of data, project participants can choose between one of the following two options:

Option 1: For the first crediting period, calculate the build margin emission factor *ex-ante* based on the most recent information available on units already built for sample group m at the time of VCS Project Description submission for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, *ex-post*, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated *ex-ante*, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

For this analysis, Option 1 (ex-ante), has been applied to calculate the build margin.

Step 5: Calculate the build margin emissions factor

$$EF_{gridBM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	=	CO ₂ emission factor of power unit m in year y (tCO ₂ /MWh)
m	=	Power units included in the build margin
y	=	Most recent historical year for which power generation data is available

Step 6: Calculate the combined margin emissions factor

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{grid,BM,y}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO2 emission factor in year y (tCO ₂ /MWh)
$EF_{grid,OM,y}$	=	Operating margin CO2 emission factor in year y (tCO ₂ /MWh)
w_{OM}	=	Weighting of operating margin emissions factor (%)
w_{BM}	=	Weighting of build margin emissions factor (%)

The following default values should be used for w_{OM} and w_{BM} :

Wind and solar power generation project activities: $w_{OM} = 0.75$ and $w_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods.

Project activity emissions According to the chosen baseline methodology ACM0002, for wind energy based renewable energy project activities, project activity emissions, $PE_y = 0$.

Leakage According to ACM0002, the main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects). Project participants do not need to consider these emission sources as leakage in applying this methodology. In accordance with ACM0002, project activities using ACM0002 shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario. Thus the leakage emissions, $L_y = 0$.

4.3 Quantifying GHG emissions and/or removals for the project:

As described above, approved methodology ACM0002, Version 09, has been implemented for the quantification of GHG emissions for the project activity.

The above calculations, however, have been modified slightly to allow the use of the most readily available data provided by the Energy Information Agency (EIA). Electricity production data and emission factors, measured in kgCO₂/MMBTU, from the EIA have been utilized in the baseline and emission reduction calculations as this is the most authentic and accurate information available in the public domain for U.S. projects. The EIA reports power generation for the various NERC regions as fuel consumed by the respective fuel source, measured in MMBTUs.

The Baseline Emissions (BE_y) were therefore calculated as follows:

[Equation 1]	$BE_y = (EG_y - EG_{baseline}) \cdot EF_{grid,CM,y}$ $= 493,400 MWh / yr \cdot EF_{grid,CM,y}$
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The EF_y is calculated by $EF_{OM,y}$ [Equation 2] and $EF_{BM,y}$ [Equation 3].

The $EF_{OM,y}$ is calculated as follows, using a 3-year average. The specific data and calculations for $EF_{OM,y}$ can be found in Annex A.

[Equation 2]	$EF_{gridOM,simple,y} = \frac{\sum_{i,m} FC_{i,m,y} \cdot EF_{CO2,i,m,y}}{\sum_m EG_{i,m,y}} =$ $= 0.80 \text{ tCO}_2/\text{MWh}$
---------------------	---

The calculation of $EF_{BM,y}$ is as follows. The specific data for $EF_{BM,y}$ can be found in Annex A.

[Equation 3]	$EF_{gridBM,y} = \frac{\sum_m FC_{i,m,y} \cdot EF_{EL,i,m,y}}{\sum_m EG_{i,m,y}}$ $= 0.28 \text{ tCO}_2/\text{MWh}$
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Based on the results derived from Equation 2 and Equation 3, the baseline emission factor EF_y has been calculated using the following formula:

[Equation 4]	$EF_{gridCM,y} = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{gridBM,y}$ $= 0.75 \cdot EF_{OM,y} + 0.25 \cdot EF_{BM,y}$ $= 0.75 \cdot 0.80 + 0.25 \cdot 0.28$ $= 0.67 \text{ tCO}_2 / \text{MWh}$
---------------------	---

EMISSIONS FACTORS	
Parameter	Value (tCO ₂ /MWh)
EF _{OM}	0.80
EF _{BM}	0.28
EF _{CM}	0.67

Table 13: Emissions Factors

4.4 Quantifying GHG emission reductions and removal enhancements for the GHG project:

Emission Reductions for the Red Hills Wind Farm project were calculated as follows:

$ER_y = BE_y - PE_y - L_y$
[Equation 5]
$= 439,400 MWh / yr \times 0.67 \text{ tCO}_2 / MWh$
$= 293,839 \text{ tCO}_2 / yr$
$PE_y = 0 \text{ and } L_y = 0, \text{ therefore } ER_y = BE_y$

Total emission reduction during the 10-year crediting period has been calculated as: **2,938,386 tCO₂**.

