



Marquette Board of Light and Power  
2200 Wright Street  
Marquette, Michigan 49855  
906-228-0300

## **Electric Interconnection and Net-Metering Policy**

Category 1 Projects  
Aggregate Generator Output  
Of 20 kW and Under

*Effective:* October 1, 2009

# Introduction

This Generator Interconnection Requirements document outlines the process, requirements, and agreements used to install or modify generation Projects with aggregate generation capacity ratings of 20 kW or less, and designed to operate in parallel with the City of Marquette Board of Light and Power (hereinafter referred to as "Board") electrical system.

These requirements are intended to assure adequate protection to the Board equipment, employees, customers and the general public. Technical requirements are defined according to the type of generation, location of the interconnection, and mode of operation (Flow-back of Non Flow-back). The process is intended to provide an expeditious interconnection to the Board's electric system that is both safe and reliable.

This document has been presented to the Marquette Board of Light and Power Directors, and approved on September 29, 2009

The term "Project" will be used throughout the document to refer to electric generating equipment and associated facilities that are not owned by the Board. The term "Project Developer" means a person that owns, operates or proposes to construct, own or operate a Project.

This document does not address other Project concerns such as environmental permitting, local ordinances, or fuel supply. Nor does it address agreements that may be required with the Board and or transmission provider, or state and federal licensing, to market the Project's energy. An interconnection request does not constitute a request for transmission service.

The Board reserves the right to adjust requirements stated herein on a case by case basis. Although the Board is under Local Control and therefore not subject to Michigan Public Service Commission ("MPSC") oversight, it is the intent of the Board to follow MPSC guidelines as they relate to Public Act 295, Section 173, as it relates to Net Metering.

# Interconnection and Parallel Operating Agreement for Category 1 Projects 20 kW or Less

This Interconnection and Parallel Operating Agreement (“Interconnection Agreement”) is entered into on

\_\_\_\_\_, by The City of Marquette Board of Light and Power (Board) and

\_\_\_\_\_, (Utility Customer), and if applicable

\_\_\_\_\_, (Property Owner). The Board and the

Customer are sometimes also referred to as “Parties” or individually as “Party”. Customer shall be the “Project Developer” as used in and for purposes of the applicable Michigan Electric Utility Generator Interconnection Requirements (Interconnection Requirements) as approved by the Michigan Public Service Commission (MPSC).

## I. Recitals

- A. Customer is an electric service customer of the Board in good standing and has submitted a Generator Interconnection Application (Application) to the Board.
- B. Customer desires to interconnect an electric generating facility with maximum aggregate capacity of 20 kilowatts (“kW”) or less (the “Customer Facility” or “Project”) with the Board’s electric distribution system and operate the Project in parallel with the Boards Electric Distribution System, under the Boards Interconnection Requirements for Category 1 (20 kW or less) Projects, as defined in the Electric Interconnection and Net Metering Standards (“Standards”) as approved by the MPSC.
- C. For purposes of this Interconnection Agreement, “interconnect” means establishing a connection between a non-utility generating resource (in this case the Project) and the Boards Electric Distribution System. “Operate in parallel” means generating electricity from a non-utility resource (in this case the Project) that is connected to the Boards system. In all cases, terms shall have the meaning as defined in the Standards.
- D. Interconnection of the Customer Facility or Project, with the Board’s Electric Distribution System is subject to this Agreement, the Application, the Interconnection Requirements, the Standards and applicable utility fees.
- E. This Agreement does not address any purchase or sale of electricity between the Board and the Customer, nor does create any agency, partnership, joint venture or other business arrangement between or among the Board, Customer and/or Property Owner.

## II. Agreement

NOW THEREFORE, in consideration of the above recitals, the mutual covenants contained herein and for good and valuable consideration, the Parties agree as follows:

### 1. Description of Customer Facility

The Customer Facility must be built with the following ratings, which shall not be changed without 30 days advanced written notice to the Board according to the notice requirements herein:

- 1.1 Photovoltaic /Solar ("PV") Array Rating: \_\_\_\_\_ kW  
Certified test Record number (UL1741 Scope 1.1A): \_\_\_\_\_ kW  
Wind Turbine ("WT") Rating: \_\_\_\_\_ kW  
Hydroelectric Turbine ("HT") Rating: \_\_\_\_\_ kW  
Fuel Cell ("FC") Rating: \_\_\_\_\_ kW  
Other (specify type and rating): \_\_\_\_\_ kW  
Service Type (*circle one*):    Single Phase    Three Phase  
Voltage Level: \_\_\_\_\_  
Equipment Specifications: Make: \_\_\_\_\_  
Model: \_\_\_\_\_ Serial No.: \_\_\_\_\_

### 1.2 Customer Facility Location

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If the Customer is not the owner of the property identified above, the Property Owner must sign this Agreement for the purposes indicated in paragraph 5.

