Appalachian
STATE UNIVERSITY

Office of Sustainability
Anne Belk Hall
ASU Box 32161
Boone, NC 28608-2161
(828) 262-2664
Fax: (828) 262-2666
sustainability.appstate.edu

March 21, 2013

Ms. Gail L. Mount, Chief Clerk
North Carolina Utilities Commission
4325 Mail Server Center
Raleigh, NC 27699-4325

Re: Docket No. RET-33, Sub 5
Appalachian State University – Application to Register a New Renewable Energy Facility
Solar Thermal Facility at 608 Water Tank Rd., Fleetwood, NC

Dear Ms. Mount,

In response to a request for information in a letter dated June 8, 2012 from The Public Staff, in the person of Jay B. Lucas, to you, Ms. Gail Mount, Chief Clerk North Carolina Utilities Commission; Appalachian State University, would hereby offer the following:

- The specific method of determining the thermal energy produced in BTUs by the Blackburn – Vannoy Farm Residential Solar Thermal system (Docket No. RET-33, Sub 5) in accordance with NCUC Rule R8-67 (g) (4) shall be estimation using the Solar Pathfinder solar assessment software as it is an "industry accepted means that shows what measurable amount of useful thermal energy the system or facility is designed and operated to produce and use". See Exhibit A attached for a complete description of this method.

- The nameplate capacity of this system listed on page 2 of the NCUC application for registration of this renewable energy system is incorrect. Using the SRCC performance rating for this collector, the nameplate capacity in maximum Btu per day is estimated at 6,800 Btu per hour.

Thank you for considering our registration of this system; please let us know if you have any further questions or concerns.

Sincerely,

Jim Dees
Data and Assessment Specialist
Office of Sustainability
Appalachian State University

(22)
(3) DS Electric

Appalachian
STATE UNIVERSITY
Office of Sustainability
Anne Belk Hall
ASU Box 32161
Boone, NC 28608-2161
(828) 262-2664
Fax: (828) 262-2666
sustainability.appstate.edu

REF33 Sub 5

Exhibit A: Process of Determining Solar Thermal Energy Output of the Blackburn Farm Residential Solar Thermal System Using Solar Pathfinder

STEP 1: Using Solar Pathfinder, take photographs of the sun chart at the renewable energy facility's site. If all corners of the facility have equal shading, only one photograph is needed. Take note of the azimuth or horizontal direction in which the facility faces. Also measure the vertical tilt of the solar panels/collectors.

STEP 2: Using Solar Pathfinder Assistant software, input the following:

- latitude and longitude of the site: 36.32^0 N, 81.50^0W
- vertical tilt of the panels/collectors: 30^0 fixed
- chosen weather station: Abingdon-Virginia Highlands AP, VA
- azimuth to which the facility faces: 120^0
- manufacturer and model of the solar facility: Solar Panels Plus, SPP-30A
- number of collectors: 1
- fluid type: 50% glycol
- hot water load (80 gallons per day based on 5 residents)
- tank temperature: 135^0 F
- supply water temperature: 55^0 F
- storage volume: 115 gallons
- energy source being replaced and its efficiency: electricity, 100% efficiency
- cost of energy being replaced: $0.10 per kWh
- load the sun chart photo(s) of from the site
- crop and calibrate the photo for the software to analyze

STEP 3: Use "Tools" "Options" to select the report columns to be displayed and view annual energy output of the system