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NORTH CAROLINA
INTERCONNECTION REQUEST APPLICATION FORM

Utility: _____

Designated Utility Contact: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Telephone Number: _____

Fax: _____

An Interconnection Request Application Form is considered complete when it provides all applicable and correct information required below.

Preamble and Instructions

An Interconnection Customer who requests a North Carolina Utilities Commission jurisdictional interconnection must submit this Interconnection Request Application Form by hand delivery, mail, e-mail, or fax to the Utility.

This Request is for:

Fast Track Process _____ Supplemental Review _____
Section 4 Study Process _____ Standby Generator / Closed Transition _____
Change in Ownership _____

(Refer to Section 3 of the Interconnection Standards for guidance in selection Fast Track Review options. All Generating Facilities larger than 2 MW must use the Section 4 Study Process.)

Processing Fee or Deposit

Fast Track Process – Non-Refundable Processing Fees

- If the Generating Facility is larger than 20 kW but not larger than 100 kW, the fee is $750.
- If the Generating Facility is larger than 100 kW but not larger than 2 MW, the fee is $1,000.

Supplemental Review - Deposit

- If the Generating Facility is larger than 20 kW but not larger than 100 kW, the deposit is $750.
- If the Generating Facility is larger than 100 kW but not larger than 2 MW, the deposit is $1,000.

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Section 4 Study Process – Deposit

If the Interconnection Request is submitted under the Section 4 Study Process, whether a new submission or an Interconnection Request that did not pass the Fast Track Process, the Interconnection Customer shall submit to the Utility an Interconnection Facilities Deposit of (1) $20,000 plus $1.00 per kWAC for all Interconnection Requests less than 20 MW; (2) $35,000 plus one dollar ($1.00) per kWac for all Interconnection Requests between 20 MW and 50 MW; and (3) $50,000 plus one dollar ($1.00) per kWac for all Interconnection Requests greater than 50 MW.

Standby Generator / Closed Transition - Deposit

- If the Facility is less than 1 MW, deposit is $2,500.
- If the Facility is equal to or greater than 1 MW the deposit is $5,000.

Change in Ownership – Non-Refundable Processing Fee

- If the Interconnection Request is submitted solely due to a transfer of ownership or change of control of the Generating Facility, the fee is $500.

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Interconnection Customer Information

Legal Name of the Interconnection Customer (or, if an individual, individual's name)

Legal Entity: _____

Primary Contact Name: _____

Title: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

County: _____

Telephone (Day): _____ (Evening): _____

Fax: _____

Secondary Contact Name: _____

Title: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

County: _____

Telephone (Day): _____ (Evening): _____

Fax: _____

Facility Location (if different from above):

Project Name: _____

Latitude: _____ (decimal format, to at least 4 digits)

Longitude: _____ (decimal format, to at least 4 digits)

Address: _____

City: _____ State: _____ Zip: _____

County: _____

For installations at locations with existing electric service to which the proposed Generating Facility will interconnect, provide the Existing Account Number: _____

_____

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Controlling Entity Information (business in charge of project, if different from the Interconnection Customer):

Controlling Entity: _____

Contact Name: _____

Title: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Telephone (Day) _____ (Evening) _____

Fax: _____

Application is for:

_____ New Generating Facility

_____ Capacity Change to a Proposed or Existing Generating Facility

_____ Change of Ownership of a Proposed or Existing Generating Facility to a new legal entity

_____ Change of Control of a Proposed or Existing Generating Facility of the existing legal entity.

_____ Equipment Substitution

_____ Other

Please provide additional information regarding the proposed change(s): _____

_____

_____

Will the Generating Facility be used for any of the following?

Net Metering? Yes _____ No _____

To Supply Power to the Interconnection Customer? Yes _____ No _____

To Supply Power to the Utility? Yes _____ No _____

To Supply Power to Others? Yes _____ No _____

(If yes, discuss with the Utility whether the interconnection is covered by the NC Interconnection Standard.)

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Is the Generating Facility owned by the Interconnection Customer or Leased from an Electric Generator Lessor in North Carolina?

Owned _____

Leased _____

NCUC Docket No.: _____

Requested Point of Interconnection:_____

Requested In-Service Date: _____

Requested Commercial Operation Date: _____

For installations at locations with existing electric service to which the proposed Generating Facility will interconnect, provide:

Local Electric Service Provider: _____

Existing Account Number: _____

To be provided by the Interconnection Customer if the local electric service provider is different from the Utility:

Contact Name: _____

Title: _____

E-Mail Address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

County: _____

Telephone (Day): _____ (Evening): _____

Fax: _____

Generating Facility Information

Data applies only to the Generating Facility, not the Interconnection Facilities.

