# NET BILLING, ELECTRIC POWER WHEELING AND AUXILIARY CONNECTIONS GRID-INTERCONNECTION PROGRAMME

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## MINISTRY OF SCIENCE, ENERGY & TECHNOLOGY

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## 1 Acknowledgements

The Ministry of Science, Energy and Technology (MSET) wishes to acknowledge the support and participation of all key stakeholders who contributed directly and indirectly to the development of the Net Billing, Electric Power Wheeling and Auxiliary Connections Grid-Interconnection Programme. Special thanks to representatives from OUR, JPS and the USAID who provided invaluable information through technical reviews and discussions.

Additionally, we appreciate the support of the BSJ, GER, JSEA and the hundreds of self-generators who participated in the Net Billing Pilot Programme, which has provided invaluable knowledge and experience for the development of this document.

## 2 List of Acronyms

| | |
|---|---|
| BSJ | Bureau of Standards Jamaica |
| GEI | Government Electrical Inspectorate |
| GER | Government Electrical Regulator |
| GOJ | Government of Jamaica |
| GPE | Generation Procurement Entity |
| JPS | Jamaica Public Service Company Limited |
| JSEA | Jamaica Solar Energy Association |
| kW | Kilo Watt |
| LEI | Licensed Electrical Inspector |
| MSET | Ministry of Science, Energy and Technology |
| MSTEM | Ministry of Science, Technology, Energy and Mining |
| MW | Mega Watt |
| NEP | National Energy Policy |
| NREL | National Renewable Energy Laboratory |
| OUR | Office of Utilities Regulation |
| RE | Renewable Energy |
| SG | Self-Generator |
| SOC | Standard Offer Contract |
| USAID | United States Agency for International Development |

## 3 Background

In 2009, the National Energy Policy 2009-2030 established the policy framework for the transformation of Jamaica's energy sector from too much dependence on petroleum, high energy intensity and high retail prices. It provides opportunities for fuel diversification, development and deployment of renewable energy sources (RE), responsible use of energy and a consultative approach to modernize the energy infrastructure. Within such context, a 20 percent target for renewable energy in the national energy supply mix was established as it was felt that additional studies would be necessary to refine or improve the level of renewable energy contribution. In 2012, the target was further refined by the Ministry of Science, Technology, Energy and Mining (MSTEM) and a target of 30 percent renewables was established for electricity production. In order to achieve this target, the Government of Jamaica launched several initiatives aimed at accelerating renewable and clean energy developments with a focus on wide scale participation of the electricity sector stakeholders.

Among the initiatives was the Net Billing Programme by which customers of the Jamaica Public Service Company (JPS), the electricity grid operator; could generate their own electricity from renewable sources and sell the excess to the JPS at a tariff equivalent to the (monthly) short term avoided cost of fuel. This initiative was launched in May, 2012 by the Office of Utilities Regulation (OUR) as a 2-year pilot programme with an objective to increase the contribution of renewables to the electricity grid by 12.8 MW, representing 2 percent of the 640.0MW electricity system peak demand.

Plagued with a number of start-up challenges, the pilot programme did not achieve its additional generation capacity objective but invaluable experience and knowledge was gained. It however was extended until May 2015 when the JPS decided to discontinue the programme until the promised programme review and assessment was concluded.

In January 2015 the OUR engaged the United States Agency for International Development (USAID), supported by the National Renewable Energy Laboratory (NREL) to conduct a study of the Net Billing Pilot Programme. The study which was published in June 2015 benefitted from consultations with a wide cross-section of stakeholders including the JPS, Government Electrical Inspectorate (GEI), Bureau of Standards Jamaica (BSJ) and the Jamaica Solar Energy Association (JSEA).