EMISSIONS 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)
Year 1 (October 2008 - September 2009)	0	293,839	0	293,839
Year 2 (October 2009 - September 2010)	0	293,839	0	293,839
Year 3 (October 2010 - September 2011)	0	293,839	0	293,839
Year 4 (October 2011 - September 2012)	0	293,839	0	293,839
Year 5 (October 2012 - September 2013)	0	293,839	0	293,839
Year 6 (October 2013 - September 2014)	0	293,839	0	293,839
Year 7 (October 2014 - September 2015)	0	293,839	0	293,839
Year 8 (October 2015 - September 2016)	0	293,839	0	293,839
Year 9 (October 2016 - September 2017)	0	293,839	0	293,839
Year 10 (October 2017 - September 2018)	0	293,839	0	293,839
Total (tCO₂e)	0	2,938,386	0	2,938,386

Table 14: Red Hills Emissions Reductions

5 Environmental Impact:

As described in section 1.7 of this Project Description, the land on which the Red Hills Wind Farm is being constructed is rural agricultural farmland, which is best suited for pasturing livestock and the cultivation of wheat and cotton crops. Local development consists primarily of widely dispersed individual farmsteads. Socioeconomic and environmental activity in the project area will remain unchanged upon completion of the wind farm construction and operation. No dislocation of people or wildlife will occur as a result of the project activity.

There are no federal authorizations or permits required for the project that would entail consultation under Section 7 of the Endangered Species Act, to include the need to obtain project authorization from the U.S. Army Corps of Engineers. There are four federally listed endangered or threatened species that potentially occur in the general vicinity of the Red Hills Wind Project: the interior least tern, whooping crane, piping plover, and the Arkansas River shiner. The project activity has been designed to avoid impacts on the United States waterways.

Acciona Wind Energy USA LLC voluntarily contracted HDR Engineering, Inc. (HDR) and Western Ecosystems Technology Inc. to complete the environmental site assessment (ESA) and Biological Assessment of the property proposed for the Red Hills Wind Project. The environmental assessment was completed by HDR on January 30, 2008 and the biological assessment was completed by Western Ecosystems on March 27, 2008.

Western Ecosystems determined that; “The Red Hills project avoids many of the potential impacts to whooping cranes due to its distal proximity to the main migratory flyway.” Western Ecosystems also determined that other aforementioned endangered species were not threatened by the project activity.

Acciona voluntarily contracted Western Ecosystems to conduct a voluntary bat assessment using acoustic monitoring equipment. Additionally post construction bat mortality monitoring will take place for one year after operation of the facility begins. Any bats that are found during these mortality studies will be offered as a donation to the American Museum of Natural History for their ongoing Genomic Studies.

Further studies such as the wetlands delineation was conducted on November 26 and 27, 2007, by two HDR biologists. The survey was conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987).

Acciona proposes to implement the following design, siting, and conservation measures to ensure to that the ecological environment is not affected by the project activity:

- **Turbine Design:** Acciona will use monopole, tubular designs that eliminate avian perching sites. Guy wires will not be used on turbines. If guy wires are used on the permanent and temporary meteorological towers within the project, appropriate high visibility markings will be used.
- **Collector Line Design:** Acciona will bury the majority (about 88%) of the collector lines for the project. For the overhead collector line

segments and the overhead 138 kV transmission line, Acciona will mark the lines in accordance with methods recommended by the Avian Power Line Committee (APLIC).

- **Transmission Line:** Using guidance from APLIC's Suggested Practices for Avian Protection on Power Lines, approximately 4 miles of on-site overhead 138 kV transmission line will be designed to minimize the potential for bird electrocutions.
- **Lighting:** The Red Hills Wind Project will use the minimum amount of lighting as required by Federal Aviation Administration (FAA). Lighting is anticipated to be pulsating red light on the minimum number of turbines as required by the FAA in order to reduce the disturbances on the local population.
- **Air Impacts:** Wind Power plants do not contribute to atmospheric pollution as no fuel combustion is involved during any stage of the operation. The primary emissions source for the project will be motor vehicle exhaust resulting from construction and maintenance of the project. However, in light of the project activity and the resulting emission reductions, motor vehicle emissions will be a very minor emissions source.
- **Noise Impacts:** Personal protective equipment is provided to workers involved in construction activity to mitigate the effects of noise pollution. Taking into consideration the project life cycle, the magnitude of the impacts during the construction phase are negligible and exists for a temporary period of time until the end of construction phase. Therefore, noise pollution will also be a very minor issue and will not harm the environment.

