OKLAHOMA TAX COMMISSION

TAX POLICY DIVISION
DAWN CASH, DIRECTOR

PHONE (405) 521-3133
FACSIMILE (405) 522-0063

June 19, 2009

Re: Our File No. LR-08-181

Dear

I am writing in response to your correspondence wherein you requested a determination of whether certain wind farm components would qualify for the sales tax manufacturing exemption. The facts presented in your correspondence are set forth verbatim[1] along with a response to your request.

FACTS

The wind farm will consist of numerous wind turbines and related equipment located over a several thousand acre site. Company will generally not own land underlying its wind turbines and equipment. Instead, Company anticipates entering into long-term leases with landowners allowing Company to place its wind turbines and equipment on the land. Company's leases typically require Company to remove its wind turbines and equipment after the lease term expires.

The wind turbines will harness kinetic wind energy to generate electrical current. Generated electrical current will be collected from wind turbines and transmitted to a central substation located on the wind farm (the "Collection Substation"). At the Collection Substation, the electrical current will undergo further processing to step up and condition its voltage. The voltage must be stepped up and conditioned to meet specifications of its customers, the , and the owner of transmission facilities ("Transmission Owner"). The wind farm will connect to Transmission Owner's facilities at an "Interconnect Substation." Transmission Owner owns the Interconnect Substation. Company will upgrade (or will pay Transmission Owner to upgrade) the Interconnect Substation with switchgear (including circuit breakers) to protect its wind farm equipment from abnormal grid current. Company

[1] Exhibit references have been omitted from the facts as presented in your request of December 8, 2008.

will also install a high voltage line to connect the Collection Substation to the Interconnect Substation.

Company will sell its electricity output to electricity wholesalers/retailers. It will not sell electricity to end users. Company will transfer title to its electricity and risk of loss at the Interconnect Substation. Company will not perform electricity transmission or distribution services.

B. Explanation of Major Wind Farm Components

I. Wind Turbines

A wind turbine has four main components: (1) a concrete foundation pad, (2) a tower, (3) a rotor (including blades), and (4) a nacelle, which houses the generator and other important equipment. Wind turbines are controlled by sophisticated monitoring and control systems which automatically adjust wind turbine operation and allow operators to make manual adjustments remotely. Unless otherwise indicated, references to wind turbines include all four components.

a. *Concrete Foundation Pad*

Wind turbines are mounted on specially engineered concrete foundations. Pads are engineered to support wind turbines' enormous weight (often 200 - 300 tons, including towers), and to withstand extreme mechanical forces exerted by the wind. Certain electrical grounding components may also be integrated into pads.

b. *Tower*

Towers perform several important, but nonintuitive, electricity generation functions. Due to drag with surface terrain and higher air viscosity, ground level wind velocity is generally slower than at higher elevations. Also, unlike ground level winds, which tend to subside during the night, wind speeds at higher elevations generally remain relatively constant throughout the night. Because wind turbines generate exponentially more electricity from higher wind velocities, towers are designed to raise wind turbines as high as possible within engineering, economic, and environmental constraints. For example, doubling turbine elevation generally increases wind velocities by 10 percent and overall power output by up to 34 percent.

Additionally, higher elevation winds tend to be less turbulent than ground level winds. Wind turbulence causes wind turbines to operate less efficiently and increases component wear. To avoid problems associated with wind turbulence, wind turbines are placed on towers above the most severe turbulence.

Electrical grounding systems are also integrated into towers.

c. *Rotor*

Wind turbines generally have three large fiberglass/epoxy resin or carbon composite blades. Blades attach to a hub which is attached to a drive shaft. Together, the blades, hub, and drive shaft constitute the rotor. Wind causes the blades to spin, which in turn causes the attached hub and drive shaft to rotate. The rotor's sole purpose is to convert kinetic wind energy into rotational mechanical energy for electricity generation.

Rotor rotation speed must be controlled for a variety of reasons, including to keep rotors within centripetal force limits; to keep generators within speed and torque limits, to keep towers within strength limits (blade torque generates stress on towers), and to optimize efficiency in light winds.

