

# Albemarle EMC

## Application for Operation of Customer-Owned Generation

**This application should be completed and returned to the Albemarle EMC engineering representative in order to begin processing the request.**

*INFORMATION: This application is used by Albemarle EMC to determine the required equipment configuration for the Customer interface. Every effort should be made to supply as much information as possible.*

### **PART 1 OWNER/APPLICANT INFORMATION**

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

Name: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Facility Location (if different from above): \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

### **PROCESSING FEE OR DEPOSIT**

#### Fast Track Process – Non-Refundable Processing Fees

If the interconnection Request is submitted under the Fast Track Process, the non-refundable processing fee is as follows:

If the Generating Facility is 20 kW or smaller, the fee is \$100.

If the Generating Facility is larger than 20 kW but not larger than 100 kW, the fee is \$750.

#### Supplemental Review – Deposit

If the Generating Facility is larger than 20 kW but not larger than 100 kW, the deposit is \$750.

#### Study Process Deposit

If the Interconnection Request is submitted under the 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 Cooperative an Interconnection Facilities Deposit Charge of \$20,000 plus \$1.00 per kW<sub>AC</sub>.

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.

**PROJECT DESIGN/ENGINEERING (ARCHITECT) (as applicable)**

Company: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Facility Location (if different from above): \_\_\_\_\_  
Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
Email Address: \_\_\_\_\_

**ELECTRICAL CONTRACTOR (as applicable)**

Company: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ County: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Facility Location (if different from above): \_\_\_\_\_  
Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
Email Address: \_\_\_\_\_

**PART 2**

**TYPE OF APPLICATION**

Application is for: \_\_\_\_\_ New Generating Facility  
\_\_\_\_\_ Capacity Addition to Existing Generating Facility  
\_\_\_\_\_ Transfer of Ownership of Existing Generating Facility

If capacity addition to existing Generating Facility, please describe:

\_\_\_\_\_

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 \_\_\_\_\_

Requested Point of Interconnection: \_\_\_\_\_  
Requested In-Service Date: \_\_\_\_\_

**GENERATING FACILITY INFORMATION**

**Energy Source:**

Solar \_\_\_ Wind \_\_\_ Hydro \_\_\_ Hydro Type (e.g. Run-of-River) \_\_\_ Diesel \_\_\_ Natural Gas \_\_\_  
 Fuel Oil \_\_\_ Other (state type) \_\_\_\_\_

**Prime Mover:**

Fuel Cell \_\_\_ Recip Engine \_\_\_ Gas Turbine \_\_\_ Steam Turbine \_\_\_ Microturbine \_\_\_ PV \_\_\_  
 Other \_\_\_\_\_

Type of Generator: Synchronous \_\_\_ Induction \_\_\_ Inverter \_\_\_

Total Generator Nameplate Rating: \_\_\_\_\_ kW<sub>AC</sub> (Typical) \_\_\_\_\_ kVAR

Interconnection Customer or Customer-Site Load: \_\_\_\_\_ kW (if none, so state)

Interconnection Customer Generator Auxiliary Load: \_\_\_\_\_ kW

Typical Reactive Load (if known): \_\_\_\_\_ kVAR

Maximum Generating Capability Requested: \_\_\_\_\_ kW<sub>AC</sub>

(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 Cooperative during any metering period. The maximum kW<sub>AC</sub> shall be the maximum capability of all inverters on site, regardless of any programming limitations that may currently be implemented.)

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:	%

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:

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

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

**Generator (or solar panel information)**

Manufacturer, Model Name, & Number of units: \_\_\_\_\_

Nameplate Output Power Rating in kWAC: \_\_\_\_\_ Summer \_\_\_\_\_ Winter

Nameplate Output Power Rating in kVA: \_\_\_\_\_ Summer \_\_\_\_\_ Winter

Individual Generator Rated Power Factor: Leading \_\_\_\_\_ Lagging \_\_\_\_\_

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

Request (if applicable): \_\_\_\_\_ Elevation: \_\_\_\_\_

Inverter Manufacturer, Model Name, & Number (if used): \_\_\_\_\_

Note: A completed Power Systems Load Flow data sheet must be supplied with the Interconnection Request.