- 1.3 Customers Account Number: \_\_\_\_\_  
Property Owner's Account Number (if applicable): \_\_\_\_\_

- 1.4 The Customer Facility is planned to be ready for parallel operation on or about: \_\_\_\_\_.

### 2. Interconnection Facilities

If it is necessary for the Board to install certain interconnection facilities ("Interconnection Facilities") and make certain modifications in order to establish an interconnection between the Customer Facility and the Board's Electric Distribution System, the interconnection facilities and modifications shall be describe to the Customer/Project Developer.

### 3. Design Requirements, Maintenance and testing of Customer Facilities and Projects

- 3.1 Customer shall be responsible for the design and installation of the Project and obtaining and maintaining any required governmental authorizations and/or permits which may include, but shall not be limited to permits, zoning, easements to clear rights-of-way for the installation and maintenance of the Project. Project Developer shall reimburse the Board for its costs and expenses to acquire any easements and or permits necessary to extend the Boards facilities to the point of interconnection.
- 3.2 Customer shall, at its own expense install and properly maintain protective relaying equipment and devices to protect its equipment and service, and the equipment and service of the Board and its customers, from damage, injury and interruptions, and will assume any loss, liability or damage to the Project caused by lack of or failure of such protection. Protective relaying equipment and devises must meet standards as outlined in IEEE 1547 "Standard for Distributed Resources Interconnected with Electric Power Systems", and tested and certified by Underwriters Laboratories according to testing standard UL 1741. Results of such testing shall be provided to the Board. Prior to the Project operating in parallel with the Board's electric system, Project Developer shall provide satisfactory evidence to the Board that it has met Interconnection Requirements, including but not limited to the receipt of approval from local governmental agencies/bodies and local building /electrical code inspections and subsequent approvals.
- 3.3 At its own expense, the Customer shall perform operational testing at least five (5) days prior to the installation of any Interconnection Facilities by the Board. The Customer shall contact the Board and arrange for a mutually agreeable time for performing these tests. Board may send qualified personnel to the Project to inspect the facility and observe the testing and operation of the Project. Customer shall provide the Board with a written report explaining all test results, including a copy of the generator commissioning test report and UL certificate of compliance.

Protective relaying equipment shall be tested annually to insure proper operation according to IEEE 1547 and UL 1741. Test may be conducted or witnessed by the Board at the customer's sole expense. The results of such testing shall be provided to the Board in writing for review and approval. The Board may, at any time and at its sole expense, inspect and test the Project to verify the protective equipment is in service, properly maintained and calibrated to provide the intended protection. This inspection may also include a review by the Board of the Project Developers pertinent records. Inspection, testing and/or approval by the Board, or the omission of any inspection testing and/or approval by the Board pursuant to this Agreement shall not relieve the Customer of any obligations or responsibility under the terms of this agreement.

- 3.4 Customer shall operate and maintain the Project in a safe and prudent manner and in conformance with the applicable laws and regulations. Project Developer shall obtain and maintain and governmental authorizations and permits required for the construction and operation of the Project.

### 4. Disconnection

The Board shall be entitled to disconnect the Project from the Board's Electric System, or otherwise refuse to connect the Project if; (a) Customer has not complied with any one of the technical requirements contained in the applicable Interconnection Requirements, (b) the electrical characteristics of the Project

are not compatible with the characteristics of the Board's Electric System, (c) an emergency condition exists on the Board's Electrical System, (d) Project's protective relaying equipment fails, (e) the Board determines that the Project is disrupting service to any of the Board's customer(s), (f) disconnection is required to allow for construction, installation, maintenance, repair, replacement, removal, investigation, inspection or testing of any part of the Board's Electric System facilities, (g) if a required installation (e.g., telephone/communication line) fails or becomes inoperable and is not repaired in a timely manner. As determined by the Board, or (h) Customer commits a material breach of this Agreement.