Rotor rotation speed can be controlled by adjusting blade pitch *(i.e.,* the angle at which blades face into the wind). Motors or hydraulic systems located in the hub cause blades to pivot on their vertical axis at the hub connection, and thereby control blade pitch. Blade pitch adjustments are generally done automatically through turbine monitoring and control systems, or may be done remotely by operators.

d. *Nacelle*

Most turbine electricity generation equipment is located inside a nacelle (a pod shaped structure) mounted on towers. Rotors connect to the front of nacelles. Inside a nacelle, the rotor drive shaft connects to a transmission which connects to the generator. Yaw motors and gears allow the entire nacelle to rotate atop the tower to face the rotor into the wind.

Rotor drive shafts rotate too slowly to efficiently generate electricity. Therefore, the drive shaft is connected to a transmission which uses a gearbox to significantly increase drive shaft rotational speed. The output shaft from the transmission connects to the generator and spins a rotor inside a stator. Spinning the rotor inside the stator generates electrical current through electromagnetic induction - the same process used in traditional electricity generators.

In addition to the transmission and generator, a nacelle also houses other equipment vital to generating electricity, including monitoring and communication equipment, a generator cooling unit, various electrical componentry, meteorological equipment, and maintenance equipment. Nacelles also protect sensitive equipment from exposure to the elements, including lighting strikes.

2. Collection System

Electrical current generated by wind turbines (at approximately 600 volts) does not meet customer or grid voltage specifications. Without further processing Company could not sell its electricity or place it on the SPP grid - it would be entirely unmarketable. Therefore, Company will erect, or bury, electrical lines to carry electrical current from wind turbines to a central Collection Substation for further processing. Before electricity enters the collection lines, however, its voltage must be stepped up to 34,500 volts. This is done by transformers located in the nacelles, or on pads at the base of each turbine.

Company will use the collection system purely for internal electricity conveyance within the wind farm. The collection system will not be used to transmit electricity owned by others and will not directly connect to the grid.

3. Collection Substation

As indicated above, electrical current generated by wind turbines does not meet customer or SPP grid voltage specifications (even after being stepped up by the nacelle or pad mounted transformers). At the Collection Substation, transformers will step up electricity voltage to customer and SPP grid specifications (138,000 volts). In connection with stepping up electricity

voltage, the Collection Substation will also use electrical equipment, such as circuit breakers and switches (as discussed below) to control the transformers and to protect sensitive electrical equipment. The Collection Substation may also use capacitors and dynamic var devices to regulate and condition electricity to meet grid voltage profile tolerances. Most Collection Substation and Interconnect Substation components will be preinstalled in specially designed housings. After electricity leaves the Collection Substation, it will be in saleable form.

4. Switchgear

Transformers and other sensitive electrical equipment cannot function without appropriate equipment to control them and to protect them from current irregularities, such as short circuits or current overloads. Also, transformers and other electrical equipment cannot be safely maintained unless they are isolated from energized circuits. Accordingly, Company will install "switchgear" to perform these control, protection, and isolation functions. Switchgear includes coordinated devices such as circuit breakers, switches, and related electrical componentry.

Switchgear is generally located on both sides of transformers. For example, Company will utilize switchgear located between the turbines and the Collection Substation transformers to synchronize their operation and to protect transformers from turbine current, and Company will utilize switchgear at the Interconnect Substation (between the Collection Substation transformers and the grid) to synchronize transformer and grid operations and to protect transformers from abnormal grid current. To accomplish this functional integration, Company must carefully select compatible transformers and switchgear. If switchgear were removed from the wind farm circuit, or if switchgear and the transformers were incompatible, the wind farm could not function.

A high voltage line will connect the Collection Substation and the Interconnect Substation. As a practical matter, switchgear performs the same function regardless of whether it is located at the Collection Substation or at the Interconnect Substation. In particular, circuit breakers in the Interconnect Substation will help protect the Collection Substation, the high voltage line, the Interconnect and Collection Substations, the Collection System, and the turbines.

At this point, it is unclear whether Company or Transmission Owner will purchase the switchgear to be installed at the Interconnect Substation. If Transmission Owner purchases the switchgear, Company must reimburse Transmission Owner for the cost of the switchgear. Transmission Owner, however, would retain title to the switchgear.

5. Miscellaneous Equipment and Structures

Company will place monitoring and control equipment on the wind farm site. The equipment will monitor wind characteristics, turbine performance, and interaction with the grid and make appropriate adjustments (either automatically or manually by an operator). Company will also store and use repair parts and tools on the wind farm site.

