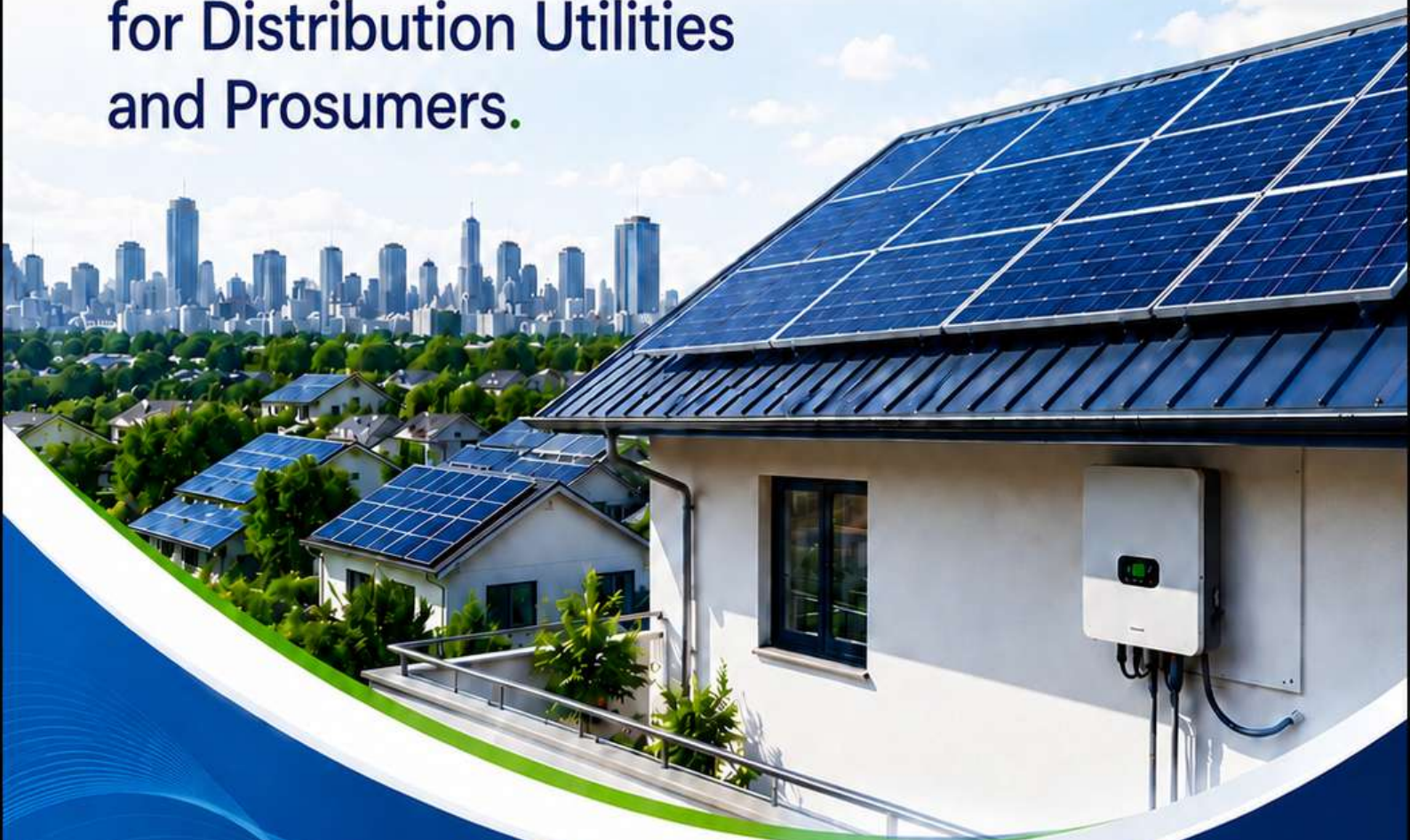


GUIDELINE ON —————●

THE INTERCONNECTION AND OPERATION OF ROOFTOP SOLAR PHOTOVOLTAIC (RTSPV)/BATTERY ENERGY STORAGE (BESS) SYSTEMS

for Distribution Utilities
and Prosumers.



**Public Utilities Commission
of Sri Lanka**

PREFACE

This document serves as a comprehensive guideline for utilities and prosumers in assessing the technical compatibility, regulatory compliance, safety, and installation quality of proposed or installed Rooftop Solar Photovoltaic (RTSPV) systems and Battery Energy Storage systems (BESS) installed at the prosumer premises. It also outlines the standardized procedures to be followed by Distribution Licensees (DLs) for

(1) pre-service (providing clearance and information of any additional financial and non-financial conditions),

(2) interconnection of rooftop PV systems/BESS with the Distribution System, and

(3) Services during the operational period. Additionally, this guideline serves as a reference for prosumers, clarifying the procedural and technical requirements they must follow.

The previous guidelines are repealed with the issuance of this guideline.

The guideline establishes uniform and detailed processes to ensure the protection of consumer rights/Prosumer Rights and Responsibilities, the promotion of high-quality and sustainable rooftop solar PV/BESS installations, and the mitigation of risks associated with non-compliance. Furthermore, it seeks to safeguard the interests of utilities, enhance regulatory transparency, and minimize discriminatory practices and malpractices by any stakeholder involved in the RTSPV/BESS sector.

LIST OF ABBREVIATIONS

AC	Alternating Current
BS	British Standard
BESS	Battery Energy Storage System
DL	Distribution Licensee
DC	Direct Current
DER	Distributed Energy Resources
GOSL	Government of Sri Lanka
ESS	Energy Storage Systems
ECSL	Engineering Council Sri Lanka
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IESL	Institute of Engineers Sri Lanka
LECO	Lanka Electricity Company
NSO	National System Operator
PCC	Point of Common Coupling
PV	Photo Voltaic
PUCSL	Public Utilities Commission
RCD	Residual Current Device
RTSPV	Rooftop Solar PV
THD	Total Harmonic Distortion
TDD	Total Demand Distortion
SPD	Surge Protective Device
SPPA	Standard Power Purchase Agreement
STC	Standard Test Conditions
SLEA	Sri Lanka Electricity Act
SLSEA	Sri Lanka Sustainable Energy Authority

