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**Project Summary/Abstract**

Project Title: Innovative Photovoltaic System at the Offices of Morrissey Engineering		
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NEO ADV RENEW. PROJECT SUMMARY/ABSTRACT

Morrissey Engineering is requesting grant funds to defray the cost of installing an innovative electricity-producing solar powered photovoltaic (PV) system on the roof of their corporate headquarters located at 4940 N 118th Street, Omaha Nebraska. Photovoltaic modules that work in conjunction with a high albedo (reflective) white roof to generate power from both direct and reflected sunlight will create a higher concentration of power production than any similarly situated single sided module currently available.

Traditional PV modules that convert sunlight to DC electricity have solid crystalline photovoltaic material on one side of a flat panel. The amount of electricity this module will produce is proportional to the orientation of the module face in relation to direct sunlight exposure. Newer PV technologies place a thin film of amorphous silicon on solid or flexible backing. While this type of PV material does not produce power as efficiently as crystalline silicon under direct sunlight, it does outperform it under ambient light conditions. There are now products commercially available from Sanyo with two electricity producing faces (termed bifacial) that use thin film silicon coated crystalline silicon cells to increase power production efficiency. While one face of the module efficiently uses light directly from the sun for crystalline silicon efficiency, the back face takes advantage of the thin film silicon technology to generate electricity from ambient light reflected off surrounding surfaces. The power from both surfaces combine to create a higher concentration of power production than any similarly situated single sided module currently available. This application will be especially effective at Morrissey Engineering where the high albedo white membrane roof will maximize the amount of indirect light reaching the back surface of the modules.

A PV installation that is rated at approximately 4.8kW under standard test conditions (STC) is planned for this site. Note that this rating does not include the up to 30% additional output that will be produced from the back side of the PV modules. With the 20% output increase Morrissey Engineering expects to achieve at this site included, the industry recognized PVWatts program predicts the system will produce 6319 kWh per year. The EPA's Greenhouse Gas Equivalencies Calculator estimates that replacement of the power that would have been generated from the local electric utility with this renewable power generation will eliminate 5 tons of CO2 emissions annually.

The output of the PV modules will be combined into arrays appropriate for use with a grid-interactive DC to AC voltage inverter. Advanced metering will be included and system output will be logged for production analysis. Wiring for DC voltage will be routed to an interior inverter, and the output of the inverter will be routed to an exterior disconnect switch provided for utility worker safety. The power will then connect into the building electrical distribution where it will feed building load in parallel with utility power. A net metering agreement with OPPD will be sought. Morrissey Engineering intends to commence design and construction of this PV system once grant funds are awarded. With awards announced by February 3rd of 2010, it is expected energy will be generated from this system no later than August 1st of 2010.