RESPONSE

The generation of electricity is recognized as manufacturing in Oklahoma. The Oklahoma Sales and Use Tax Codes specifically exempt manufacturers from the payment of sales and use tax on certain purchases. Section 1359 of Title 68 affords a manufacturer a sales tax exemption on its purchases of goods, wares, merchandise, tangible personal property, machinery and equipment

for use in a manufacturing operation. A manufacturing operation, pursuant to 68 O.S. 1352(15), consists of the "designing, manufacturing, compounding, processing, assembling, warehousing, or preparing of articles for sale as tangible personal property" and starts "at the point where the materials enter the manufacturing site and ends at the point where a finished product leaves the manufacturing site." Section 1352(16) of Title 68 defines manufacturing site to mean "a location where a manufacturing operation is conducted, including a location consisting of one or more buildings or structures in an area owned, leased, or controlled by a manufacturer." Subsection (b) of Oklahoma Administrative Code 710:65-13-150.1 sets forth the activities encompassed in a manufacturing operation: product development, production, testing or quality control, production waste disposal, warehousing supplies and equipment, and shipping, and gives examples of the machinery, equipment, tools and supplies utilized in these areas which are eligible for exemption when purchased by a manufacturer. The areas of administration, sales, distribution, transportation, site construction, or site maintenance are not included in a manufacturing operation. 68 O.S. § 1352(15). Site construction is the "construction of buildings and other structures and improvements to real property" and "includes land preparation, new construction, reconstruction, remodeling, renovation, repair, upgrading and making alterations and additions to the real property, whether the work is done by the manufacturer or by other firms." Oklahoma Administrative Code 710:65-13-150.1(a)(9).

Based on the description of the proposed enterprise, Company's manufacturing operation begins at the turbines and ends where the high voltage line connects to the collection substation. Company, as a manufacturer of electricity holding a manufacturer sales tax exemption permit, may purchase the pads, towers, rotors, blades, nacelles and accompanying equipment–brake, low-speed shaft, gear box, generator, controller, anemometer, wind vane, high-speed shaft, yaw drive, and yaw motor, transformers located in the nacelles or on the base of the turbine pads, and collection lines exempt from tax pursuant to Section 1359(1) of Title 68.

Additionally, Company may purchase collection substation components which include step up transformers which increase the voltage of the electricity to 138,000 volts in accordance with customer and grid specifications, circuit breakers and switches utilized to control the transformers and protect electrical equipment along with capacitors and dynamic var devices to regulate and condition the electricity in order to meet grid profile tolerances and the specially designed housing in which these substation components are pre-installed exempt from sales and use tax under the manufacturing exemption. Also, purchases of equipment to monitor wind characteristics and turbine performance and interaction with the SPP grid and other equipment used to automatically or manually adjust the turbines fall within the manufacturing exemption.

The high voltage line is considered part of transportation, a nonexempt area, and consequently cannot be purchased exempt. Further, the switchgear and related equipment located at the transmission owners' interconnect station does not fall within the parameters of a manufacturing operation conducted at a manufacturing site as defined pursuant to Sections 1352(15) and (16) of Title 68.

Purchases of tools or equipment for maintenance of the referenced exempt components used in the manufacturing operation, at the manufacturing site, are exempt from sales and use tax. OAC 710:65-13-150.1(b)(2)(C)(iii).

A contractor may not make purchases of tangible personal property exempt from sales or use tax pursuant to the exemption afforded manufacturers in Section 1359(1) of Title 68. However, an

entity, which in relation to certain agreements may be acting as a contractor engaged in the improvement of real property, may also act as a vendor in respect to other agreements and make purchases for the purpose of being resold to a manufacturer. In order for such purchases to be made exempt from sales tax, the entity must hold an Oklahoma sales tax permit.

This response applies only to the circumstances discussed in your request of December 8, 2008. Pursuant to Oklahoma Administrative Code 710:1-3-73(e), this Letter Ruling may be generally relied upon only by the entity to whom it is issued, assuming that all pertinent facts have been accurately and completely stated, and there has been no change in applicable law.

Sincerely,

OKLAHOMA TAX COMMISSION

Christy J. Caesar

Christy J. Caesar
Tax Policy Analyst