LIST OF DEFINITIONS

Term	Definition
SLEA	The Sri Lanka Electricity Act No. 36 of 2024 (as amended).
Agreement	This agreement and the schedules attached hereto, together with all modifications, amendments, and re-statements expressly made from time to time.
Billing Period	The period for which the Prosumer's electricity meter is read by the Distribution Licensee (DL) and the Prosumer is issued with an electricity bill; usually for a period of one month (i.e. 30 days).
Contract Demand	Maximum apparent power demand agreed to be supplied as declared by the customer.
Commission	The Public Utilities Commission of Sri Lanka (PUCSL) was established under the Public Utilities Commission of Sri Lanka Act, No. 35 of 2002
Generating Facility	The plant and associated equipment, including interconnection, protective, Communication and control equipment, relating to the RTSPV/BESS system located at the Premises, which are used to generate, store, and deliver electrical energy to the Licensee's distribution system.
Export of Electrical Energy	Supply of Electrical Energy by the prosumers using their RTSPV/BESS to the DL's distribution system.
Energy Credit	This shall be the amount of net electrical energy exported to the DL's Distribution System during a specified Billing Period, which amount, measured in kilowatt-hours, shall be credited to the prosumer's electricity account in the subsequent Billing Period.
Functional Roof	Functional Roof refers to a roof that provides a stable, rigid, and safely constructed structure that is weather-resistant, strong, durable, and

	capable of supporting loads while effectively fulfilling its intended purpose, and that has an electricity service connection obtained.
Fixed Charge	The monthly fee levied by the utility provider for making available the electricity supply.
Interconnection facilities	Refer to the infrastructure required to connect an RTSPV/BESS physically and electrically to the DL's Distribution System.
Import of Electrical Energy	Receipt of Electrical Energy by the prosumers from the DL's Distribution System.
Initial Clearance Certification	Refers to the formal written authorization issued by the DL confirming that the proposed RTSPV/BESS system can be accommodated on the DL's Distribution System.
Distribution Licensee	Holder of a license to distribute and supply electricity granted under SLEA.
Maximum demand charge	The charge for the recorded highest level of power demand (measured in kVA over a 15-minute interval integral average) during a Billing Period.
Prosumer	Prosumer means an entity/person that both produces and consumes electricity while connected to the DL's Distribution System under a Rooftop Exemption/License issued by the Commission to generate electricity from an RTSPV/BESS system
Parallel Operation	The operation of the Generating Facility and producing electrical energy at the Prosumer's Premises, while connected to the DL'S Distribution System.
Parallel Operation Date	The date of commencement of Parallel Operation.
Premises	A defined area in which the RTSPV Facility is located, operated, and maintained.

Producer	The entity/person who owns, operates, and maintains a Generating Facility at the Premises under an Exemption/License issued by the Commission
Prudent Electrical Practices	Accepted international practices, standards, and engineering and operational considerations, including but not limited to OEM's recommendations and the exercise of reasonable skill, diligence, foresight, and prudence that would be exercised or generally followed in the operation and maintenance of facilities.
Regulatory Instruments	Relevant regulations, rules, standards, codes, or guidelines currently in place.
RTSPV System	Rooftop Solar Photovoltaic System
Rooftop Solar PV Schemes	Refer to the DL implemented programs or arrangements that enable the interconnection, operation, and billing of the RTSPV system for electricity generation.
Standard Tariff Agreement	The standard agreement for electricity supply to the Premises between the Tariff Customer and the DL is entered into under and in terms of the Act and the Supply Services Code.
Tariff Customer	The DL's customer who has entered into a Standard Tariff Agreement with the DL and has an active tariff account with the Licensee.
Term	The period of commencing from the Parallel operation Date and terminating as per the agreement between DL and the Prosumer.

TABLE OF CONTENTS

PREFACE	1
LIST OF ABBREVIATIONS.....	2
LIST OF DEFINITIONS	3
INTRODUCTION: A BRIEF INTRODUCTION TO THE GUIDELINE.....	7
CHAPTER 1: GENERAL RULES, RIGHTS AND OBLIGATIONS	8
CHAPTER 2: SUBMISSION OF INITIAL CLEARENCE APPLICATION.....	11
CHAPTER 3: GRID CLEARANCE.....	14
CHAPTER 4: SYSTEM INSTALLATION AND COMPLIANCE	16
CHAPTER 5: COMMISSIONING AND GRID CONNECTION	21
CHAPTER 6: BILLING AND PAYMENT PROCEDURES	22
CHAPTER 7: OPERATIONAL REQUIREMENT, PERFORMANCE MONITORING.....	24
CHAPTER 8: SYSTEM DECOMMISSIONING AND TRANSFER OF OWNERSHIP, CAPACITY AUGMENTATION AND RENEWAL OF EXISTING AGREEMENTS.....	26
CHAPTER 9: COMPLIANCE, ENFORCEMENT, AND DISPUTE RESOLUTION	29
CHAPTER 10: BATTERY SYSTEM INSTALLATION AND OPERATION.....	30
CHAPTER 11: ZERO-EXPORT RTSPV/BESS SYSTEMS AND MICROGRID SYSTEMS	31

INTRODUCTION: A BRIEF INTRODUCTION TO THE GUIDELINE

The Government of Sri Lanka has set an ambitious target of achieving 70% of its electricity generation from renewable energy sources by 2030. As identified in the Long-Term Generation Expansion Plan (LTGEP), a significant portion of this capacity requirement is expected to be met through RTSPV installations across the country.

To facilitate this transition, the Government launched the BATTLE FOR SOLAR ENERGY PROGRAM, empowering electricity consumers to generate and utilize electricity on their rooftops. This initiative was originally introduced in 2010 through the Net Metering scheme, which enabled prosumers to export excess electricity to the grid. In support of the Government's renewable energy promotion targets, the initial scheme was subsequently expanded into four distinct options.

- Net Metering,
- Net Accounting,
- Net Plus
- Net Plus Plus/ Net Plus Extra

These schemes allow consumers to select a model that aligns with their electricity usage patterns and financial preferences. Given the growing interest in clean energy and distributed generation, it is anticipated that additional schemes will be introduced or removed/modified/revised in the future to streamline rooftop solar adoption.

This document represents the **Third Edition** of the RTSPV Installation Guideline and has been developed to assist DL and other stakeholders in strengthening and streamlining the existing regulatory and operational framework for **Rooftop Solar PV Systems (RTSPV) and Battery Energy Storage (BESS) Installation**. In its preparation, due consideration has been given to relevant utility internal circulars, prevailing regulatory instruments, government policy targets, and both national and international technical standards and consumer/ prosumer complaints received during the last few years. The document has been prepared with the consultation and consensus of DL and the Sustainable Energy Authority to ensure comprehensive applicability and mutual accountability.

PURPOSE AND SCOPE OF THE GUIDELINE

TO PROVIDE A COMPREHENSIVE FRAMEWORK TO UTILITIES FOR PROCURING ENERGY GENERATED FROM ROOFTOP SOLAR PV SYSTEMS, ENSURING COMPLIANCE WITH TECHNICAL, REGULATORY, AND SAFETY STANDARDS WHILE PROTECTING ALL STAKEHOLDERS.

