Capricorn Ridge 4 Emission Reduction Monitoring Plan
Execution of Monitoring Plan for Q1-Q2 2010 Verification

This document summarizes the execution of the VCS monitoring plan for the creation of Voluntary Carbon Units (VCUs) from CO_2 emission reductions in the first quarter of 2010 due to the operation of the Capricorn Ridge 4 wind plant. The plant is located ate latitude 31.900878 and longitude -100.817413.

Data and Parameters Monitored

Electricity Supplied to Grid

The electricity supplied to the grid is measured by the MV90 revenue meter located at the Lower Colorado River Authority (LCRA) Divide Substation. The data is sent to ERCOT and to the NextEra Energy Resource facility located in Juno Beach, Florida. The data sent to NextEra is captured and stored in a market data software package called nMarket. The ERCOT market functions in 15 minute intervals so this is the format that the data is stored in nMarket and at ERCOT. ERCOT uses the data sent to them to create Renewable Energy Credits (RECs) for renewable generating plants in its REC tracking system. Each REC is equivalent to one Mega-Watt-hour (MWh) of production from the renewable generating plant. Since Capricorn Ridge 4 is a wind plant, it qualifies as a renewable generator and ERCOT creates RECs for the plant in the ERCOT REC tracking system. The quantity of RECs in the Capricorn Ridge 4 REC tracking account provides an independent third party (ERCOT) verification of the quantity of generation measured by the MV90 meter and captured in nMarket.

Typically there are small differences between the MV90 meter data and what ERCOT posts in the REC tracking system. These discrepancies should be less than the 5.0% materiality threshold. Differences of greater than 5% will trigger the need for further investigation. Since ERCOT is the independent third party verification of the generation quantity, this is the value used for the quantity of electricity supplied to the grid from the project.

As part of the verification process, all of the RECs from the project will be retired in the ERCOT REC tracking system to the satisfaction of a VCS recognized third party verifier. Once the RECs are retired in the tracking system they can never be reactivated, i.e. “unretired”. The RECs will be verified to have been retired before any VCUs are created.

For Q1 2010 the ERCOT REC tracking system shows generation of 80,506 MWh from the Capricorn Ridge 4 project. The total MV90 15 minute interval data from 00:00 01/01/2010 through 00:00 04/01/2010 was 80,153.892 MWh, 0.4374% less than the value in the ERCOT REC tracking system. Since the difference is less than the 5.0% threshold, no further investigation is required. The value in the ERCOT REC tracking system – 80,506 MWh – is the quantity of electricity supplied to the grid in the first quarter of 2010 from the Capricorn Ridge 4 project.

For Q2 2010 the ERCOT REC tracking system shows generation of 95,054 MWh from the Capricorn Ridge 4 project. The total MV90 15 minute interval data from 00:00 04/01/2010

through 00:00 07/01/2010 was 95,054.17 MWh, 0.0002% more than the value in the ERCOT REC tracking system. Since the difference is less than the 5.0% threshold, no further investigation is required. The value in the ERCOT REC tracking system – 95,054 MWh – is the quantity of electricity supplied to the grid in the second quarter of 2010 from the Capricorn Ridge 4 project.

Combined Margin Emission Factor

As discussed in Section 4 – GHG Emission Reductions – of the Project Description document, the combined margin emission reduction factor ($EF_{grid,CM,y}$) was calculated using the latest version of the "Tool to calculate the emissions factor for an electricity system." The Combined Margin is the weighted sum of the Build Margin and the Operating Margin. The Build Margin was calculated using the ex-ante methodology with the most recent EIA generation and emission data for the ERCOT region. The Build Margin ($EF_{grid,BM,y}$) was calculated to be 0.384 tCO_2e / MWh. Since the Build Margin was calculated using the ex-ante methodology it does not have to be updated during the first crediting period.

The Operating Margin ($EF_{grid,OM,y}$) was calculated using the ex-post methodology with the most recent EPA eGRID data. In the Project Description document the Operating Margin was calculated to be 0.695 tCO_2e / MWh. The eGRID2007 data that used was for 2007 (Year 2005). Since the ex-post methodology was used, the Operating Margin will be recalculated whenever the eGRID database is updated. As of this verification the eGRID data has not been updated so the Operating Margin remains 0.695 tCO_2e / MWh.