## 5. Access to Property

- 5.1 At its own expense Customer shall make the Project Facility site available to the Board 24 hours per day, 365 days per year. The site shall be free from hazards and shall be adequate for the operation and construction of the Interconnection Facilities. The Board, its agents and employees, shall have full right and authority of ingress and egress at all reasonable times across the property at which the Project is located, for the purpose of installing, operating, maintaining, inspecting, replacing, repairing and removing of Interconnection Facilities. The right of Ingress and egress shall not unreasonably interfere with the Project Developers or (if different) Property Owner's use of property.
- 5.2 The Board may enter the property on which the Project is located to inspect, at reasonable hours, Customer's protective devices and read or test meters. The Board will make reasonable efforts to provide Customer or Property Owner, if applicable, at least 24 hours notice prior to entering said property, in order to afford Customer or Property Owner the Opportunity to remove any locks (if key not provided to the Board), or encumbrances to entry; *provided however*, that the Board may enter the property without notice (removing, at Customer's expense, any lock or other encumbrance to entry) and disconnect the Interconnection Facilities if the Board believes that disconnection is necessary to address a hazardous condition, and/or to protect persons, Board Facilities, or the property of others from damage or interference caused by the Project.
- 5.3 By executing the Interconnection Agreement, Customer and/or Property Owner, if applicable, consents and agrees to provide access to its property on which the Project Facility is located to the Board as described in this section, but does not assume or guarantee other performance obligations of the Project Developer and/or Property Owner, in applicable, under this Interconnection Agreement

## 6. Indemnity and Liability

- 6.1 Unless caused by the sole negligence or intentional wrongdoing of the other party, each Party to the Interconnection Agreement shall at all times assume all liability for, and shall defend, hold harmless, and indemnify the other Party and its directors, officers, employees and agents from, any and all, damages, losses, claims, demands, suits, recoveries, costs, legal fees, and expenses, (a) for injury or death of any person or persons whomsoever occurring on its own system, or (b) for any loss, destruction of, or damage to any property of third persons, firms, corporations or other entities occurring on its own system, including environmental harm or damage, or (c) arising out of, or resulting from, either directly or indirectly, its own Interconnection Facilities, or (d) arising out of, or resulting from, either directly or indirectly, any electric energy furnished to it hereunder after such energy has been delivered to it by such other Party. The provisions of this section shall survive termination or expiration of the interconnection agreement.

6.2 The Provision of Section 4 shall not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provision of any valid insurance policy.

6.3 Notwithstanding anything in this Section, or any other provision of this Interconnection Agreement to the contrary, any liability of a Party to the other Party shall be limited to direct actual damages, and all other damages at law or in equity are hereby waived. Under no circumstances shall a Party be liable to the other Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary, or consequential damages, including lost profits. The indemnification obligations and limits on liability in this Section shall continue in full force and effect notwithstanding the termination or expiration of this Interconnection Agreement, with respect to any event or condition giving rise to an indemnification obligation that occurred prior to such termination or expiration.

## 7. Breach and Default

A breach of this Interconnection Agreement ("Breach") shall occur upon the failure of a Party to perform or observe any material term or condition of the Interconnection Agreement, the Standards, or the Interconnection Requirements. Upon a Breach by one Party, the non-breaching Party shall give written notice of such Breach to the breaching Party. The Party in Breach shall have 30 days from the date of the written notice to cure such Breach. If the Breach is not cured within the 30 day period provided for herein, the Party in Breach shall be deemed to be in default ("Default"). The non-defaulting party shall have the right to terminate the Interconnection Agreement by written notice, shall be relieved of any further obligation hereunder, and may pursue any and all remedies available to it by law or in equity.

## 8. Governing Law

This Interconnection Agreement Shall be interpreted, governed and construed under the laws of the State of Michigan.

## 9. Amendment, Modification, or Waiver

Any amendments or modifications to this Interconnection Agreement, shall be in writing and agreed to by both Parties. The failure of any Party, at any time to require performance of any provision hereof shall be in no manner affect its right at a later time to enforce the same. No waiver by any Party of the Breach of any term or covenant contained in this Interconnection Agreement, whether by conduct or otherwise, shall be deemed to be construed as a further or continuing waiver of any such Breach or a waiver of the Breach of any other term or covenant unless such waiver is in writing.