CHAPTER 1: GENERAL RULES, RIGHTS AND OBLIGATIONS

All Distribution Licensees (DLs), Prosumers/Producers shall comply fully with the provisions of this guideline. Adherence to the procedures, technical requirements, and conditions set forth herein is mandatory, and both DLs and RTSPVs shall ensure that all activities related to RTSPV/BESS are conducted as per this guideline.

- 1.1. The Generating Facility shall adopt one or a combination of the following technical configurations for generating electricity using RTSPV/BESS systems. DL shall ensure that the schemes implemented to facilitate the interconnection of Distributed Energy Resources (DERs) with the grid are aligned with and conform to these configurations.
 - a. One Meter and One Account
Ex: Net metering, Net Accounting
 - b. Two Meters and One Account
Ex: Net Plus, Net Metering, Net Accounting ⁽¹⁾
 - c. Two Meters and Two Accounts.
¹ Ex: Net Plus Plus, Net Plus Extra
- 1.2 Any scheme introduced under the aforementioned technical configurations shall comply with the regulatory tools enforced by the Commission from time to time and shall inform the Commission of its information. Any schemes proposed by the DL out of these technical configurations shall obtain separate prior approval from the Commission.
- 1.3 The License/ exempted persons generating electricity using RTSPV/BESS systems and their authorized contractors shall comply with all terms and conditions stipulated in the Generation License, Statutory exemption/ Trading License or any other Regulatory tool issued by the Commission at the time of interconnection and operation. These terms and conditions are subject to revision by the Commission from time to time, and it is the responsibility of the prosumers/ producers to ensure continued compliance with the applicable provisions.
- 1.4 The entire Generating Facility, including solar panels and other associated accessories such as inverters and protective circuits, shall be located within the Prosumer/Producers' Premises and shall be legitimately owned or occupied by the Prosumer/Producer. Generating facilities should be installed only on actual Functional Roofs, not on the ground or structures erected to add more capacity.

¹ The DL shall allow imported energy to be offset against exported energy during the final settlement process.

- 1.5 The Prosumers/Producers must comply with the conditions imposed by the DL, which are depicted in the SPPA and Interconnection Standard and Guidelines, and written permission should be obtained from the relevant DL before parallel operation.
- 1.6 The Generating Facility shall be intended to meet all or a part of the Prosumer electricity demand (maximum allowable limit is the Contract demand of the Prosumer/Producer) and electrical energy requirements. The generating capacity of a Producer's facility shall not be restricted by the Contract Demand of the consumer. Instead, the permissible capacity shall be determined based on the maximum functional roof area available for the installation of the generating facility, subject to applicable technical, safety, and network constraints as determined by the DL. It shall be the responsibility of the Prosumer/Producer to make correct investment decisions according to the market conditions and availability of the hosting capacity (Grid Clearance).
- 1.7 Interconnection with the Distribution System under the SPPA does not provide the Prosumers/Producers with any rights to utilize the HV/LV Distribution System for the transmission, distribution, or wheeling of electric power to a third party unless the necessary arrangements have been established as per the provisions of the SLEA.
- 1.8 A Prosumers/Producers shall ascertain and comply with any applicable regulations, rules, codes, guidelines, methodologies, and any standard in force that applies to the design, construction, installation, operation, and maintenance, or any other aspect of the RTSPV/BESS system and interconnection facilities.
- 1.9 DL must publish the regulations, rules, codes, guidelines, methodologies, and any standard that applies to the design, construction, installation, operation, and maintenance, or any other aspect of the RTSPV/BESS on its website.
- 1.10 DLs are authorized to disconnect any system found to be non-compliant with the regulations, rules, codes, guidelines, methodologies, and any standard. Any harm or damage to persons or property arising from the RTSPV/BESS system shall be the sole responsibility of the Prosumers/Producers, and the Prosumer/Producer shall be informed in writing the reason for the disconnection and the corrective measures to be completed by the Prosumer/Producer.
- 1.11 DL shall have the right to review the design of the Prosumers/Producers Generating and Interconnection Facilities and to inspect such facilities before and after the commencement of parallel operation with the Distribution System. The Producers/Prosumers may request modifications as necessary to comply with the DL's Interconnection standards.
- 1.12 DL's review and authorization for parallel operation shall not be construed as conforming or endorsing the Prosumer's/Producer's design or as warranting the Generating Facility's safety, durability, or reliability. DL shall not, by reason of such

review or lack of review, be responsible for the strength, adequacy, or capability of such equipment.

- 1.13 The integration of Building Integrated Photovoltaic (BIPV) systems, utilizing solar PV panels as the building's roofing material, is recommended, subject to obtaining prior approval from the DL for the design, which is certified by a relevant accredited certification body.
- 1.14 DL is obliged to take all necessary corrective actions to maintain the statutory voltage levels of the DL's network at normal conditions.
- 1.15 The Prosumers/Producers shall comply with and operate within the operating parameters specified by the DL.
- 1.16 All DLs shall take necessary actions to disseminate the real-time connected capacities/ hosting capacities monthly, categorized by area, by transformer, and make them available online to ease the identification of suitable locations for installing RTSPV/BESS systems.
- 1.17 The use of electronic media throughout the approval and clearance process is highly encouraged.
- 1.18 Inspectors authorized by the Commission and DLs have the authority to conduct inspections of RTSPV/BESS systems to monitor compliance with the applicable safety and quality standards.
- 1.19 The Prosumers/Producers shall comply with all applicable Environmental Laws in Sri Lanka.
- 1.20 All internal circulars issued by the DL on RTSPV/BESS shall align with this guideline and any relevant guidelines/directives issued by the Commission. Any matter falling outside the scope of these guidelines shall be referred to the Commission for prior approval. DLs are encouraged to seek prior recommendations from the Commission for any internal circulars to minimize disputes. DL shall share the relevant circulars with the Commission for information and record purposes.
- 1.21 The DL shall use the Standard Power Purchase Agreements approved by the Commission. DL may include an addendum if required for new schemes to be introduced by the DL, subject to the approval of the Commission.

CHAPTER 2: SUBMISSION OF INITIAL CLEARANCE APPLICATION

DLs shall disseminate this message on their websites and at their office premises to raise customer awareness. **“It is recommended and advisable that the applicant consult a registered solar service provider in SLSEA before submitting the clearance request. The applicant is also advised to adhere to all applicable guidelines, regulations, and standards, including the provisions of this document, to ensure compliance, streamline the approval process, and avoid potential disputes arising throughout the process.”**

2.1 The DL shall publicly make available the following information in Sinhala, Tamil, and English languages on its official website and make it available in Customer Service Centers or relevant premises, in a manner that is easily visible and accessible to the public for awareness and reference purposes. It is recommended to include all the documents in one place on the website.