The study found that the pilot programme achieved 1.4MW, representing approximately 0.2% of the electricity system peak demand. There were 336 applications, 298 Licences issued and only 120 systems were connected to the utility grid. The study also highlighted several challenges that resulted in the low uptake. Some of these challenges were the:

- Complexity, length of time to interconnect and opaque nature of the interconnection process
- Lack of clear interconnection, equipment, inspection and installer standards and codes
- Insufficient GEI staff to handle the volume of system inspections
- Lack of clarity about what happens at the end of the 5-year net billing period
- Concerns about the RE system size caps of 10kW residential and 100kW commercial

- Cost and benefit disproportionalities between stakeholder groups
- Equity concerns related to the net billing rate

In addition, the study recommended several measures that will assist in reducing and or eliminating the challenges identified by the various stakeholders. Some of the recommendations were:

- Separating interconnection and net billing, realigning various agency roles and responsibilities, shortening the timeline for interconnection and permitting and adopting an expanded approved inverters list
- Changing the RE size cap for individual systems
- Changing the deposit and fee structure for the net billing programme
- Studying and determining programmatic next steps in advance of when the 2% (12 MW) net billing programme cap is reached such that there is no unexpected gap in programming to support Jamaican policy goals. These actions could include:
    - the establishment of clear goals for both net billing and distributed generation in the context of the country's larger renewable energy goals.
    - Creating, through amnesty or registration, a full understanding of the current distributed generation on the electric grid, for the purpose of longer term planning

The report also describes recommendations for a policy and programme environment to support safe, reliable and cost effective distributed generation in Jamaica.

Subsequent to the publishing of the report the Ministry of Science, Energy and Technology (MSET) embarked on reviewing the results of the NREL Study and defined a new Net Billing Programme that incorporated many of the recommendations from the study, including providing a separate mechanism for non-net billing connections to the electricity grid through mechanisms such as *"Electric Power Wheeling"* and *"Auxiliary Connections."*

On August 27, 2015, the Electricity Act, 2015 came into force establishing the general legal framework for Net Billing, Electric Power Wheeling and Auxiliary Connections and detailed regulations are being developed. Of note is the fact that a Licence is a pre-requisite for any connection to the electric grid.

The objective of this document is to outline the details of the Net Billing, Electric Power Wheeling and Auxiliary Connections Grid-Interconnection Programme, which will feed into several stakeholders' discussions and eventually into the finalization of regulations for Net Billing, Electric Power Wheeling and Auxiliary Connections.

## 4 The Net Billing, Electric Power Wheeling and Auxiliary Connections Grid-Interconnection Programme

### 4.1 Objective:

The Government of Jamaica (GOJ) has developed this programme with the following objectives:

- To facilitate energy sector investments while ensuring transparency, safety, affordability, accessibility, sustainability, continuity, reliability and consumer protection.
- To increase the contribution of renewable energy in the energy supply mix while allowing wide-scale participation of energy sector stakeholders
- To provide self-generators a legal framework that help to secure access to long-term financing as well as to recoup invested capital.

### 4.2 General Features

The programme allows for three (3) types of interconnection facilities to residential, commercial and industrial customers of JPS who intend to become self-generators to Net Bill (to sell their excess generation to the grid) or Power Wheel (to generate their supply in one location and use it or part thereof in another location) or connect for Auxiliary purposes (generating electricity for personal use and not exporting to the electric grid).

The Net Billing, Electric Power Wheeling and Auxiliary Connections Grid-Interconnection facilities have two (2) processes, the Grid-Interconnection Licensing Process and the Contract Process which will be administered by MSET and JPS respectively. Each process will require applicants to submit completed applications with relevant documents for processing and it will be the responsibility of the applicant to ensure that the information presented is accurate and relevant in an effort to mitigate against delays in the processing of a Grid-Interconnection Licence and the Contract for either Net Billing, Electric Power Wheeling or Auxiliary Connection.

The applicant will have access to three (3) separate Grid-Interconnection Licence Application Forms which will be available on MSET, OUR and JPS website. The applicant may choose to apply for either a Net Billing, Electric Power Wheeling or Auxiliary Connection Licence by completing the requisite application form, pay a non-refundable processing fee and submit the completed application form with supporting documents to the MSET and any other information or documentation required by MSET.

Similarly, the applicant will have access to three (3) separate types of standardized contracts which will be available on JPS website and the applicant may choose to enter a contract with the JPS for either a Net Billing, Electric Power Wheeling or Auxiliary Connection arrangement by submitting the completed Standard Offer Contract,

Power Wheeling Contract or Auxiliary Connection Contract to the JPS with the requisite documentation.

Additionally, the applicant will only have access to either the Net Billing, Electric Power Wheeling or Auxiliary Connection facility per location.