Acciona recognizes the concerns over the relationship between wind energy development and the ecological environment of the project activity. As such, commitments have been made to evaluate and immediately address issues that impact the project activity area.

6 Stakeholders' comments:

Stakeholders for the Red Hills Wind Farm project include landowners, local residents, local officials, and Acciona staff.

Roger Mills County held public meetings on February 11th and June 16th 2008 to discuss permitting issues for the Red Hills Wind Farm. During these meetings, local constituents were provided the opportunity and platform to discuss their concerns about the project activity.

Each meeting began with a brief progress update for the project activity by the project developer, construction manager, and other project officials. The overall reaction can be summarized as positive. The local residents expressed satisfaction that the project activity has created local employment which is improving the standard of life as well as socio-economic conditions of the surrounding area. Moreover, local landowners have expressed satisfaction that the project activity has led to an increase in land values.

Only one negative issue was raised by one non-participating landowner at the February 11th meeting. This landowner raised concerns that the turbines were too close to the fence surrounding his property, which is not in the project activity area. This concern was investigated by the project developer and it was discovered that the landowner had mistaken a property survey stake that was about 30 feet from his fence for a turbine-staked location. This issue was resolved through further communication with the landowner and was publicly addressed at the June 16th community meeting.

In July 2008, two non-participating landowners from Roger Mills County requested to meet with the project developer to express concerns that the project activity was located too close to their property lines. The landowners expressed that they felt that permitting had occurred without their knowledge and felt that they had been circumvented in the process. Over the course of a two-hour meeting, it was pointed out that Acciona had followed the counties permitting guidance and that there were two public meetings that they did not attend.

These landowners as well as all stakeholders involved in this project activity will be notified of all future public meetings.

7 Schedule:

The Red Hills crediting period will begin on the commercial operation date of October 26, 2008 and will last for 10 years thereafter. The lifespan of the wind farm is expected to be 20 years after the operational date. The project activity will not be terminated for any reason, other than for emergencies, until the end of the operational life. Validation will be complete upon review and approval of this document. Verification will occur depending on the needs of project participants.

8 Ownership:

8.1 Proof of Title:

As per the U.S. Department of Energy Information Agency, ownership of the Red Hills Wind Farm was established with the filing of the EIA form 860. As per the Federal Energy Administration Act of 1974 (Public Law 93-275), this report is mandatory for all grid connected electricity providers. An example of this form is found in Appendix B.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

The Red Hills project does not participate in an emissions trading program.

**ANNEX A
Emissions Calculations**

The data below provides an example of the information used to calculate the baseline emissions factor. The complete analysis can be found in the associated Microsoft Excel Document.

SPP Operating Margin	2005	2006	2007	2005 - 2007 Total
Total Generation (MWh)	229,414,521.91	218,434,622.86	217,938,229.37	665,787,374.14
Total CO2 Emissions (tCO2)	186,239,443.93	173,516,080.43	170,759,718.35	530,515,242.70
CEF(tCO2/MWh)	0.81	0.79	0.78	0.80

SPP Build Margin	
Total Generation (MWh)	36,535,342.84
Total CO2 Emissions (tCO2)	10,391,978.67
BM (tCO2/MWh)	0.28

Factor	Weight	Calculated Value	Unit
Operating Margin Emission Factor	75%	0.80	(tCO2/MWh)
Build Margin Emission Factor	25%	0.28	(tCO2/MWh)
Baseline Emission Factor		0.67	(tCO2/MWh)
Annual Power Generation		439,400	MWh
Total Annual Emission Reduction		293,839	t CO2/yr
Crediting Period		10	years
Total Emission Reduction for 10 years		2,938,386	t CO2

Proprietary and Confidential

**U.S. Department of Energy
The Energy Information Administration
2005 EIA-906/920 Monthly Time Series
Sources: EIA-906/920 and EIA-860**