1. Eligibility Criteria
2. A sample of the initial clearance application form.
The initial application form shall obtain the following information from the applicant, but not limited to,
“Project type, Proposed Generation capacity, Customer information, the details of the existing RTSPV connection within the premises if any, and applicant certification.”
3. A list of required documents in all stages to be submitted to obtain an RTSPV/BESS connection.
4. The formats (in soft and printed versions) of the same documents shall be readily available.
5. Interconnection & Operational standards/guidelines with draft Single Line Diagrams issued by the DL apply to each grid connection voltage level.
Ex: Guideline on Retail RTSPV connection
Guideline on LV bulk RTSPV connection.
Guideline on MV bulk RTSPV connection.
6. Draft SPPA for the interconnection schemes

Applicant Eligibility Criteria.

- I. An active service connection from the DL that has an Electricity Account.
- II. For all one-meter one account and two-meter one account configurations tariff customer shall be the applicant for the RTSPV/BESS connection.
- III. For two-meter two accounts configuration, the tariff customer can be the applicant for the RTSPV/BESS connection. If the applicant is not the Tariff customer of the premises, a recently signed affidavit/Power of Attorney issued by the tariff customer of the premises shall be submitted as required. The

affidavit shall explicitly grant permission to the applicant for the installation of the RTSPV/BESS on the premises for the entire agreement period.

- IV. The applicant shall make all necessary changes related to the existing supply connection (including name change, shifting of meter or any installation changes) before the submission of the RTSPV/BESS application.

2.2 Each application for RTSPV/BESS shall be treated as a new and independent application.

Required Documents for the Initial Application.

- I. Duly filled in the initial clearance application form.
- II. Existing service connection details, where necessary. (Account No./ Distribution Licensee bill)
- III. NIC copy of the applicant.
- IV. Building approval obtained from the local authority if necessary.
- V. The layout of the roof with the intended plant area is marked (for more than 42kVA systems)
- VI. Location map and Sample drawing of the system and structure (if beyond the contract demand)
- VII. Affidavit/Power of Attorney (If the applicant is not the owner/tariff customer of the premises).
- VIII. Technical specifications and certifications requested for the special cases like BIPV.
- IX. Information on existing Rooftop PV systems.

2.3 The potential applicant shall submit an initial application for clearance either through an online platform or by manual submission to the relevant DL operating within the respective geographical area.

2.4 If the applicant requires advisory support regarding the application process, including filling and submission, or on technical requirements, the DL shall provide such guidance, either in writing, on their digital platform, or verbally, as appropriate.

2.5 Upon submission of the application, whether through online or manual means, the applicant shall be issued a unique reference number. (It is advised that the manual applications be entered into the system, and a reference be generated by the same system where the online applications are also accepted). This reference number shall be used to track and follow up on the progress and status of the application.

2.6 All status updates, including acknowledgments and decisions at each stage of the process, shall be communicated to the applicant via SMS to the registered phone number for the Electricity Account for the prosumer or applicant where applicable. The final clearance letter shall be issued in written form, either as a physical letter or via

email, based on the applicant's preference, ensuring that the applicant can retain it as an official record.

- 2.7 At the time of initial application submission, the DL shall ensure that the application form, draft SPPA, applicable Interconnection Standard, along with all relevant technical information, metering requirements, and other necessary documentation, are readily accessible to applicants. These documents shall be uploaded to the DL's official website for easy public access.
- 2.8 The initial clearance processing fee shall be paid at the time of applying for the clearance. The DL shall only charge fees that are duly approved and published by the Commission at the time of application submission. The DL shall allow the applicant to pay the fees in any mode of payment, and the receipt for the payment shall be provided to the applicant.
- 2.9 If the DL is required to conduct more than two site visits before issuing clearance, it may collect a re-inspection fee as approved by the Commission. However, the DL shall ensure that such additional inspections are necessary solely due to the applicant's non-compliance, errors, or misconduct. Inspection report/data must be filed against the applicant and consumer information for later referral.

CHAPTER 3: GRID CLEARANCE

- 3.1 DL shall perform an Initial Review and produce the Initial Clearance Certificate if the requested capacity can be integrated. The maximum acceptable time to provide the Initial Clearance Certificate for retail connections shall be **two (2) weeks** from the date of submission of the duly completed initial application, along with the relevant application fee.
- 3.2 The maximum acceptable time to provide the Initial Clearance Certificate for the bulk connections shall be **three (3) weeks** from the date of submission of the duly completed initial application with the relevant application fee.
- 3.3 If the DL requires additional time for further analysis, the applicant shall be informed in writing. SMS or email, or both mediums, can also be used for this purpose. For those cases, if the case is a retail connection, the decision on the clearance shall be granted within **four (4) weeks** from the receipt of the application. If the case involves a bulk connection, clearance shall be granted within **Six (5) weeks** for **LT bulk connections** and **Eight (8) weeks** for **HT bulk connections** from receipt of the application.
- 3.4 The DL shall establish and maintain streamlined internal coordination among all relevant branches involved in the clearance approval process to ensure adherence to the stipulated timeframes outlined in this guideline.
- 3.5 The DL shall inform the applicant of the grid clearance decision in writing. If the request cannot be accommodated, the DL shall notify the applicant in writing, clearly stating the reasons for rejecting the application. The DL shall maintain a registry for each application request and results to submit to the Commission upon request.
- 3.6 The DL shall establish and implement a mechanism to inform the applicant once the technical barriers that led to the rejection of the grid clearance request have been resolved. Upon resolution, the applicant shall be able to reapply for grid clearance and can be considered as a fresh applicant.
- 3.7 Priority shall be given on a first-come, first-served basis.
- 3.8 The DL shall conduct a site inspection before granting clearance and must be satisfied with the proposed installation plan. Once clearance has been issued, the DL shall not subsequently reject the grid connection based on faults or issues that should have been identified during the grid clearance stage.
- 3.9 The grid clearance issued for a retail RTSPV/BESS system shall be valid for **three (03) months** from the date of issuance. Upon written request by the applicant, the clearance may be extended only once for an additional period of **up to three (03) months**, subject to approval of the DL. The applicant shall submit the extension request **two (02) weeks** before the expiry of the initial clearance period. Such a request shall include valid

justification, supporting documentation, and evidence of progress on the installation. The DL shall assess the request and, if the request is fair and justifiable, issue the extension **before the expiry of the initial clearance.**