## 10. Notices

Any notice required under the Interconnection Agreement shall be in writing and mailed or personally delivered to the Party at the address below. Written notice is effective within three days of depositing the notice in the United States mail, first class postage prepaid. Personal notice is effective upon delivery. Written notice of any address changes shall be provided. All written notices shall refer to the Project Developers Board (electric utility) account number, as provided in section 1 of this Agreement. All written notices shall be directed as follows:

Notice to Board:

Marquette Board of Light and Power  
Attention Superintendent of Distribution  
2200 Wright Street  
Marquette, MI 49855

Notice to Customer:

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Notice to Property Owner (if other than customer):

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11. Term of Agreement and Termination

This Agreement shall become effective upon execution by all parties and, if applicable, the Property Owner, and it shall continue in full force and effect until terminated upon 30 days written notice by either Party, upon Default of either Party as set forth in Section 7, upon mutual agreement of both parties, or upon a change in ownership of either the Customer Facility or the property at which the Customer Facility is located absent a valid assignment under Section 14.

12. Entire Agreement

This Agreement supersedes all prior discussions and agreements between the Parties with respect to the subject matter hereof and constitutes the entire agreement between the Parties hereto.

13. No Third Party Beneficiary

The terms and provisions of this agreement are intended solely for the benefit of each Party, and it is not the intention of the Parties to confer third-party beneficiary right upon any other person or entity.

14. Assignment and Binding Effect

This Agreement shall not be assigned by a Party without the prior written consent of the other Party. Any attempt to do so will be void. Subject to the preceding this Agreement is binding upon, inures to the benefit of, and is enforceable by the Parties and their respective successors and assigns. Customer agrees to notify the Board in writing upon the sale or transfer of the Customer Facility. This Agreement shall terminate upon such notice unless the Board consents to an assignment.

15. Severability

If any provision of the Agreement is determined to be partially or wholly invalid, illegal, or unenforceable, then such provision shall be deemed to be modified or restricted to the extent necessary to make such provision valid, binding and enforceable; or, if such provision cannot be modified or restricted in a manner so as to make such provision valid, binding or enforceable, then such provision shall be deemed to be

excised from this Agreement and the validity, binding effect, and enforceability of the remaining provisions of this Agreement shall not be affected or impaired in any manner.

16. Signatures

The Parties to this Agreement hereby agree to have two originals of this Agreement executed by their duly authorized representatives, This Agreement is effective as of the later or latest of the dates set forth below.

*Marquette Board of Light and Power*

Signature: \_\_\_\_\_

Date \_\_\_\_\_

Name (printed): \_\_\_\_\_

Title \_\_\_\_\_

*Customer*

Signature: \_\_\_\_\_

Date \_\_\_\_\_

Name (printed): \_\_\_\_\_

Title \_\_\_\_\_

*Property Owner (if applicable)*

Signature: \_\_\_\_\_

Date \_\_\_\_\_

Name (printed): \_\_\_\_\_

Title \_\_\_\_\_

# Technical Requirements for Cogeneration

The following discussion details the technical requirements for interconnection of Projects 20kW or less. For Projects within this capacity rating range, the Marquette Board of Light and Power (Board) has made a significant effort to simplify the technical requirements. This effort has resulted in adoption of IEEE Std. 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems, being incorporated herein by reference.

Certain requirements, as specified by this document, must be met to provide compatibility between the Project and the Board's electric system, and to assure that the safety and reliability of the electric system is not degraded by the interconnection.

## Major Component Design Requirements

The data requested in Appendix B, for all major equipment and relaying proposed by the Project Developer must be submitted as part of the initial application for review and approval by the Board. The Board may request additional data be submitted as necessary during the study phase to clarify the operation of the Project.

Once installed, the interconnection equipment must be reviewed and approved by the Board prior to being connected to the Board's electric system and before parallel operation is allowed.

### Data

The data that the Board requires to evaluate the proposed interconnection is documented on a "fill in the blank" checklist by generator type in Appendix B.

A site plan, one-line diagrams, and interconnection protection system details of the Project are required as part of the application data. The generator manufacturer supplied data package should also be supplied.

### Isolating Transformers(s)

If a Project Developer installs an isolating transformer, the transformer must comply with the current ANSI Standard C57.12.

The type of generation and electrical location of the interconnection will determine the isolating transformer connections. Allowable connections are detailed in the "Specific Requirements by Generator Type" section later in this document. Note: some utilities do not allow an isolation transformer to be connected to a grounded utility system with an ungrounded secondary (Utility side) winding configuration, regardless of the Project type. Therefore, the Project Developer is encouraged to consult with the Board prior to submitting an application.