Prime Mover Information (Refer to U.S. EIOA Form 860 Instructions, Table 2 Prime Mover Codes and Descriptions at:

https://www.eia.gov/survey/form/eia_860/instructions.pdf)

Prime Mover Code _____

Prime Mover Description : _____

Energy Source Information (Refer to U.S. EIA Form 860 Instructions, Table 28 Energy Source Codes and Heat Content at:
https://www.eia.gov/survey/form/eia_860/instructions.pdf)

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Fuel Type	Energy Source Code	Energy Source Description

Type of Generator: Synchronous ❑ Induction ❑ Inverter ❑

Total Generator/ Storage Nameplate Capacity: _____ kWAC (Typical) _____ kVAR

Storage Nameplate Energy: _____ kWh

Interconnection Customer or Customer-Site Load: _____ kWAC (if none, so state)

Interconnection Customer Generator Auxiliary Load: _____ kWAC

Typical Reactive Load (if known): _____ kVAR

Maximum Generating Capacity Requested: _____ kWAC
(The maximum continuous electrical output of the Generating Facility at any time at a power factor of approximately unity as measured at the Point of Interconnection and the maximum kW delivered to the Utility during any metering period)

Production profile: Provide below the maximum import and export levels (as a percentage of the Maximum Generating Capacity Requested) for each hour of the day, as measured at the Point of Interconnection. Power flow in excess of these levels during the corresponding hour shall be considered an Adverse Operating Effect per section 3.4.4. of the Interconnection Agreement.
Maximum import and export, hour ending:

0100	imp:	exp:	%	0200	imp:	exp:	%	0300	imp:	exp:	%
0400	imp:	exp:	%	0500	imp:	exp:	%	0600	imp:	exp:	%
0700	imp:	exp:	%	0800	imp:	exp:	%	0900	imp:	exp:	%
1000	imp:	exp:	%	1100	imp:	exp:	%	1200	imp:	exp:	%
1300	imp:	exp:	%	1400	imp:	exp:	%	1500	imp:	exp:	%
1600	imp:	exp:	%	1700	imp:	exp:	%	1800	imp:	exp:	%
1900	imp:	exp:	%	2000	imp:	exp:	%	2100	imp:	exp:	%
2200	imp:	exp:	%	2300	imp:	exp:	%	2400	imp:	exp:	%

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Please provide any additional pertinent information regarding the daily operating characteristics of the facility here or attached as noted. Also note information about intended reactive flows:

_____

_____

_____

_____

List components of the Generating Facility equipment package that are currently certified:

Number	Equipment Type	Certifying Entity
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

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Battery Information

Manufacturer, Model & Quantity (for each type):

_____

_____

AC/DC Coupled: ❑ AC ❑ DC

DC-DC Converter Model (if used):

Total Battery Capacity in kWAC: _____

Total Battery Capacity in kWDC: _____

Rated Battery Capacity in MWh: _____

Hours to discharge at Max: _____ Max Ramp Rate MW/s: _____

Rated Discharging Power MW: _____ Rate to Charge: _____

Rate to Discharge: _____

Max Discharging Duration at Rate Power (hrs): _____

Battery Operation

Control Narrative (generally describe the intended operation and output characteristics used for programming the BESS controller – e.g. peak-load serving, flattening solar facility output, etc.): _____

_____

_____

Modes of Operations (check all that apply):

❑ Continuous Charge ❑ Frequency Response ❑ Islanding ❑ Dispatch

Reactive Capability Myar (provide curve if available): _____

Rated Life Span (cycles): _____

Please attach 8760 projections for total facility output with storage.

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Generator (**or solar panel information**)

Inverter Manufacturer, Model & Quantity (for each type):

_____

_____

Other Equipment Manufacturer, Model & Quantity (for each type):

_____

_____

Nameplate Output Power Rating in kWAC: Summer _____ Winter _____

Nameplate Output Power Rating in kVA: Summer _____ Winter _____

Individual Generator Rated Power Factor: _____ Leading _____Lagging

For wind projects provide the following information:

Total Number of Generators in wind farm to be interconnected pursuant to this Interconnection Request: _____

Elevation: _____

For solar projects provide the following information:

Orientation: _____ Degrees (Due South=180°)

❑ Fixed Tilt Array ❑ Single Axis Tracking Array ❑ Double Axis Tracking Array

Fixed Tilt Angle: _____ Degrees

For transmission-connected projects, provide completed PSS/E data sheets for the generic PV library model(s) and user written model.