- 3.10 The grid clearance issued for a bulk RTSPV/BESS system shall be valid for **six (06) months** from the date of issuance. Upon written request by the applicant, the clearance may be extended only once for an additional period of up to **four (04) months**, subject to approval of the DL. The applicant shall submit the extension request **four (04) weeks** before the expiry of the initial clearance period. Such a request shall include valid justification, supporting documentation, and evidence of progress on the installation. The DL shall assess the request and, if the request is fair and justifiable, issue the extension **before the expiry of the initial clearance.**
- 3.11 If the DL is unable to provide the decision on the extension or any notification before the expiry of the initial clearance for both retail and bulk applications, the initial clearance shall automatically be extended one time for 30 days. The DL shall take all necessary actions to process and issue the decision on the clearance extension within this additional one-month period. The clearance extension shall take effect from the date of issuance of the extension. If the DL is unable to issue the extension, the additional extension periods mentioned above in 3.9 and 3.10 will be automatically granted.
- 3.12 Where both the original clearance and any extension thereof expire before the completion and submission of the RTSPV/BESS system, the applicant shall be required to make a fresh application and obtain new clearance from the Distribution Licensee (DL). No such application shall be accepted for the same premises until six (6) months have elapsed from the expiry date of the last valid clearance.
- 3.12 If the applicant fails to apply for an extension within the time periods specified in Clauses 3.9 and 3.10, the DL shall have the right to reject any subsequent request for an extension and may withdraw the clearance and/or cancel the capacity allocation granted for the premises.
- 3.13 ***No Prosumer or Producer shall commence project works before obtaining the necessary clearance. Any investment or expenditure incurred before the issuance of such clearance shall be entirely at the applicant's risk and shall not entitle the applicant to claim eligibility for any new tariff or preferential tariff treatment.***

CHAPTER 4: SYSTEM INSTALLATION AND COMPLIANCE

- 4.1 The Generating Facility shall be built according to the relevant SLSI standards recommended by SLSEA and rules, regulations, codes, and guidelines issued/approved by the Public Utilities Commission of Sri Lanka and Utility guidelines issued by the DL with the approval of the Commission.
- 4.2 If required, the ***DL shall issue interconnection codes, guidelines, and directives, other than the approved Grid Code and Distribution Code, only after obtaining the approval of the Commission.*** Such codes and guidelines shall be regularly updated and maintained in line with this guideline and shall be included in the Grid Code and Distribution Code by following due process.
- 4.3 The DL may enforce additional functional requirements for any equipment, including inverters, after consultation with the Sri Lanka Sustainable Energy Authority (SLSEA) and the Public Utilities Commission of Sri Lanka (PUCSL). In such cases, a reasonable grace period or notice period shall be provided to ensure compliance. Such enforcements shall be regularly updated in the Grid Code and Distribution Code by following due process.
- 4.4 The DL has the authority to refuse the issuance of the grid connection for installations that do not comply with applicable standards, codes, guidelines, and directives or deviate from the initial proposal submitted by the applicants at the time of grid clearance. Such refusals shall be clarified and communicated to the applicant in written format, highlighting the specific reasons for non-compliance.
- 4.5 The Prosumers/Producers shall make sure that the inverter (s) carry Type Test Certificates as applicable from a third-party accredited laboratory and are registered products under SLSEA.
- 4.6 The Prosumers/Producers shall install all the necessary protective equipment required to ensure the safe and reliable operation of the Generating Facility as per any regulatory instrument, including DL guidelines & directives, and the Prosumers/Producers shall bear all the expenses of installing such equipment and other associated accessories.
- 4.7 The protective function and requirements defined here are designed to protect the DL's Distribution System and not the Generating Facility. The Prosumers/Producers shall be solely responsible for providing adequate protection for their Generating Facility and Interconnection Facilities. The RTSPV/BESS system protective functions shall not impact the operation of other protective functions utilized on DL's Distribution System in a manner that would affect DL's capability of providing **Safe, Quality and Reliable** service to its customers.
- 4.8 Generating Facilities operating in parallel with the Distribution System shall be equipped with the following protective functions to sense abnormal conditions on the DL's

Distribution System and cause the Generating Facility to be automatically disconnected from the Distribution System or prevent the Generating Facility from being connected to the Distribution System inappropriately.

4.8.1. Distribution Licensee Distribution System Parameters are as follows.

Nominal Voltage	33 kV	11 kV	400 V
System Highest Voltage	36 kV	12 kV	440 V
Rated fault current	25 kA	20 kA	20 kA
No. of Phases	3	3	3ph & Neutral
System Frequency	50Hz	50Hz	50Hz
Method of Earthing	Non-Effectively Earthed	Solidly Earthed	Solidly Earthed

- 4.8.2 Over and under voltage trip functions and over and under frequency trip functions, and related settings for the RTSPV inverters to function under normal conditions and during emergencies in system operations shall be as specified by the DL with the approval of the Commission.
- 4.8.3 A voltage and frequency sensing and time delay function to prevent the Generating Facility from energizing a de-energized Distribution System and to prevent the Generating Facility from reconnecting with the DL Distribution System, unless the DL Distribution System service voltage & frequency meet the criteria for reconnection and entering service as specified by the DL with the approval of the Commission.
- 4.8.4 A function shall be available to prevent the Generating Facility from contributing to the formation of an unintended island and cease to energize the Distribution System within a time duration as specified by the DL with the approval of the Commission.
- 4.8.5 The Generation Facility shall provide Voltage Control Operation Mode support as specified by the DL with the approval of the Commission and maintain the Distribution System voltage.
- 4.8.6 The Generating Facility shall support and Ride Through (RT) for faults on the Distribution System as specified by the DL with the approval of the Commission.

- 4.8.7 The Prosumer/Producer should not change any of the above-stated settings or any unspecified settings without written permission from the DL.
- 4.9 The Generating Facility shall be automatically disconnected from the Distribution System as specified by the DL with the approval of the Commission when the DL supply is intentionally or automatically switched off.
- 4.10 Suitable equipment required.
- 4.10.1 The electrical installation of the Generating Facility shall comply with the BS 7671:2018 (IET wiring regulations) or the latest equivalent. Circuit Breakers or other interrupting devices located at the PCC shall be certified by an accredited authority as suitable for their intended operation, if requested by DL. This includes being capable of interrupting the maximum available fault current expected at their location. Prosumer/Producer's Generating Facility should be designed so that the failure of any one device shall not potentially compromise the safety, reliability, and performance of the DL's Distribution System.
- 4.10.2 The Generating Facility parallel device/s shall be capable of withstanding 220% of the Interconnection Facility rated voltage. The Interconnection Facility shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE 1547 – 4.11.2.
- 4.11 Visible disconnect at Point of Common Coupling (PCC)
The Prosumer/Producer shall furnish and install a ganged manually operated isolating switch near the PCC to isolate the Generating Facility from the DL's Distribution System. The device does not have to be rated for load break nor provide overcurrent protection.
- The device must:
- a) Allow visible verification that separation has been accomplished (This requirement may be met by opening the enclosure to observe contact separation).
 - b) Include marking or signage that clearly indicates open and closed positions.
 - c) Be capable of being reached quickly and conveniently 24 hours a day by DL personnel for construction, maintenance, inspection, testing, reading, or operation, without obstacles.
 - d) Be secured in a weather-proof (IP65) enclosure and capable of being locked in the open position to prevent unauthorized or accidental closing.
 - e) Be clearly marked on the submitted single-line diagram and its type and location approved by DL before installation.
- 4.12 Prior to the Parallel Operation or momentary Parallel Operation of the Generating Facility, DL shall approve the Prosumer/Producer's as-built drawings, including protection and control diagrams. Generating Facilities equipped with protective

functions and control schemes previously approved by DL may satisfy this requirement by reference to drawings and diagrams previously approved and certified by a Designer/Contractor and a Consulting Chartered Electrical Engineer.