### 4.3 Net Billing

The Net Billing facility is for self-generators to sell or be otherwise credited with the value for the excess power generated under standard offer contracts with JPS that have been approved by the Office.

Self-Generators wishing to participate in this facility will be required to apply for a Net Billing Licence and a Net Billing Standard Offer Contract and meet the following minimum eligibility criteria:

- Be a customer of JPS;
- Registered owner(s) of the property or have written permission from owner(s) where electricity generation plant will be constructed;
- Furnish certified Electrical Line Diagram of proposed Renewable Energy System demonstrating system capacity not exceeding 10kW for residential and 100kW for commercial;
- Proof of payment of the non-refundable processing fee to the MSET pursuant to section 9(4) of the Electricity Act.

### 4.4 Electric Power Wheeling

The Electric Power Wheeling facility is for self-generators to provide electricity to the system on terms pursuant to which an equivalent amount of electricity may be used from the system at one or more locations.

Self-Generators wishing to participate in this facility will be required to apply for an Electric Power Wheeling Licence and an Electric Power Wheeling Contract and meet the following minimum eligibility criteria:

- Be a customer of JPS;
- Have an annual average demand in excess of 1MVA;
- Registered owner(s) of the property or have written permission from owner(s) where electricity generation plant will be constructed;
- Furnish certified Electrical Line Diagram of proposed Renewable Energy System or Non-Renewable System;
- Demonstrate system will be "Firm Capacity"; and
- Proof of payment of the non-refundable processing fee to the MSET pursuant to section 9(4) of the Electricity Act.

## 4.5 Auxiliary Connections

The Auxiliary Connections facility is for self-generators who intend on connecting to the grid for a purpose other than electric power wheeling, net billing or generating electricity as an independent power producer, which may include stability purposes.

Self-Generators wishing to participate in this facility will be required to apply for an Auxiliary Connections Licence and an Auxiliary Connection Contract and meet the following minimum eligibility criteria:

- Be a customer of JPS;
- Registered owner(s) of the property or have written permission from owner(s) where electricity generation plant will be constructed;
- Furnish certified Electrical Line Diagram of proposed Renewable Energy System or Non-Renewable System;
- Demonstrate system will be installed with "Blocking Device" to prevent exportation of electricity to the utility grid; and
- Proof of payment of the non-refundable processing fee to the MSET pursuant to section 9(4) of the Electricity Act.

## 4.6 Other Features

There are additional features of the Net Billing, Power Wheeling and Auxiliary Connections Grid-Interconnection Programme, such as:

- All Licences and corresponding standardized contracts will be valid for 10 years, subject to the right of termination provided for in the Contract;
- All applicants with system capacity over 1MW will require from JPS Provisional Approval to Construct;
- All Renewable and Non-Renewable Energy Systems will require inspection by a Licensed Electrical Inspector;
- Net Billing is only available for persons generating electricity from renewable energy sources;
- A special utility meter will be required for Net Billing, Electric Power Wheeling and Auxiliary Connection facilities;
- Rates for Net Billing and Electric Power Wheeling will be developed by the OUR
- While there is a 'floor' of 1MVA for Electric Power Wheeling, there is no 'ceiling' for Electric Power Wheeling and Auxiliary Connections. There is a 'ceiling' for Net Billing, particularly a limit of 10kW for residential and 100kW for commercial customers of JPS;
- All applicants will be required to pay a one-time Use of System Charge to JPS, which will vary according to the capacity of the system and type of facility (Net Billing, Electric Power Wheeling or Auxiliary Connection);
- All applicants will receive a Commissioning Authorization Letter and Commercial Operating Date Letter from JPS after successful construction and commissioning of system;

- All applicants may maintain their own insurance policies to mitigate risk of personal loss or damage to their systems and the JPS' Grid;
- All inverters or electric power devices interconnecting with the utility grid should have anti-islanding or power interrupting features; and
- All Licensed Electrical Inspector will be required to furnish a written report to the applicant on a failed inspection.

## 5 Key Stakeholders and Roles

In order to effectively operate the Net Billing, Electric Power Wheeling and Auxiliary Connections Programme, there will be important roles that key stakeholders are expected to play. Please see Appendix A.