Impedance Diagram - If interconnecting to the Utility System at a voltage of 44-kV or greater, provide an Impedance Diagram. An Impedance Diagram may be required by the Utility for proposed interconnections at lower interconnection voltages. The Impedance Diagram shall provide, or be accompanied by a list that shall provide, the collector system impedance of the generation plant. The collector system impedance data shall include equivalent impedances for all components, starting with the inverter transformer(s) up to the utility level Generator Step-Up transformer.

Collector System Impedances (For PV Plants)

Collector system voltage = _____ kV

For each line/cable section (different size or length) indicated in the one-line diagram, the following impedance data needs to be provided in an attached Excel spreadsheet.

Length = _____ feet

For Transmission-Connected Projects:

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- R = _____ ohm or _____ pu on 100 MVA and collector kV base (positive sequence)
- X = _____ ohm or _____ pu on 100 MVA and collector kV base (positive sequence)
- C = _____ µF or B = _____ pu on 100 MVA and collector kV base (positive sequence)

Alternatively, check here if Customer wants Duke Energy to use typical values for collector system impedances: ❑

For Distribution-connected projects >=1MW:

- R1 = _____ ohms/mile (Positive Sequence Resistance)
- R0 = _____ ohms/mile (Zero Sequence Resistance)
- X1 = _____ ohms/mile (Positive Sequence Inductive Reactance)
- X0 = _____ ohms/mile (Zero Sequence Inductive Reactance)
- B1 = _____ µS/mile (Positive Sequence Capacitive Susceptance)
- B0 = _____ µS/mile (Zero Sequence Capacitive Susceptance)

Interconnection Transmission Line (For Transmission Projects Only)

(from station transformer to POI)

- Line Voltage = _____kV
- Length = _____ feet
- R = _____ohm or _____ pu on 100 MVA and line kV base (positive sequence)
- X = _____ohm or _____ pu on 100 MVA and line kV base (positive sequence)
- C = _____ µF or B = _____ pu on 100 MVA and line kV base (positive sequence)

Load Flow Data Sheet - If interconnecting to the Utility System at a voltage of 44-kV or greater, provide a completed Power Systems Load Flow data sheet. A Load Flow data sheet may be required by the Utility for proposed interconnections at lower interconnection voltages.

Excitation and Governor System Data for Synchronous Generators - If interconnecting to the Utility System at a voltage of 44-kV or greater, provide appropriate IEEE model block diagram of excitation system, governor system and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be required at lower interconnection voltages. A copy of the manufacturer's block diagram may not be substituted.

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Generating Facility Characteristic Data (for inverter-based machines)
Max design fault contribution current: _____ Instantaneous ❑ RMS❑
Harmonics Characteristics:

Start-up requirements:

Inverter Short-Circuit Model Data
Model and parameter data required for short-circuit analysis is specific to each PV inverter make and model. All data to be provided in per-unit ohms, on the equivalent inverter MVA base.
Inverter Equivalent MVA Base: _____ MVA

Values below are valid for initial 2 to 6 cycles:

Short-Circuit Equivalent Pos. Seq. Resistance (R1): _____p.u.

Short-Circuit Equivalent Pos. Seq. Reactance (XL1): _____p.u.

Short-Circuit Equivalent Neg. Seq. Resistance (R2): _____p.u.

Short-Circuit Equivalent Neg. Seq. Reactance (XL2): _____p.u.

Short-Circuit Equivalent Zero Seq. Resistance (R0): _____p.u.

Short-Circuit Equivalent Zero Seq. Reactance (XL0): _____p.u.

Special notes regarding short-circuit modeling assumptions:

Plant Reactive Power Compensation
Describe which devices (e.g. inverters, capacitors, SVC) will supply reactive power (Mvar) to allow the plant to meet the power factor requirement at the Point of Interconnection (transmission HV bus) when the plant is simultaneously injecting full requested MW. All reactive power compensation devices must be automatically controlled.

In addition to the inverters, if a plant reactive power compensation device is part of the plant design, the following data needs to be provided:

Shunt capacitors: _____(count), _____Mvar each, _____ Mvar total

Shunt reactors: _____(count), _____Mvar each, _____ Mvar total

Dynamic reactive control device type, (SVC, STATCOM): _____

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- Control range _____ Mvar (capacitive), _____ Mvar (inductive)
- Control mode (e.g., voltage, power factor, reactive power): _____
- Regulation set point _____ (kV, power factor, or Mvar)
- Describe the overall reactive power control strategy: _____
- Completed PSS/E data sheets and model for the dynamic reactive control device need to be provided.

Generating Facility Characteristic Data (for rotating machines)

RPM Frequency: _____

(*) Neutral Grounding Resistor (if applicable): _____

Synchronous Generators:

Direct Axis Synchronous Reactance, Xd: _____ P.U.