- 4.13 The measurement of flicker shall comply with the conditions as specified in the latest applicable codes or Guidelines.
- 4.14 All protection schemes shall be operated and maintained by the Prosumers/Producers at their own cost and expense.
- 4.18 Hybrid RTSPV systems shall comply with **SLS1680: 2020 (SAFETY OF HYBRID INVERTER FOR SOLAR PV SYSTEM)**.
- 4.19 The Prosumers/Producers shall ensure that the solar PV installation remains within the boundary of the rooftop. If any structure is erected more than one (1) meter above the roof level to support the installation, such structure shall be certified by a Chartered Structural Engineer/Accredited Certification Body.
- 4.20 The roof slab shall be considered as a rooftop. Installation of RTSPV systems on such slabs shall be permitted, provided that the Prosumers/Producers have personal use of the slab area, and all relevant structural and safety requirements shall be certified by a chartered structural engineer.
- 4.21 The RTSPV system installation shall not have any structural connection to the ground for support purposes. All supporting structures shall be limited to the rooftop area and shall be self-contained or anchored solely to the roof slab or rooftop structure.
- 4.22 The Prosumers/Producers shall ensure unobstructed and safe access to the energy meter and isolator during the design, installation, and operation stages, to facilitate inspections, maintenance, and operational activities by the DL as required.
- 4.23 The Prosumer/Producer shall provide and maintain at his own cost (including communication equipment), real-time communication of the Generating Facility and operational data to the DL throughout the agreement period, ensuring compatibility with the DL's monitoring infrastructure and compliance with all technical standards required by the DL. If there is no continuously established communication, the Generating Facility either may be disconnected or may follow an approved Fallback Mechanism to ensure the Distribution System performance.
- 4.24 The DL is authorized to exercise unrestricted access and direct control over Generation Facility outputs in the event of any emergency situation wherein system security risks are identified, including but not limited to risks affecting grid stability, reliability, or any anticipated disturbance to the load-generation balance of the grid. Upon the receipt of specific instructions under such circumstances, Generation Facilities are to be temporarily curtailed or disconnected from the Distribution System.

- 4.25 A mechanism is to be implemented and maintained to facilitate temporary curtailment or disconnection of the Generation Facility under the above circumstances. Such mechanisms may include, without limitation, enabling controllability options through the service provider's or the OEM's cloud platforms, or through remote-control systems with the approval of the Commission.
- 4.25 The Prosumer/Producer should not change any implemented conditions, settings stated in this guideline, without written permission from the DL, and should maintain them throughout the agreement period.

CHAPTER 5: COMMISSIONING AND GRID CONNECTION

- 5.1 Upon completion of the installation, the Prosumers/Producers shall submit all required documents to the DL in accordance with the requirements specified by the DL, with relevant Type Test reports and a Testing plan for the commissioning. Such testing shall be carried out by an Independent Chartered Electrical Engineer listed by the ECSL, in accordance with the applicable standards and guidelines issued by the Commission, or the latest equivalent applicable standards.
- 5.2 The DL shall review the submitted documents and issue the cost estimate in line with the allowed charges submission of the DL approved by the Commission for grid interconnection within **two (02) weeks for Retail and Four (4) Weeks for bulk Connections** from the date of receipt of the completed submission.
- 5.3 Prosumer shall arrange and complete the compliance inspection, testing and commissioning of the Generating Facility by a Consulting Chartered Electrical Engineer as per IEC 61727 (2004-12), IEEE 1547 – 2018, IEEE 18th Edition of Wiring Regulations or latest available equivalent Standards at Prosumer's/Producers cost and the same shall witnessed by the DL representatives with the presence of the consulted Consulting Chartered Electrical Engineer. Before testing and commissioning, Prosumer/Producer shall develop and submit a written testing plan to DL for its review and acceptance. Where applicable, the test plan shall include the testing procedures published by the Original Equipment Manufacturer (OEM) of the Generation Facility and the interconnection equipment. Facility testing shall be conducted at a mutually agreeable time and test equipment shall have valid calibration certificates at the time of testing.
- 5.4 The DL and the Prosumers/Producers shall enter into the SPPA on the same date as the commissioning of the generating facility. The maximum permissible duration for the installation of the net meter and provision of grid connection, including the execution of the SPPA, shall be **two (02) weeks** for Retail Connections and **Four (4) weeks** for Bulk Connections from the date of receipt of payment for the Interconnection.
- 5.5 Parallel operation of the generating facility with the Distribution System shall be authorized only after the successful completion of commissioning tests.
- 5.6 The DL shall ensure that RTSPV/BESS systems comply with the relevant provisions of the Grid Code, Distribution Code, Supply Services Code, and any other applicable codes, standards, guidelines, or regulatory instruments in force.

CHAPTER 6: BILLING AND PAYMENT PROCEDURES

- 6.1 The applicable tariff for payment in respect of exported energy shall be the tariff duly declared by the Commission and in force at the time initial clearance was granted.

6.1.1 Where an extension of the grid clearance is granted, the applicable Feed-in Tariff shall be the tariff in force on the date the extension is approved. However, where the newly approved tariff exceeds the tariff applicable under the original grid clearance, the original tariff shall continue to apply.