### Isolation Device

After review, this device may not be required by the Board. If required and/or installed, this device would be placed at the Point of Common Coupling (PCC). It can be a circuit breaker, circuit switcher, pole top switch, load-break disconnect, etc., depending on the electrical system configuration. The following are required of the isolation device:

- Must be approved for use on the Board system
- Must comply with current relevant ANSI and/or IEEE Standards
- Must have load break capability, unless used in series with a three-phase interrupting device
- Must be rated for the application
- If used as part of a protective relaying scheme, it must have adequate interrupting capability. The Board will provide maximum short circuit and X/R ratios available at the PCC upon request.

- Must be operable and accessible by the Board at all times (24 hours a day, 7 days a week)
- The Board will determine if the isolation device will be used as a protective tagging point. If the determination is so made, the device must have a visible open break, provisions for padlocking in the open position, and it must be gang operated. If the device has automatic operation, the controls must be located remote from the device.

### **Interconnection Lines**

Any new line construction to connect the Project to the Board's electric system will be undertaken by the Board at the Project Developer's expense.

## **Relaying Design Requirements**

Regardless of the technology if the interconnection, for simplicity for all Projects in this capacity rating range, the interconnection relaying system must be certified by a nationally recognized testing laboratory to meet IEEE Std. 1547. The data submitted for review must include information from the manufacturer indicating such certification, and the manufacturer must placard the equipment such that a field inspection can verify the certification.

A copy of this standard may be obtained (for a fee) from the Institute of Electrical and Electronics Engineers ([www.ieee.org](http://www.ieee.org)).

### **Momentary Paralleling**

For situations where the Project will only be operated in parallel with the Board's electric system for a short duration (100 milliseconds or less), as in a make-before-break automatic transfer scheme, no additional relaying is required. Such momentary paralleling requires a modern integrated Automatic Transfer Switch (ATS) system which is incapable of paralleling the Project with the Board's electric system. The ATS must be tested, verified, and documented by the Project Developer for proper operation at least every two years. The BOARD may be present during this testing.

### **Automatic Reclosing**

The Board employs automatic multiple-shot reclosing on most of their circuit breakers and circuit reclosers to increase the reliability of service to its customers. Automatic single-phase overhead reclosers are regularly installed on distribution circuits to isolate faulted segments of these circuits.

The Project Developer is advised to consider the effects of Automatic reclosing (both single phase and three-phase) to assure that the Project's internal equipment will not be damaged. In addition to the risk of damage to the Project, an out-of-phase reclosing operation may also present a hazard to Board equipment since this equipment may not be rated or built to withstand this type of reclosing. The Board will determine relaying and control equipment that needs to be installed to protect its own equipment from out-of-phase reclosing. Installation of this protection will be undertaken by the Board at the Project Developer's expense.

### **Single-Phase Sectionalizing**

The Board also installs single-phase fuses and/or reclosers on its distribution circuits to increase the reliability of service to its customers. Three-phase generator installations may require replacement of fuses and/or single-phase reclosers with three-phase circuit breakers or circuit reclosers at the Project Developer's expense.

## **Specific Requirements by Generator Type**

### **Synchronous Projects**

An isolation transformer may be required for three-phase Synchronous Generator Facilities. Except as noted below, the isolation transformer must be incapable of producing ground fault current to the Board system; any connection except delta primary (Project side), grounded-wye secondary (Board side) is acceptable. A grounded-wye – grounded-wye transformer connection is acceptable on if the Project's single line-to-ground fault current contribution is less than the Project's three-phase fault current contribution at the PCC. Protection must be provided for internal faults in the isolating transformer; fuses are acceptable.

### **Induction Projects**

No isolation transformer is required between the generator and the secondary distribution connection. If an isolation transformer is used for three-phase installations, any isolation transformer connection is acceptable except grounded-wye (Board side), delta (Project side). Protection must be provided for internal faults in the isolating transformer; fuses are acceptable. The Board does not require the Project Developer to provide any protection for Board system ground faults.

### **Relay Setting Criteria**

The relay settings for Projects less than 30 kW must conform to the values specified in IEEE Std. 1547.

### **Maintenance and Testing**

The Board reserves the right to test the relaying and control equipment that involves protection of the Board electric system whenever the Board determines a reasonable need for such testing exists.

