



**GUIDANCE ON THE CONNECTION OF PRIVATE
GENERATORS INCLUDING COMBINED HEAT AND
POWER UNITS AND RENEWABLE ENERGY
GENERATORS TO THE GUERNSEY ELECTRICITY
DISTRIBUTION NETWORK**

1.0 INTRODUCTION

This document is intended to provide guidance to designers and installers wishing to connect private generating plant to the Guernsey Electricity network. The document is structured to provide a commercial section, a technical section, a legal section and appendices containing an application form, a list of references to other relevant technical information and a tariff sheet.

If, after studying this guidance document, a decision is made to proceed with a private generation project then the designer/installer is advised to submit the application form (enclosed as Appendix 1) to Guernsey Electricity as soon as possible. In the event that a network reinforcement project is required to allow connection of a private generator then the lead time can be up to 3 years to allow for any necessary road works. Every effort will, of course, be made to fit in with designer's timescales.

Where private generating plant forms part of a development, designers should complete a standard Guernsey Electricity Additional Load Form as well as the Generating Plant Parallel Operation Application.

2.0 COMMERCIAL CONSIDERATIONS

In assessing the financial viability of any proposed private generation scheme designers will need to take account of the following:

- 1) The tariff that Guernsey Electricity will apply for electricity consumed from the grid.
- 2) The buy-back rate that Guernsey Electricity will pay for electricity delivered into the grid for resale by Guernsey Electricity.
- 3) The existence of standby situations.
- 4) The possibility of, and arrangements for, electricity transfer across the grid.

2.1 TARIFFS FOR ELECTRICITY CONSUMED FROM THE GRID

Where Guernsey Electricity is required to supply electricity to “top-up” a private generator the tariff to be used will be one of the standard range of tariffs described on the tariff leaflet Appendix 3. For installations where the expected maximum import power is greater than **50kW** it is most likely that the Standard Maximum Demand tariff or Industrial Economy tariff would be used, depending on the time of day energy usage profile. For installations where the expected maximum import power is less than 50kW either the standard tariff or Super Economy 12 tariff will be most likely.

Guernsey Electricity will confirm the tariff to be applied to any installation after receipt of the completed application forms.

Designers should take particular note that a power factor charge is already part of the Industrial Economy Tariff and Standard Maximum Demand Tariffs

2.2 THE “BUY-BACK” RATE

Provided that the Guernsey Electricity system is capable of accepting energy from a private generator and other technical requirements are met (refer to Section 3) then Guernsey Electricity will purchase electricity from a private generator. The rate to be paid will be closely related to Guernsey Electricity's marginal cost of production and will vary monthly with Guernsey Electricity's own costs. The rate shown in the latest tariff applying to Guernsey Electricity's customers will give a good guide to the price designers may expect. For up to date information designers are advised to contact the Energy Sales Engineer.

2.3 STANDBY SITUATIONS

Guernsey Electricity recognises two distinct situations when a private generator is connected in parallel with the Guernsey Electricity network:

- 1) Where shut down of the generator will result in all or a major part of the generator's load being transferred to the Guernsey Electricity system. (Standby service).
- 2) Where shut down of the generator will result in loss of supply to the private operator. (No Standby).

2.3.1 STANDBY SERVICE

In this case, where Guernsey Electricity can be seen to be required to provide a standby service then a monthly charge is made for this based on the agreed installed power output of the private generator. This will not apply in cases where the installed capacity is less than 3kW. However, installations larger than this, in particular renewable projects will be individually judged on their merits.

The latest Guernsey Electricity tariff gives the charge rate ruling at the date of the tariff. Designers are advised to contact the Energy Sales Engineer for the latest information.

Where a scheme is designed so that only a proportion of the load will be transferred to Guernsey Electricity on generator shut down, this should be stated on the application form. The effectiveness of such a scheme will need to be verified during generator commissioning tests.

2.3.2 NO STANDBY SERVICE

In this case no standby charge will be applicable.

2.4 ELECTRICITY TRANSFER ACROSS GUERNSEY ELECTRICITY DISTRIBUTION NETWORK

Where a private generator wishes to use the Guernsey Electricity network to transport electricity from one point to another within the island of Guernsey, Guernsey Electricity will negotiate an individual arrangement to suit the particular application.

In every case a use of system charge will be payable calculated on the amount of energy transferred in any accounting period. In some circumstances a charge may also be calculated on the maximum power the network is required to carry. The private generator will also be required to pay any costs for the additional metering and any system reinforcement that may be required.

The negotiated rate for energy transfer within the island of Guernsey will vary widely according to the distance and voltage levels that the transport covers. Designers contemplating the use of this facility are advised to contact the Engineering Services Manager as soon as possible to discuss proposed schemes and ascertain the use of system charges that would apply.

3.0 TECHNICAL CONSIDERATIONS

3.1 INTRODUCTION

The connection of any private generator, however driven, to Guernsey Electricity's distribution network requires careful technical design to ensure

that operation and security of the network is not prejudiced, causing annoyance to other customers and danger to network operating staff. The issue is of particular importance when the connection of synchronous generators and any generator with a rated power in excess of 15kW is being considered.