## 6 Licences Administration

The licensing process will commence when the MSET receives a completed application form accompanied by the relevant supporting documents and the payment of the non-refundable processing fee pursuant to section 9(4) of the Electricity Act. The MSET will be responsible for the administering of the licensing process. Successful applicants will be required to pay an additional Licence Fee pursuant to section 9(5)(a)(i) of the Electricity Act.

## 7 Standardized Contract Administration

The Jamaica Public Service Company Limited (JPS) will be responsible for the administering and execution of standardized contracts. The form and content of theses standardized contracts, namely the Standard Offer Contract, the Auxiliary Connection Contract and the Power Wheeling Contract, will first be approved by the OUR.

## 8 Dispute Resolution

Any dispute or disagreement between the Single Buyer and the self-generator relating to any matter shall be submitted to the Office for a determination.

## 9 Certification of Electrical Line Diagrams

The applicant will be required to engage the services of a Licensed Electrical Inspector or an Electrical Engineer certified by the Professional Engineers Registration Board (PERB) to certify electrical line diagrams outlining the proposed system. At a minimum the electrical line diagram should have the following information:

- Generation capacity of the system
- The geographical location of the system
- The name and contact details of the applicant

- A Bill of Material identifying the specification of major devices including the electricity generating device, disconnect switches, inverter(s), blocking device (for auxiliary connections) and the existing JPS meter

All certified electrical line diagram should be approved by a Licensed Electrical Inspector and shall carry the sealed/stamped accordingly.

## 10 Inspection of Self-Generator's System

The applicant will be required to engage a Licensed Electrical Inspector to inspect the system after the construction has been completed. The Licensed Electrical Inspector will be required to prepare an Inspection Report and issue a certificate authorizing the energization of the system.

## 11 Standards for Equipment & Installation

The Bureau of Standards Jamaica will be responsible for the development and publishing of the required standard for equipment and installation.

See Appendix A for an expanded list of key stakeholders and their roles and responsibilities.

## 12 Process Flow for Net Billing, Electric Power Wheeling and Auxiliary Connections Grid-Interconnection

The Application Process for Net Billing, Electric Power Wheeling and or Auxiliary Connections was developed from a holistic perspective considering all stakeholders including financiers who will have a significant impact on the success of the programme.

The table below highlights the process for a Self-Generator (SG) to get a Licence to connect to the national electricity grid and the associated standardized contract. In addition, the table highlight many key stakeholders in the process, however this is not to be viewed as the only stakeholders that will provide support to the process, as there are other stakeholders that will contribute indirectly to the process, such as the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF), Ministry of Local Government (MLG), Ministry of Labour and Social Security (MLSS), Generation Procurement Entity (GPE), Companies Office of Jamaica (COJ), Consumer Affairs Commission (CAC), Development Bank of Jamaica (DBJ), Jamaica Solar Energy Association, Educational Institutions and Renewable Energy Engineers & Technicians (REETs).

| No. | Activity | Submissions | Responsible Person(s) or Entity(ies) | Cost | Time (Business Days) |
|---|---|---|---|---|---|
| **LICENCE APPLICATION** | | | | | |
| 1. | Self-Generator applies to MSET for a Licence | - Licensing Application Form (Net Billing, Auxiliary or Electric Power Wheeling)<br>- Non-refundable processing fee<br>- Proof as Customer of JPS (Customer No. & Premises No.)<br>- Evidence of ownership or permission from property owner<br>- Proposed Electrical Line Diagram of RE/Non-RE System certified by Licensed Electrical Inspector | Self-Generator | Non-refundable Processing Fee | 1 day |
| 2. | MSET receives and processes Application and informs the SG that:<br>a) The application was successful and,<br>b) A Licence fee is to be paid | Letter from MSET | Ministry of Science, Energy & Technology (MSET) | N/A | 20 days |
| 3. | The SG makes payment of the Licence Fee and submit proof of payment to MSET | Proof of Payment | SG | Licence Fee | N/A |
| 4. | MSET prepares Licence and submit electronic copies to the SG, OUR, JPS & GER | Licence | MSET | N/A | 20 days |
| **STANDARDIZED CONTRACT EXECUTION** | | | | | |
| 1. | SG applies to JPS for a Standardize Contract. JPS and the SG will negotiate and agree standardized | Signed Standardized Contract | JPS and SG | N/A | 10 days |