The Project Developer is solely responsible for conducting and documenting proper periodic maintenance on the generating equipment and its associated control, protective equipment, interrupting devices, and main Isolation Device, per manufacturer recommendations.

Routine and maintenance checks of the relaying and control equipment must be conducted in accordance with provided written test procedures which are required by IEEE Std. 1547, and test reports of such testing shall be maintained by the Project Developer and made available for Board inspection upon request. [NOTE: IEEE 1547 requires that testing be conducted in accordance with written test procedures, and the nationally recognized testing laboratory providing certification will require that such test procedures be available before certification of the equipment.]

### **Installation Approval**

The Project Developer must provide the Board with five business days advance written notice of when the Project will be ready for inspection, testing, and approval.

Prior to final approval for Parallel Operation, the Board reserves the right to inspect the Project and require action to assure conformance to the requirements stated herein.

## **Miscellaneous Operational Requirements**

Miscellaneous requirements include synchronizing equipment for Parallel Operation, reactive requirements, and system stability limitations.

### **Operating in Parallel**

The Project Developer will be solely responsible for the required synchronizing equipment and for properly synchronizing the Project with the Board electric system.

Voltage fluctuation at the PCC during synchronization is limited by IEEE Std. 1547.

These requirements are directly concerned with the actual operation of the Project with the Board:

- The Project may not commence parallel operation until approval has been given by the Board. The completed installation is subject to inspection by the Board prior to approval. Preceding this inspection, all contractual agreements must be executed by the Project Developer.
- The Project must be designed to prevent the Project from energizing into a de-energized Board line. The Project's circuit breaker or contactor must be blocked from closing in on a de-energized circuit.
- The Project shall discontinue parallel operation with a particular service and perform necessary switching when requested by the Board for any of the following reasons:
  1. When public safety is being jeopardized
  2. During voltage or loading problems, system emergencies, or when abnormal sectionalizing or circuit configuration occurs on the Board system
  3. During scheduled shutdowns of Board equipment that are necessary to facilitate maintenance or repairs. Such scheduled shutdowns shall be coordinated with the Project.
  4. In the event there is demonstrated electrical interference (i.e., voltage flicker, harmonic distortion, etc.) to the Board's customers, suspected to be caused by the Project, and such interference exceeds the current system standards, the Board reserves the right, at the Board initial expense, to install special test equipment as may be required to perform a disturbance analysis and monitor the operation and control of the Project to evaluate the quality of power produced by the Project. If the Project is proven to be the source of the interference, and that interference exceeds the Board's standards or generally accepted industry standards, then it shall be the responsibility of the Project Developer to eliminate the interference problem and to reimburse the Board for the costs of the disturbance monitoring installation, removal, and analysis, excluding the cost of the meters or other special test equipment.
  5. When either the Project or its associated synchronizing and protective equipment is demonstrated by the Board to be improperly maintained, so as to present a hazard to the Board system or its customers.
  6. Whenever the Project is operating isolated with other Board customers, for whatever reason
  7. Whenever the Board notifies the Project Developer in writing of a claimed non-safety related violating of the Interconnection Agreement, and the Project Developer fails to remedy the claimed violation within ten working days of notification, unless within that time either the Project Developer files a complaint with the MPSC seeking resolution of the dispute or the Project Developer and Board agree in writing to a different procedure.

If the Project has shown an unsatisfactory response to requests to separate the generation from the Board system, the Board reserves the right to disconnect the Project from parallel operation with the Board electric system until all operational issues are satisfactorily resolved.

### **Reactive Power Control**

Synchronous generators that will operate in the Flow-back Mode must be dynamically capable of providing 0.90 power factor lagging (delivering reactive power to the Board) an 0.95 power factor leading (absorbing reactive power from the Board) at the Point of Receipt. The Point of Receipt is the location where the Board accepts delivery of the output of the Project. The Point of receipt can be the physical location of the billing meters or a location where the billing meters are not located, but adjusted for line and transformation losses.

Induction and Inverter-Type Projects that will operating in the Flow-back Mode must provide for their own reactive needs (steady state unity power factor at the Point of Receipt). To obtain unity power factor, the Induction or Inverter-Type Project can:

1. Install a switchable Volt-Ampere reactive (VAR) supply source to maintain unity power factor at the Point of Receipt; or
2. Provide the Board with funds to install a VAR supply source equivalent to that required for the Project to attain unity power factor at the Point of Receipt at full output.