The distribution system in Guernsey operates in a similar manner to that of the UK, since connection was made to mainland France in 2001 rendering UK guidelines and technical specifications entirely relevant. A list of appropriate specifications appears in Appendix 2.

3.2 SPECIFIC PROTECTION AND INSTALLATION REQUIREMENTS

Designers should note that the Institution of Electrical Engineers Wiring Regulations 17th Edition (BS7671: 2008) have the force of law in Guernsey. Private generator installations, in common with all other installations, should be designed and installed in full compliance with this document and will not be connected to the system unless Guernsey Electricity have inspected the installation and are satisfied that this requirement has been met.

Engineering Recommendation G59/1 sets out the specific electrical protection requirements for generators operating in parallel with public electricity supplies. Unless subject to a specific written exemption all private generators connected to the Guernsey Electricity system will require a G59/1 protection package. The correct operation of this package must be tested and demonstrated to Guernsey Electricity's satisfaction before the private generator is connected to the system. Designers and installers should note that it is their responsibility to arrange these tests and provide all necessary test equipment. Once connected to the system this protection package must be retested not less than once every six years. Guernsey Electricity reserve the right to inspect test records and to disconnect any generator from the system if tests and test results are

found to be inadequate. All costs met by Guernsey Electricity in providing services to allow the connection of private generators to the distribution system will be chargeable to the customer to whose electricity service the private generator is connected.

For guidance on any other technical issues designers should refer to the relevant documents as listed in Appendix 2. Should any new guidance document be issued by the relevant UK or European authorities Guernsey Electricity reserve the right to require operators of private generators to meet the requirements of such document. In the unlikely event of this occurring, operators will be given reasonable time of at least 12 calendar months to comply.

4.0 LEGAL CONTEXT

The generation and distribution of electricity in the island of Guernsey is governed by the Electricity Law (Guernsey) 2001 as amended. The law provides for the licencing and connection of private generators on conditions set out by Guernsey Electricity and approved by the Office of Utility Regulation. Provided that a private generator has met the requirements of this guidance document in all respects no further conditions will be attached to a connection licence.

Appendix 1 - Application Form.

Appendix 2 - List of technical reference documents - see attached.

Appendix 3 - Tariff leaflet.

Application for Parallel Operation of Private Generation with Guernsey Electricity Distribution Network

I/We hereby apply for permission to operate a private electricity generating unit in parallel with the Guernsey Electricity electrical distribution system.

1.0 Owners/Company Details

Name:

Address:
.....
.....

Telephone Number:

Address of installation (if different from above):
.....
.....

Meter Number of service connection

2.0 Generating Plant Details

Type of Generator (Synchronous, Asynchronous, Inverter, Renewable)
.....
.....

Manufacturer

Rated: Voltage
Frequency
Capacity (kVA)
Current
Power Factor

3.0 Prime Mover Details

Type of Prime Mover
Fuel or Renewable Energy

4.0 Method of synchronisation between the Private Generator's system and the Guernsey Electricity distribution system:

.....
.....
.....

5.0 Who is responsible for plant maintenance and failure records:

.....
.....
.....

6.0 Technical Considerations

The generator package shall comply with Electricity Association Engineering Recommendation G.59/1 (section 6 refers). The following minimum protection arrangements shall be incorporated to enable safe parallel operation with the Guernsey Electricity power system.

Protection	Phases	Trip Setting	Tripping time
Under Voltage	All	-10% (Ph-N)	0.5s
Over Voltage	All	+ 10% (Ph-N)	0.5s
Under Frequency	One	-6%	0.5s
Over Frequency	One	+1%	0.5s

Suitable overcurrent protection to suit installation.

The electrical installation will need to comply with the 16th edition of the IEE Wiring Regulations. On completion and inspection testing of the installation, the above protection requirements will need to be witnessed by a Guernsey Electricity representative during commissioning tests. It is the installer's responsibility to arrange these tests and to provide any necessary test equipment.

With this application please include a detailed electrical schematic diagram(s) of the proposed installation including proposed Neutral/Earth bonding arrangements.

7.0 Mode of Operation

Is it intended that power will be exported to the G.E. system? YES / NO

If YES, please state the following:

Likely peak power
Minimum power
Estimated total annual energy export

Where energy is exported metering costs will be chargeable to the electricity service account holder.

Signed for date / /....

APPENDIX 2

- British Standard BS7671: 2008 - *"Requirements for Electrical Installations"*
(IEE Wiring Regulations - 17th Edition)
- Engineering Recommendation G59/1 - *"Recommendations for the Connection of
Generating Plant to the Regional
Electricity Companies' Distribution
Systems"*,
- Engineering Recommendation G19/1 - *"Model Guidelines for Operations or Work
on the Premises of Consumers Receiving
H.V. Supply"*.
- EA Recommendations: G.5/3 : 1976 - *"Limits for Harmonics in the United
Kingdom Electricity Supply System"*.
- P.28 : 1989 - *"Planning Limits for Voltage Fluctuations
caused by Industrial, Commercial and
Domestic Equipment in the United
Kingdom"*.
- P.29 : 1990 - *"Planning Limits for Voltage Unbalance in
the United Kingdom"*.

APPENDIX 3

See separate tariff sheet on the public information area of the website for latest tariff information.