Direct Axis Transient Reactance, X'd: _____ P.U.

Direct Axis Subtransient Reactance, X"d: _____ P.U.

Negative Sequence Reactance, X2: _____ P.U.

Zero Sequence Reactance, X0: _____ P.U.

KVA Base: _____

Field Volts: _____

Field Amperes: _____

Induction Generators:

Motoring Power (kW): _____

I_2^2t or K (Heating Time Constant): _____

Rotor Resistance, Rr: _____

Stator Resistance, Rs: _____

Stator Reactance, Xs: _____

Rotor Reactance, Xr: _____

Magnetizing Reactance, Xm: _____

Short Circuit Reactance, Xd": _____

Exciting Current: _____

Temperature Rise: _____

Frame Size: _____

Design Letter: _____

Reactive Power Required In Vars (No Load): _____

Reactive Power Required In Vars (Full Load): _____

Total Rotating Inertia, H: _____ Per Unit on kVA Base

Note: Please contact the Utility prior to submitting the Interconnection Request to determine if the specified information above is required.

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Interconnection Facilities Information

Will more than one transformer be used between the generator and the point of common coupling? ❑ Yes ❑ No

(If yes, copy this section and provide the information for each transformer used. This information must match the single-line drawing and transformer specification sheets. For identical transformers, one set of data may be provided.)
Will the transformer be provided by the Interconnection Customer? ❑ Yes ❑ No

Transformer Data (if applicable, for Interconnection Customer-owned transformer):
Is the transformer: Single phase ❑ Three phase ❑ Size: _____ kVA

If Two Winding:

a) Rating (ONAN/ONAF/ONAF): _____/ _____ / _____ MVA
b) Nominal Voltage for each winding (High/Low): _____/ _____ kV
c) Winding Connections (High/Low): [Delta or Wye](grounded) or Wye(ungrounded) / [Delta or Wye](grounded) or Wye(ungrounded)]

   * Transmission: High side should be delta for tap station or wye for switching station with network breakers.

   Distribution: High side should be wye-grounded.

d) Available tap positions: _____ / _____ / _____ / _____ / _____ kV **or** _____ % _____ # of taps.
e) Positive sequence impedance Z_1: _____ %, _____ X/R on self-cooled (ONAN) MVA rating above.
f) Zero sequence impedance Z_0: _____ %, _____ X/R on self-cooled (ONAN) MVA rating above.
g) For pad mounted transformer, construction: 3 / 4 / 5 -legged

For Distribution-connected sites >=1MW for each xfrmr in SLD please include:

a) Eddy Current (No Load) Losses (kW):_____
b) Copper Losses at Full Rated Load (kW):_____
c) Magnetizing (No Load) Current at 100% Voltage (% nominal Current):_____
d) Knee Voltage (% nominal Voltage):_____
e) Air-Core Reactance
   - Ohms:_____

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- per unit:_____(on transformer ONAN MVA base and nominal primary voltage)

f) Manufacturer Estimated Maximum RMS Inrush Current (Primary Side Amps):_____

If Three Winding:

Please attach diagram and mark to reference this form)

	H Winding Data	**X Winding Data**	**Y Winding Data**
Full load ratings (i.e. ONAN/ONAF/ONAF)	_____/_____/_____ MVA	_____/_____/_____ MVA	_____/_____/_____ MVA
Rated voltage base	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected	_____ kV Delta or Wye connected
Tap positions available	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV	_____/ _____/ _____/ _____/ _____ kV
Present Tap Setting (if applicable)	_____ kV	_____ kV	_____ kV
Neutral solidly grounded? (or) Neutral Grounding Resistor (if applicable)	_____ _____ Ohms	_____ _____ Ohms	_____ _____ Ohms
BIL rating	_____ kV	_____ kV	_____ kV

Three Winding Impedance Data:

Please attach diagram and mark to reference this form)

	H-X Winding Data	**H-Y Winding Data**	**X-Y Winding Data**
Transformer base for impedances provided	_____ MVA	_____ MVA	_____ MVA
Positive sequence impedance Z_1	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R
Zero sequence impedance Z_0	_____ % _____ X/R	_____ % _____ X/R	_____ % _____ X/R

Transformer Fuse Data (if applicable, for Interconnection Customer-owned fuse):

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(Attach copy of fuse manufacturer's Minimum Melt and Total Clearing Time-Current Curves)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

Interconnecting Circuit Breaker (if applicable):