- 6.2 The DL shall promptly install the required meters and metering equipment necessary to implement the RTSPV Schemes, the initial cost of which shall be borne by the Prosumers/Producers. The DL shall prepare estimates based on the allowed charges approved by the Commission at the time of preparation of the estimates.
- 6.2 The DL shall maintain the Distribution System and the metering equipment to supply and accurately meter the electricity usage of the Producer/Prosumer and to accept the electricity generated and exported by the Producer/Prosumer, up to the capacities specified in the applicable Supply Service Agreement and the SPPA.
- 6.3 The DL shall attend to requests made by the Producer/Prosumer for testing the accuracy of meters or metering equipment in accordance with the meter testing guidelines issued by the Commission with respective technical standards.
- 6.4 The DL shall read the Producer/Prosumer's meter at the end of each Billing Period and issue the electricity bill based on the RTSPV Scheme for that Billing Period, after duly accounting for any energy credits carried forward to subsequent Billing Periods from previous Billing Period.
- 6.5 The monthly invoice shall clearly indicate, in kilowatt-hours, the export energy credit carried forward from the previous Billing Period, the energy imported and exported during the current Billing Period, and the export energy credit to be carried forward to the subsequent Billing Period, the export energy that was paid in the current Billing Period, and the rate of payment.
- 6.6 Payments due to the Producer/Prosumer shall be made within thirty (30) days from the date of meter reading of each Billing Period. For retail prosumers and Prosumers with BESS systems, applicable charges shall be calculated based on the difference between the total energy imported and the total energy exported during the Billing Period. For bulk prosumers only with RTSPV system, applicable charges shall be calculated based on net energy consumption, determined as the difference between energy imports and energy exports for daytime. Subject to the Commission's approval, DL may adopt any other method, other than those specified above, as deemed appropriate based on the applicable configuration.

- 6.6 Outstanding dues, penalties, or charges related to the service connection shall not be offset against payments due to the Producer/Prosumer for exported energy.
- 6.7 In the event of a defective meter or any other meter-related issue, the energy estimation methodology issued by the Commission shall be applied for billing and settlement.

CHAPTER 7: OPERATIONAL REQUIREMENT, PERFORMANCE MONITORING

- 7.1 The Producer/Prosumer shall maintain all the equipment downstream of the metering equipment in good operating condition.
- 7.2 The Producer/Prosumer shall allow utility/PUCSL representatives to enter his premises for the inspection of the metering equipment and the Generating Facility and shall promptly attend to and implement any written recommendations or instructions about the Generating Facility.
 - 7.2.1 Any information about generating and/or interconnection facilities provided to DL by a Producer/Prosumer shall be treated confidentially.
 - 7.2.2 A Producer/Prosumer shall operate and maintain its Generating Facility and Interconnection Facilities in accordance with Prudent Electrical Practices.
 - 7.2.3 Utilities may limit the operation or disconnect or require the disconnection of a Producer's Generating Facility from the distribution system at any time with or without notice, in the event of an emergency or to correct unsafe operating conditions. Utilities may also limit the operation or disconnect or require the disconnection of a Producers/Prosumers Generating Facility from the distribution system upon the provision of reasonable notice.
 - 7.2.3.1 To allow for routine maintenance, repairs, or modifications to DL's distribution system.
 - 7.2.3.2 Upon termination of the Interconnection Agreement.
 - 7.2.3.3 If the generating facility operates out of the applicable settings, which affects the power quality of the DL's distribution system.
 - 7.2.3.4 Upon DL's determination that a Producer's Generating Facility is not in compliance with the conditions stipulated in the Agreement
 - 7.2.3.5 Upon prediction of disturbances to the load-generation balance of the grid.
- 7.3 The operational parameters applicable to RTSPV/BESS systems shall be reviewed periodically and reissued by Utility with the approval of the Commission.
- 7.4 The DL and NSO shall, to the extent technically and economically feasible, implement and progressively upgrade real-time monitoring facilities for RTSPV/BESS systems through their Distribution Control Centers and National System Control Centers.
- 7.5 The DL shall mandate the availability, configuration, and activation of volt-var and volt-watt control capabilities of inverters as a compulsory requirement for interconnection of RTSPV systems to the grid, in full compliance with IEEE 1547 and the applicable

provisions of the Grid Code. DL shall adhere to the Distribution Code—specified volt-var and volt-watt settings and shall take necessary measures to make such requirements publicly available, with particular emphasis on awareness among registered solar service providers with support of SLSEA. DL shall ensure that all RTSPV installers have configured and activated the required volt-var and volt-watt power quality response modes at the time of commissioning.

CHAPTER 8: SYSTEM DECOMMISSIONING AND TRANSFER OF OWNERSHIP, CAPACITY AUGMENTATION AND RENEWAL OF EXISTING AGREEMENTS

- 8.1. Upon expiry of the existing agreement, the Prosumer/Producer shall reconnect the RTSPV/BESS system to the Distribution System by following the **prevailing grid connection procedure**, including obtaining fresh initial clearance approval, and shall be subject to the tariff in force at the time of execution of the new agreement. The DL shall ensure that all equipment used in the RTSPV/BESS system at the time of reconnection is new and complies with the latest applicable technical standards and commercially available market specifications.
- 8.2 The DL shall ensure and enforce that only unused (new) equipment is installed for new RTSPV/BESS installations, and that no equipment previously used in any other installation is permitted for such new installations. If the DL detects any such violation, the DL shall refuse to grant grid connection to the RTSPV system /disconnect the grid interconnection until full compliance with the applicable requirements is achieved.
- 8.3 The Prosumer/Producer shall be allowed only one time to change between schemes within the first year from the date of grid connection. Any costs arising from such a scheme change, including metering or system modifications, shall be borne by the Prosumer/Producer. Where a scheme change is granted, the applicable Feed-in Tariff shall be the tariff in force on the date the SPPA was signed.
- 8.4 The DL shall permit the following types of Solar PV installations without the requirement of a functional roof, provided that such installations do not qualify for any payment for exported energy by the DL.
 - (a) Solar PV installations on telecommunication towers, subject to prior approval from the Telecommunication Regulatory Commission of Sri Lanka and certification of the structural design by a Chartered Structural Engineer; and
 - (b) Solar PV installations on greenhouses, subject to certification and approval of the structural design by a qualified engineer.
 - (c) Car Parks with EV charging Stations
- 8.5 Where a Prosumer/ Producer seeks to increase the installed RTSPV capacity, such additional capacity may be permitted only under a scheme developed based on a two-meter–two-account structure for the same premises. A Prosumer/Producer shall be entitled to only one capacity augmentation for a given premises. The additional capacity shall be subject to the applicable tariff rate in force at the time the interconnection clearance for the augmented capacity is obtained. Such capacity augmentation shall further be subject to the maximum functional roof area and full compliance with all applicable safety, technical, and structural standards.

8.6 The utility can evaluate the Prosumer's consumption pattern and shall only approve the extension under the same scheme as a capacity amendment to the original signed agreement, subject to the following conditions.

- If the developer's net energy export over the period of a minimum of the last 6 months is negative or decreased, or
- The developer's import energy reading is increased over the period of a minimum of the last 6 months, or
- The generation capacity of the existing RTSPV system shall be the average generation.
- The Tariff consumer shall provide the details of the increment in consumption. (such as load addition details)

However, capacity enhancements based on predictions of future consumption increments shall not be allowed.