The "Tool to calculate the emissions factor for an electricity system" methodology defines the weighting factors for wind and solar power generation projects to be 0.25 for the Build Margin (w_{BM}) and 0.75 for the Operating Margin (w_{OM}). The formula for calculating the Combined Margin is given below.

$$EF_{grid,CM,y} = (EF_{grid,BM,y} \times w_{BM}) + (EF_{grid,OM,y} \times w_{OM})$$

For the first and second quarter of 2010 (y = Q1,Q2), the Combined Margin is calculated to be:

$$EF_{grid,CM,y} = (0.383 \times 0.25) + (0.695 \times 0.75) = 0.617\ tCO_2e / MWh$$

Project Emissions

The project uses a small amount of electricity from the grid for offices, an equipment warehouse, an operation and maintenance building and substation back-up power. The project buys the retail electricity from Concho Valley Electric Cooperative. The offices, equipment warehouse and O&M building are shared with 3 other wind projects located near Capricorn Ridge 4. The amount of electricity consumed by the project is calculated using the retail electricity invoices received from Concho Valley Electric Cooperative.

For the common buildings (offices, equipment warehouse and O&M building) the share of electricity consumed by Capricorn Ridge 4 is calculated on a pro rata basis using the nameplate

ratings of the plants. The nameplate rating for Capricorn Ridge 4 is 112.5 MW. The total of the nameplate ratings of the other three wind plants is 550.0 MW. The sum of the Capricorn Ridge 4 nameplate rating and the total nameplate ratings of the other plants is 662.5 MW (112.5 + 550.0). Therefore, Capricorn Ridge 4's share of the shared electricity consumption is 16.98% (112.5 / 662.5) of the shared total. For example, if the sum of the power consumed for the offices, equipment warehouse and O&M building is 100 MWh, Capricorn Ridge 4's share is 33.96 MWh (200 MWh x 16.98%). Power consumed from the grid by the Capricorn Ridge 4 plant and back-up power for the Capricorn Ridge substation are metered separately from the other wind projects and these quantities are added to the calculated shared quantity to get the total project electricity consumed from the grid for the period (y).

For the first quarter of 2010 the project electricity usage was calculated to be 153.568 MWh. For the second quarter of 2010 the project electricity usage was calculated to be 33,675 MWh.

The emissions from the project (PE_y) for the period are calculated using the equation below (y = Q1,Q2 2010).

PE_y = (project electricity usage) x (ERCOT CO_2 output emission rate)

The ERCOT CO_2 output emission rate is taken from the most recent EPA eGRID database - eGRID2007 (Year 2005). The ERCOT CO_2 emission rate in the database is 1,324.35 lb / MWh (0.601 metric tons / MWh). Therefore the emissions from the project for the first quarter of 2010 are calculated to be:

PE_y = (153.568 MWh + 33,675 MWh) x (.601 metric tons / MWh) = 112.53 tCO_2e

Project Emission Reductions

The emissions reduction from the operation of the Capricorn Ridge 4 plant (ER_y) is calculated using the formula below (y = Q1,Q2 2010).

$ER_y = BE_y – PE_y - LE_y$

Where:

BE_y = Baseline Emissions in period y
PE_y = Project Emissions in period y
LE_y = Leakage Emissions in period y

The Baseline Emissions are calculated using the equation below (y = Q1,Q2 2010).

$BE_y = (EG_y – EG_{Baseline}) \times EF_{grid,CM,y}$

Where:

EG_y = Electricity Generated by the project and supplied to the grid
80,506 MWh + 95,054 MWh = 175,560 MWh
(see above - Electricity Supplied to Grid)

$EG_{Baseline}$ = 0 MWh since Capricorn Ridge is a new project
$EF_{grid,CM,y}$ = 0.617 tCO_2e / MWh (see above – Combined Margin Emission Factor)

Therefore:

BE_y = (175,560 MWh – 0 MWh) x (0.617 tCO_2e / MWh) = 108,321 tCO_2e

PE_y = 112.53 tCO_2e (see above – Project Emissions)

LE_y = 0 as described in Section 4.1 of the Project Description document

Therefore, the emissions reduction from the project is calculated as (y = Q1,Q2 2010):

ER_y = 108,321 tCO_2e – 112.53 tCO_2e – 0 tCO_2e = 108,208 tCO_2e

Meter Calibration

The primary (serial # PT-0702A256-01) and secondary (serial # PT-0702A255-01) MV90 revenue meters located at the LCRA substation were inspected and certified on June 4, 2009. The meters were inspected using the ERCOT EPS meter certification procedure. Matthew Kosler from LCRA conducted the certification. The certification document was provided to the third party verifier.