Total CO2	Total Generation	Emissions Factor
186,239,444	229,414,522	0.812

Facility ID	Facility Name	State	NERC Region	Reported Fuel Type Code	AER Fuel Type Code	ELEC FUEL CONSUMPTION MMBTUS	Emissions Factor (kgCO2/MMBTU)	Conversion to (Mt/MMBTU)	tons CO2	NET GEN (MWh)	EF (tCO2/MWh)
51	Dolet Hills	LA	SPP	LIG	COL	54,329,295	95.47	0.10	5,186,817.83	4,835,630	1.073
51	Dolet Hills	LA	SPP	NG	NG	88,848	53.74	0.05	4,774.67	7,850	0.608
108	Holcomb	KS	SPP	NG	NG	69,289	53.74	0.05	3,723.59	6,967	0.534
108	Holcomb	KS	SPP	SUB	COL	27,788,565	96.12	0.10	2,671,036.89	2,677,939	0.997
165	GRDA	OK	SPP	DFO	DFO	1,415	72.32	0.07	102.35	122	0.839
165	GRDA	OK	SPP	NG	NG	142,583	53.74	0.05	7,662.39	12,264	0.625
165	GRDA	OK	SPP	SUB	COL	72,228,452	96.12	0.10	6,942,598.76	6,720,023	1.033
172	Osceola	AR	SPP	DFO	DFO	4,965	72.32	0.07	359.06	430	0.835
182	Beaver	AR	SPP	WAT	HYC	1,345,205	0.00	0.00	0.00	134,534	0.000
188	Greers Ferry Lake	AR	SPP	WAT	HYC	1,475,432	0.00	0.00	0.00	147,558	0.000

**ANNEX B
Proof of Ownership**

U.S. Department of Energy Energy Information Administration Form EIA-860 (2007)	ANNUAL ELECTRIC GENERATOR REPORT	Form Approved OMB No. 1905-0129 Approval Expires:
NOTICE: This report is mandatory under the Federal Energy Administration Act of 1974 (Public Law 93-275). Failure to comply may result in criminal fines, civil penalties and other sanctions as provided by law. For further information concerning sanctions and data protections see the provision on sanctions and the provision concerning the confidentiality of information in the instructions. Title 18 USC 1001 makes it a criminal offense for any person knowingly and willingly to make to any Agency or Department of the United States any false, fictitious, or fraudulent statements as to any matter within its jurisdiction.		
SCHEDULE 1. IDENTIFICATION		
<u>Survey Contact</u>		
First Name: <u>Phil</u> Last Name: <u>Stiles</u> Title: <u>System Operation Manager</u> Address: <u>Chicago, IL</u> Telephone (include extension): <u>+1 312 673 3027</u> Fax: <u>+1 312 345 0839</u> E-mail: <u>pstiles@acciona-na.com</u>		
<u>Supervisor of Contact Person for Survey</u>		
First Name: <u>Kim</u> Last Name: <u>Smith</u> Title: <u>VP Construction and Services</u> Address: <u>Chicago, IL</u> Telephone (include extension): <u>+1 312 673 3024</u> Fax: <u>+1 312 673 3001</u> E-mail: <u>ksmith@acciona-na.com</u>		
<u>Report For</u>		
Operator Name: <u>Acciona Wind Energy USA LLC f/k/a EHN USA LLC</u> Operator ID: _____ Reporting as of December 31 Year: <u>19 June 2008</u>		
<u>Operator and Preparer Information</u>		
Legal Name of Operator: <u>Acciona Wind Energy USA LLC f/k/a EHN USA LLC</u> Current Address of Principal Business Office of Plant Operator: <u>15th Floor, 333 W Wacker Dr. Chicago, IL 60606</u>		

U.S. Department of Energy Energy Information Administration Form EIA-860 (2007)	ANNUAL ELECTRIC GENERATOR REPORT	Form Approved OMB No. 1905-0129 Approval Expires:		
Preparer's Legal Name (If Different From Operator's Legal Name): _____ Current Address of Preparer's Office (If Different From Current Address of Principal Business Office of Entity): _____ Is the Operator an Electric Utility? ☐ Yes ☒ No				
For questions or additional information about the Form EIA-860, contact the Survey Managers: <table><tr><td>Kenneth McClevey Telephone Number: (202) 586-4258 FAX Number: (202) 287-1960 E-mail: Kenneth.McClevey@eia.doe.gov</td><td>Glenn McGrath Telephone Number: (202) 586-4325 FAX Number: (202) 287-1960 E-mail: Glenn.McGrath@eia.doe.gov</td></tr></table>			Kenneth McClevey Telephone Number: (202) 586-4258 FAX Number: (202) 287-1960 E-mail: Kenneth.McClevey@eia.doe.gov	Glenn McGrath Telephone Number: (202) 586-4325 FAX Number: (202) 287-1960 E-mail: Glenn.McGrath@eia.doe.gov
Kenneth McClevey Telephone Number: (202) 586-4258 FAX Number: (202) 287-1960 E-mail: Kenneth.McClevey@eia.doe.gov	Glenn McGrath Telephone Number: (202) 586-4325 FAX Number: (202) 287-1960 E-mail: Glenn.McGrath@eia.doe.gov			