8.7 Permission should be granted to continue the same RTSPV Scheme for the same Prosumer/Producer for shifting the Solar PV system to a different location/address for the balance period, with the issuance of an "Addendum to the Principal Agreement."

8.8 Permission should be granted to change prosumer/Prosumer for the balance period of the original agreement with the issuance of an "Addendum to the Principal Agreement".

8.9 In the event of multiple connections involved in Multi-Story Buildings,

Case 1: If the tariff customer is the respective roof owner, permission should be granted for Solar PV installation for any/all service connections. Accordingly, the whole respective roof area could be utilized for Solar PV.

Case 2: If the tariff customer is not the roof owner, permission for Solar PV should be granted to any tariff customer with the consent of the roof owner. The roof area could be shared on first come first serve basis.

Case 3: If there are multiple owners for the roof, permission should be granted to any tariff customer with the consent of all other owners. The roof area could be shared on first come first serve basis for each connection.

Case 4: For apartments and condominiums, the management cooperation/committee should be allowed to install Solar PV for the service connection of the common area. This applies only to the buildings constructed under the Condominium Act. established under the Apartment Ownership Law, No. 11 of 1973.

Case 5: Any cases involving multiple connections, other than those provided above, shall be referred to the DL. Where necessary, the DL may refer such cases to the Commission for determination of a feasible solution on a case-by-case basis.

Note: Consents required for the above cases need to be submitted by an applicant with an affidavit signed by other owners for the roof and certified by a Justice of the Peace/Attorney at Law to avoid issues. (The consumers can utilize the total roof area until full utilization without limiting to the contract demand; service upgrades, if needed, should be facilitated by the utilities)

CHAPTER 9: COMPLIANCE, ENFORCEMENT, AND DISPUTE RESOLUTION

- 9.1 The Chartered Electrical Engineer will bear full responsibility for ensuring the safe installation of the RTSPV/BESS system. A Chartered Engineer's certification is mandatory before the system's interconnection with the grid.
- 9.2 The DL shall submit the progress of RTSPV/BESS development to the Commission on a biannual basis, in the format prescribed by the Commission.
- 9.3 The DL shall ensure that RTSPV installations are operated in accordance with the requirements of the DL. In the event of any violation of these provisions, the DL shall take the necessary actions to rectify and resolve the matter in accordance with the applicable rules and procedures. The DL shall maintain all relevant records and documentation and make such records available to the Commission upon request.
- 9.4 The DL shall accept complaints from prosumers, issue a complaint reference number, provide a response within fourteen (14) days or request an extension of a further fourteen (14) days if necessary, and if the complaint remains unresolved or the response is unsatisfactory, the matter may be escalated to the Public Utilities Commission of Sri Lanka (PUCSL) and shall be resolved in accordance with the respective procedures approved by the Commission

CHAPTER 10: BATTERY SYSTEM INSTALLATION AND OPERATION

- 10.1 BES Systems integrated with RTSPV systems shall comply with all applicable provisions of this Guideline unless otherwise specifically exempted under this Chapter.
- 10.2 The DL shall process all applications related to BESS installations on a first-come, first-served basis, irrespective of whether the application relates to an existing RTSPV system with BESS integration or a new RTSPV system integrated with BESS.
- 10.3 SPPA entered into for Battery Energy Storage Systems (BESS) shall be treated separately from the principal RTSPV SPPA and shall be limited to a maximum of years for the agreement period for the BESS as determined by the Commission at each FiT determination.
- 10.4 The Prosumer shall ensure that the installation, operation, commissioning, maintenance, and decommissioning of the BESS are carried out in accordance with the applicable Code of Practice issued by the Sri Lanka Standards Institution (SLSI) and enforced by the Commission.
- 10.5 Hybrid generating facilities integrated with BESS shall be equipped with an external back-feed protection scheme to prevent hazardous voltage or current back-feed to the DL's Distribution System during power interruptions.
- 10.6 The Prosumer shall only be permitted to export energy from the BESS system during the time periods determined by the Utility with the approval of the Commission from time to time, based on prevailing grid requirements and system conditions.
- 10.7 The maximum payable export energy from an RTSPV system integrated with BESS shall be limited to a monthly energy equivalent of **1.25** times the installed RTSPV system capacity calculated at a plant factor of sixteen percent (16%). (Ex: for a 5 kW RTSPV system, the total Monthly Generation is 600kWh with 4 kWh/kW standard generation. Therefore, the maximum exports allowed from a 5kW RTSPV/BESS system per month is 750kWh.)
- 10.8 The DL shall implement real-time monitoring and control facilities for BESS installations. The Prosumer/Producers shall provide the Utility with the necessary access to such monitoring and control facilities through the inverter, Energy Management System (EMS), or any other interface as required by the Utility.
- 10.9 The DL shall obtain prior approval from the Commission for inverter configurations, protection settings, operational parameters, and any other technical requirements applicable to BESS-integrated RTSPV systems.
- 10.11 BESS installations with a capacity greater than 7 kW shall be connected to the grid through a three-phase connection. However, the DL, with the approval of the

Commission, may specify alternative connection requirements based on technical and operational considerations.

CHAPTER 11: ZERO-EXPORT RTSPV/BESS SYSTEMS AND MICROGRID SYSTEMS

- 11.1 Distribution Licensees shall permit the connection and operation of RTSPV systems and Microgrid (MG) systems operating under zero-export arrangements as captive generation facilities, subject to compliance with applicable technical requirements.
- 11.2 DL shall prepare the technical and safety requirements for the interconnection and interconnection agreement to facilitate the zero-export mechanism and shall be required to obtain the approval of the Commission.
- 11.3 DL shall publish the maximum allowable export capacity applicable to controlled export RTSPV/BESS systems to facilitate self-consumption arrangements.
- 11.4 Captive generators of 100kW and above shall obtain the required licence from the Commission in accordance with the applicable Licensing Regulations.
- 11.5 Such systems shall comply with the Grid Code, Distribution Code, applicable technical standards, and any other requirements approved by the Commission.
- 11.6 Any person installing or operating a zero-export RTSPV or Microgrid system shall notify the respective DL and submit the information required by the DL.
- 11.7 Where a separate electricity generation facility exports electricity to the grid, the captive generation system shall be electrically segregated from the exporting system. Parallel operation shall only be permitted upon certification by a Chartered Electrical Engineer confirming compliance with the applicable technical requirements.
- 11.8 Zero Exporting RTSPV, BESS, or Microgrid systems with an installed capacity on or above 100 kW shall be equipped with monitoring facilities capable of providing operational data to the DL in the format specified by the DL.