Manufacturer: _____ Type: _____

Load Rating (Amps): ____ Interrupting Rating (Amps): _____

Trip Speed (Cycles): _____

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Interconnection Protective Relays (if applicable):

If Microprocessor-Controlled:

List of Functions and Adjustable Setpoints for the protective equipment or software:

	Setpoint Function	Minimum	Maximum
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

If Discrete Components:

(Enclose Copy of any Proposed Time-Overcurrent Coordination Curves)

Manufacturer	Type:	Style/Catalog No.	Proposed Setting
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Current Transformer Data (if applicable):

(Enclose Copy of Manufacturer's Excitation and Ratio Correction Curves)

Manufacturer: _____ Type: _____

Accuracy Class: _____ Proposed Ratio Connection: _____

Manufacturer: _____ Type: _____

Accuracy Class: _____ Proposed Ratio Connection: _____

Potential Transformer Data (if applicable):

Manufacturer: _____ Type: _____

Accuracy Class: _____ Proposed Ratio Connection: _____

Manufacturer: _____ Type: _____

Accuracy Class: _____ Proposed Ratio Connection: _____

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General Information

1. One-line diagram
   Enclose site electrical one-line diagram showing the configuration of all Generating Facility equipment, current and potential circuits, and protection and control schemes.
   - The one-line diagram should include the project owner's name, project name, project address, model numbers and nameplate sizes of equipment, including number and nameplate electrical size information for solar panels, inverters, wind turbines, disconnect switches, latitude and longitude of the project location, and tilt angle and orientation of the photovoltaic array for solar projects.
   - The diagram should also depict the metering arrangement required whether installed on the customer side of an existing meter ("net metering/billing") or directly connected to the grid through a new or separate delivery point requiring a separate meter.
   - List of adjustable set points for the protective equipment or software should be included on the electrical one-line drawing.
   - This one-line diagram must be signed and stamped by a licensed Professional Engineer if the Generating Facility is larger than 50 kW.
   - Is One-Line Diagram Enclosed? Yes ___ No ___
2. Site Plan
   - Enclose copy of any site documentation that indicates the precise physical location of the proposed Generating Facility (Latitude & Longitude Coordinates and USGS topographic map, or other diagram) and the proposed Point of Interconnection.
   - Proposed location of protective interface equipment on property (include address if different from the Interconnection Customer's address)
   - Is Site Plan Enclosed? Yes ___ No ___
3. Is Site Control Verification Form Enclosed? Yes ___ No ___
4. Equipment Specifications
   Include equipment specification information (product literature) for the solar panels and inverter(s) that provides technical information and certification information for the equipment to be installed with the application.
   - Are Equipment Specifications Enclosed? Yes ___ No ___
5. Protection and Control Schemes
   - Enclose copy of any site documentation that describes and details the operation of the protection and control schemes.
   - Is Available Documentation Enclosed? Yes ___ No ___
   - Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).
   - Are Schematic Drawings Enclosed? Yes ___ No ___
6. Register with North Carolina Secretary of State (if not an individual)

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Applicant Signature

I hereby certify that, to the best of my knowledge, all the information provided in this Interconnection Request Application Form is true and correct.

For Interconnection Customer:

Signature _____ Date: _____

(Authorized Agent of the Legal Entity)

Print Full Name _____

Company Name _____

Title With Company _____

E-Mail Address _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

County: _____

Telephone (Day): _____ (Evening): _____

Fax: _____

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In the Matter of the Application of _____for an Interconnection Agreement with Appalachian State University d/b/a New River Light & Power

SITE CONTROL VERIFICATION

I, _____, _____of _____, under penalty of perjury, hereby certify that, _____ or its affiliate has executed a written contract with the landowner(s) noted below, concerning the property described below. I further certify that our written contract with the landowner(s) specifies the agreed rental rate or purchase price for the property, as applicable, and allows _____ or its affiliates to construct and operate a renewable energy power generation facility on the property described below.

This verification is provided to Appalachian State University d/b/a New River Light & Power in support of our application for an Interconnection Agreement.

Landowner Name(s):

_____

Land Owner Contact information (Phone or e-mail):

_____

Parcel or PIN Number: _____

County: _____

Site Address:_____

Number of Acres under Contract (state range, if applicable): _____

Date Contract was executed _____

Term of Contract _____

_____

[Authorized Signatory Name]

_____ being first duly sworn, says that [he/she] has read the foregoing verification, and knows the contents thereof to be true to [his/her] actual knowledge.
Sworn and subscribed to before me this _____ day of _____, 20___.

_____

[Authorized Signatory Name]

Name: _____, Title _____

_____

Notary Public

_____

Name of Notary Public [typewritten or printed]
My Commission expires: _____