There are no interconnection reactive power capability requirements for Synchronous, Induction, and Inverter-Type Projects that will operate in the Non-Flow-back Mode. The Board's existing rate schedules, incorporated herein by reference, contain power factor adjustments based on the power factor of the metered load at these facilities.

### **Site Limitations**

The Project Developer is responsible for evaluating the consequences of unstable generator operation or voltage transients on the Project equipment and determining, designing, and applying any relaying which may be necessary to protect that equipment. This type of protection is typically applied on individual generators to protect the generator facilities.

The Board will determine if operation of the Project will create objectionable voltage flicker and/or disturbances to other Board customers and develop any required mitigation measures at the Project Developer's expense.

### **Revenue Metering Requirements**

The Board will own, operate, and maintain all required billing metering equipment at the Project Developer's expense.

#### **Non-Flow-back Projects**

A Board meter will be installed which only records energy deliveries to the Project.

#### **Flow-back Projects**

Special billing metering will be required. The Project Developer may be required to provide, at no cost to the Board, a dedicated dial-up voice-grade circuit (POTS line) to allow remote access to the billing meter by the Board. This circuit shall be terminated within 10 feet of the meter involved.

The Project Developer shall provide the Board access to the premises at all times to install, turn on, disconnect, inspect, test, read, repair, or remove the metering equipment. The Project Developer may, at its option, have representative witness this work.

The metering installations shall be constructed in accordance with the practices, which normally apply to the construction of metering installations for residential, commercial, or industrial customers. For Projects with multiple generators, metering of each generator may be required. When practical, multiple generators may be metered at a common point provided the metered quantity represents only the gross generator output.

The Board shall supply the Project Developer all required metering equipment and the standard detailed specifications and requirements relating to the location, construction, and access of the metering installation and will provide consultation pertaining to the meter installation as required. The Board will endeavor to coordinate the delivery of these materials with the Project Developer's installation schedule during normal scheduled business hours.

### **Communication Circuits**

The Project Developer is responsible for ordering and acquiring the telephone circuits required for the Project interconnection. The Project Developer will assume all installation, operating, and maintenance costs associated with the telephone circuits, including the monthly charges for the telephone lines and any rental equipment required by the local telephone provider. However, at the Board's discretion, the Board may select an alternative communication method, such as wireless communications. Regardless of the method, the Project Developer will be responsible for all costs associated with the material and installation, whereas the Board will be responsible to define the specific communication requirements.

The Board will cooperate and provide utility information necessary for proper installation of the telephone circuits upon written request.

All telephone circuits (both voice and data) must be analog circuits.

APPENDIX A to Electric Interconnection and Net-Metering Policy

## Customer Checklist for Utility Interconnection

- Submit an application with payment of applicable processing fee(s) to the Marquette Board of Light and Power.
  - ✓ Interconnection inverter must be UL1741 Listed or IEEE1547 compliant.
  - ✓ Electrical single-line diagram, site-specific plan view, and catalog cuts must be included with application.
  - ✓ A lockable disconnect for the Marquette Board of Light and Power's use must be provided.
- Send application to:  
ATTN: Distribution Superintendent  
Marquette Board of Light and Power  
2200 Wright Street  
Marquette, MI 49855
- Receive contingent interconnection approval from the Marquette Board of Light and Power.
- Parties execute Net Metering/Interconnection Agreement.
- Get electrical/building permit from County of Marquette Code Enforcement. Follow the National Electrical Code (NEC) as required.
- Obtain city/township zoning approvals.
- Complete the generating facility installation.
- The Marquette Board of Light and Power enables/installs bi-directional meter(s).
- Get inspections from County of Marquette.
- Submit *Certificate of Completion* to the Marquette Board of Light and Power.
- Start generating energy.

Questions? Contact the Marquette Board of Light and Power's Superintendent of Distribution, David Lynch, at 906-228-0325.

APPENDIX B to Electric Interconnection and Net-Metering Policy

## Application for Interconnecting a Generating Facility

This application is considered complete when it provides all applicable and correct information required below. Additional information to evaluate the application may be required.

Processing Fee

A non-refundable processing fee of \$75 (20 kW or less) or \$100 (21 kW up to 150 kW) must accompany this application.