| No. | Activity | Submissions | Responsible Person(s) or Entity(ies) | Cost | Time (Business Days) |
|---|---|---|---|---|---|
| | contract for net billing, auxiliary connections and electric power wheeling. Copies shall be sent electronically to MSET and OUR. | | | | |
| 2. | The SG commence construction. | Construction | SG | Construction Cost | Varies |
| 3. | After construction, the SG should have the facility certified by a Licensed electrical inspector | Inspection Report | SG | Inspection Fee | N/A |
| 4. | SG give JPS written notice that construction and inspection is complete and pays the one time Use of System Charge to JPS | - Letter from SG<br>- Proof of Payment | SG | Use of System Charge | N/A |
| **COMMISSIONING** | | | | | |
| 1. | JPS commissions the facility and provides MSET, SG, OUR and the GER with Commissioning Report including Commissioning Authorization Letter and Commercial Operating Date Letter | Commissioning Report | JPS | N/A | 20 days |

## 13 Appendices

### 13.1 Appendix A – List of Key Stakeholders

| Key Stakeholders | Responsibilities |
|---|---|
| **Ministry of Science, Energy and Technology (MSET)** | • Establishing policies and set RE targets<br>• Developing legislations and regulations<br>• Monitoring and evaluation<br>• Planning<br>• Issuing of Electricity Generation Licences<br>• Maintain registry of all Electricity Licences<br>• Public Awareness |
| **Generation Procurement Entity (GPE)** | • To procure new generation capacity<br>• To issue approval of Renewable Energy supply to the grid after consultation with JPS |
| **Office of Utilities Regulation (OUR)** | • Regulate the electricity sector<br>• Investigation of complaints relating to Electricity Generation Licences<br>• Approve Standardized Contracts Setting rates<br>• Determine the Use of System Charge for net billing, auxiliary connections and electric power wheeling<br>• Apply penalties for underperformance<br>• Public Awareness |
| **Government Electrical Regulator (GER)** | • Recommend the issue of Licences to Electrical Inspectors and electricians including recommending amendments, suspensions and revocations<br>• Regulation of Licensed Electrical Inspectors and electricians<br>• Dispute Resolution between Self-Generators and Licensed Electrical Inspectors<br>• Maintain record of Approved Training Institutions (ATIs) for Licence Electrician and Inspectors<br>• Public Awareness |

| Key Stakeholders | Responsibilities |
|---|---|
| **Bureau of Standards Jamaica (BSJ)** | • Perform testing of Energy Devices<br>• Promulgate a list of approved meters and blocking devices<br>• Public Awareness |
| **Jamaica Public Service Company (JPS)** | • Maintain and operate the electric grid<br>• Conduct initial verification of Applicants<br>• Supply and purchase electricity<br>• Enter into standardized contracts<br>• Provision of Utility Meters and blocking devices<br>• Reporting<br>• Public Awareness |
| **Licensed Electrical Inspectors (LEIs) and electricians with Renewable Energy Certification** | • Inspect installed RE and Non-RE Systems in reference to established codes and standards<br>• Issue certificate to qualified RE and Non-RE Systems<br>• Reporting |
| **Self-Generators (SG)** | • Make application for Licence to net bill, connect for auxiliary purposes and or enter into a wheeling arrangement<br>• Pay non-refundable processing fee, licencing fee and use of system charge<br>• Negotiate and execute standardized contract. |

## 13.2 Appendix B – Fees and Charges

| ENTITY | DESCRIPTION OF FEES | AMOUNT (J$) |
|---|---|---|
| **Ministry of Science, Energy & Technology (MSET)** | Non-refundable processing fee | Refer to Gazette Nos. 129A – G, 2016 |
| **Ministry of Science, Energy & Technology (MSET)** | Licencing Fee | Refer to Gazette Nos. 129A – G, 2016 |
| **Jamaica Public Service (JPS)** | Compensation for costs of conducting initial verification | TBD |
| | Meter Fee and blocking device (if applicable) | TBD |
| | Use of System Charge | TBD |
| **Licensed Electrical Inspectors (LEI)** | Inspection Fee | TDB |