**For solar projects provide the following information:**

Latitude: \_\_\_\_\_ Degrees \_\_\_\_\_ Minutes North

Longitude: \_\_\_\_\_ Degrees \_\_\_\_\_ Minutes West

Orientation: \_\_\_\_\_ Degrees (Due South=180°)

Fixed Tilt Array \_\_\_ Single Axis Tracking Array \_\_\_ Double Axis Tracking Array \_\_\_

Fixed Tilt Angle: \_\_\_\_\_ Degrees

### **GENERATING FACILITY CHARACTERISTICS DATA (for inverter-based machines)**

Max design fault contribution current: \_\_\_\_\_ Instantaneous \_\_\_ or 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

Short-Circuit Equivalent Pos. Seq. Resistance (R1), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Short-Circuit Equivalent Pos. Seq. Reactance (XL1), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Short-Circuit Equivalent Neg. Seq. Resistance (R2), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Short-Circuit Equivalent Neg. Seq. Reactance (XL2), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Short-Circuit Equivalent Zero Seq. Resistance (R0), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Short-Circuit Equivalent Zero Seq. Reactance (XL0), valid for initial 2 to 6 cycles: \_\_\_\_\_ p.u.

Special notes regarding short-circuit modeling assumptions:

\_\_\_\_\_  
\_\_\_\_\_

### **GENERATING FACILITY CHARACTERISTICS 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,  $X_0$ : \_\_\_\_\_ P.U.

KVA Base: \_\_\_\_\_

Field Volts: \_\_\_\_\_

Field Amperes: \_\_\_\_\_

**Induction Generators:**

Motoring Power (kW): \_\_\_\_\_

$I_2^2t$  or K (Heating Time Constant): \_\_\_\_\_

Rotor Resistance,  $R_r$ : \_\_\_\_\_

Stator Resistance,  $R_s$ : \_\_\_\_\_

Stator Reactance,  $X_s$ : \_\_\_\_\_

Rotor Reactance,  $X_r$ : \_\_\_\_\_

Magnetizing Reactance,  $X_m$ : \_\_\_\_\_

Short Circuit Reactance,  $X_d''$ : \_\_\_\_\_

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 Cooperative prior to submitting the Interconnection Request to determine if the specified information above is required.

**EXCITATION AND GOVERNOR SYSTEM DATA FOR SYNCHRONOUS GENERATORS ONLY**

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 determined to be required by applicable studies. A copy of the manufacturer's block diagram may not be substituted.

**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.)

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

Transformer Impedance: \_\_\_\_\_ % on \_\_\_\_\_ kVA Base

If Three Phase:

Transformer Primary \_\_\_\_\_ Volts, Delta \_\_\_ Wye , floating neutral \_\_\_  
Wye Grounded neutral \_\_\_\_\_

Transformer Secondary \_\_\_\_\_ Volts, Delta \_\_\_ Wye , floating neutral \_\_\_  
Wye Grounded neutral \_\_\_\_\_

Transformer Tertiary: \_\_\_\_\_ Volts, Delta \_\_\_ Wye , floating neutral \_\_\_  
Wye Grounded neutral \_\_\_\_\_

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

(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): \_\_\_\_\_

**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: \_\_\_\_\_  
 Manufacturer: \_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
 Manufacturer: \_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
 Manufacturer: \_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting: \_\_\_\_\_  
 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: \_\_\_\_\_

**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 (e.g., USGS topographic map, or other diagram or documentation) 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 \_\_\_

Is Site Control Verification Form Enclosed? Yes \_\_\_ No \_\_\_

### 3. 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 \_\_\_

### 4. 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 \_\_\_

**SIGN OFF AREA**

The customer agrees to provide Albemarle EMC with any additional information required to complete the interconnection. The customer shall operate his equipment within the guidelines set forth by the cooperative.

\_\_\_\_\_  
Applicant

\_\_\_\_\_  
Date

**ELECTRIC COOPERATIVE CONTACT FOR APPLICATION SUBMISSION AND FOR MORE INFORMATION:**

Cooperative: Albemarle EMC  
Title: Manager of Engineering  
Address: Post Office Box 69  
Hertford NC, 27944  
Phone: (252) 426-5735  
Fax: (252) 426-2589  
E-mail: EngineeringManagers@aemc.coop