### Interconnection Customer

Name \_\_\_\_\_

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

Address \_\_\_\_\_

City, State ZIP \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

Fax \_\_\_\_\_ Email Address \_\_\_\_\_



### Contact (if different than Interconnection Customer)

Name \_\_\_\_\_

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

Address \_\_\_\_\_

City, State ZIP \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

Fax \_\_\_\_\_ Email Address \_\_\_\_\_



### Generating Facility Information

Location \_\_\_\_\_ Utility Account # \_\_\_\_\_

Inverter Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Nameplate Rating \_\_\_\_\_ kW \_\_\_\_\_ kVA \_\_\_\_\_ Volts

Single Phase \_\_\_\_\_ or Three Phase \_\_\_\_\_

**Attach an Electric Single-Line Diagram, facility plan view, and equipment catalog information to assist the Marquette Board of Light and Power in its review.**

Energy Source: \_\_\_\_\_solar \_\_\_\_\_wind \_\_\_\_\_hydro \_\_\_\_\_other (describe):

Is the equipment UL1741 Listed? \_\_\_\_\_Yes \_\_\_\_\_No

Does equipment comply with IEEE Standard 1547? \_\_\_\_\_Yes \_\_\_\_\_No

**Attach manufacturer's cut-sheet showing Listing/Standard compliance.**

Estimated Installation Date \_\_\_\_\_ Estimated In-Service Date: \_\_\_\_\_

**Interconnect Customer Signature**

I hereby certify that, to the best of my knowledge, the information provided in this application is true. I agree to abide by the Marquette Board of Light and Power's *Rules for Cogeneration and Small Power Production*, and return the Certificate of Completion when the generating facility has been installed.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

---

***BOARD Use Only***

**Contingent Approval to Interconnect the Generating Facility**

Interconnection of the Generating Facility is approved contingent upon the terms and conditions included within the *Rules for Cogeneration and Small Power Production*, and return the Certificate of Completion.

\_\_\_\_\_  
Utility Representative

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

Utility waives inspection/witness test? Yes \_\_\_\_\_ No \_\_\_\_\_

APPENDIX C to Electric Interconnection and Net-Metering Policy

## Application for Net Metering

This application is considered complete when it provides all applicable and correct information required below. Additional information to evaluate the application may be required.

Processing Fee: A non-refundable processing fee of \$25 (20 kW to 150 kW) must accompany this application.

---

**Interconnection Customer**

Name \_\_\_\_\_

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

Address \_\_\_\_\_

City, State ZIP \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

Fax \_\_\_\_\_ Email Address \_\_\_\_\_

Are you interested in selling Renewable Energy Credits (REC's)? Yes \_\_\_\_\_ No \_\_\_\_\_

---

**Generation System Site Information**

Interconnection Application Number, if known \_\_\_\_\_

Physical Site Service Address \_\_\_\_\_  
(if not billing address) \_\_\_\_\_

Annual Site Requirements Without Generation in Kilowatt Hours \_\_\_\_\_

Peak Annual Site Demand in Kilowatts (only for customers billed on demand rates) \_\_\_\_\_

---

**Generation System Information**

System Type (solar, wind, biomass, fuel cell, geothermal, etc.) \_\_\_\_\_

Generator Nameplate Rating \_\_\_\_\_

Expected Annual Output in Kilowatt Hours \_\_\_\_\_

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**Net Metering Customer Signature**

I hereby certify that, to the best of my knowledge, the information provided in this application is true. I have attached the \$25 Net Metering Application Fee.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date



APPENDIX D to Electric Interconnection and Net-Metering Policy

## Generating Facility Certificate of Completion

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### Interconnection Customer

Name \_\_\_\_\_

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

Address \_\_\_\_\_

City, State ZIP \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

Fax \_\_\_\_\_ Email Address \_\_\_\_\_

Location (if different) \_\_\_\_\_ Utility Account # \_\_\_\_\_

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### Electrician

Name \_\_\_\_\_

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

Address \_\_\_\_\_

City, State ZIP \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

Fax \_\_\_\_\_ Email Address \_\_\_\_\_

OK License # \_\_\_\_\_ Date of Utility Contingent Approval for Interconnection \_\_\_\_\_

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**Inspection** (Completed by local electrical wiring inspector, or attach a signed electrical inspection.)

The Generating Facility has been installed and inspected in compliance with the local building/electrical cost of Marquette County, State of Michigan.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Inspector's Name (please print)

\_\_\_\_\_  
Date