SCHEDULE 15

STANDARD TECHNICAL CONDITIONS, HOSTING CAPACITY INFORMATION, AND SHORT-FORM SYSTEM IMPACT STUDY CONFIRMATION FOR ELIGIBLE INTERCONNECTED SOLAR PV AND BATTERY MINI-GRIDS

To form part of the Mini-Grid Regulations, 2025

1. Purpose and Application

1.1 This Schedule prescribes the standard technical conditions applicable to an eligible interconnected solar photovoltaic and battery mini-grid seeking to rely on the simplified interconnection pathway under section 9 of the Mini Grid Regulations 2025.

1.2 This Schedule applies only to interconnected mini-grids based on solar photovoltaic generation and battery energy storage systems, including a project transitioning from isolated to interconnected status where the project seeks to rely on the Short-Form SIS pathway.

1.3 This Schedule does not displace the need for compliance with applicable health and safety requirements, environmental screening, metering, inspection, commissioning, energization approval, or any other applicable requirement under the Mini Grid Regulations 2025 or any relevant code.

1.4 Nothing in this Schedule creates deemed energization approval, deemed safety clearance, or waiver of any applicable technical requirement.

2. Interpretation

2.1 In this Schedule, unless the context otherwise requires—

"***Battery energy storage system"*** or "BESS" means a battery-based electricity storage system including the battery cells, battery management system, inverter or converter, and associated protection, control, and isolation equipment;

"Eligible project" means a proposed interconnected solar photovoltaic and battery mini-grid that satisfies the qualifying conditions in this Schedule and may therefore rely on a Short-Form SIS Confirmation;

"Hosting Capacity Information" or "HCI" has the meaning assigned to it in the Mini Grid Regulations 2025;

"Managed export project" means an eligible project permitted to export electricity at the PCC subject to dynamic or time-varying limits, communications, or control instructions approved by the Commission;

"Limited export project" means an eligible project permitted to export electricity at the PCC up to a fixed approved export limit;

"non-export project" means an eligible project that may import electricity from the Distribution Licensee where permitted but is not authorised to export electricity into the Distribution Licensee's network during normal operation except to the extent expressly permitted for testing, meter tolerance, or transient events;

"Short-Form System Impact Study Confirmation" means the standard written confirmation, in the form prescribed in this Schedule or otherwise approved by the Commission, confirming that an eligible project satisfies the simplified interconnection pathway based on applicable Hosting Capacity Information, the project's single-line diagram, and conformity with the standard technical conditions in this Schedule.

3. General Principles

3.1 Proportionality: the level of technical review shall reflect the size, technology, export behavior, and system risk of the project.

3.2 non-discrimination: equivalent projects on equivalent feeders should be subject to equivalent technical treatment.

3.3 Feeder transparency: Hosting Capacity Information should be sufficiently informative to permit developers to assess likely eligibility before full application.

3.4 Safety first: no simplified pathway shall compromise safety, protection coordination, or the integrity of the affected network.

3.5 PCC discipline: the PCC is the technical and commercial boundary for interconnection review, metering, and settlement.

3.6 Nigerian market realism: this Schedule recognizes stressed feeders, variable data quality, routine outages, and the need for simple but robust connection standards in Nigeria.

4. Eligibility for the Short-Form System Impact Study Pathway

4.1 A project may rely on the simplified pathway only where all the conditions in this paragraph are satisfied.

4.2 The project shall be inverter-based and shall not rely on synchronous generation operating in parallel with the Distribution Licensee's network under the simplified pathway unless specifically authorized by the Commission.

4.3 The project shall have one clearly identified PCC and shall connect through a radial feeder arrangement.

4.4 The applicable Hosting Capacity Information shall show sufficient available capacity for the proposed import profile and, where relevant, export profile at the PCC.

4.5 The project shall conform to the applicable operating mode and standard technical conditions prescribed in this Schedule.

4.6 The project shall not require major network reinforcement, meshed-network studies, or complex protection redesign beyond the standard protection package and minor connection works.

4.7 The project shall provide a single-line diagram, equipment schedule, protection schedule, metering arrangement, and site layout sufficient to confirm conformance with this Schedule.

4.8 The Commission or the Distribution Licensee may require a full SIS notwithstanding apparent eligibility where feeder conditions, power quality, protection, reverse power flow, or operational coordination risks are not adequately addressed by the simplified pathway.

5. Operating Modes for Eligible Projects

5.1 An eligible project shall operate in one, and only one, of the following operating modes:

(a) Non-Export Interconnected Project;

(b) Limited Export Interconnected Project;

(c) Managed Export Interconnected Project.

5.2 A non-export project may use solar photovoltaic generation and battery storage to serve its customers and may import electricity from the Distribution Licensee where permitted, but it shall not export electricity to the Distribution Licensee's network during normal operation.

5.3 A limited export project may supply its own customers and may export electricity to the Distribution Licensee's network only up to the fixed approved export limit stated in the Hosting Capacity Information, permit, Tripartite Agreement, or Commission direction.

5.4 A managed export project may export electricity to the Distribution Licensee's network subject to dynamic or time-varying limits, communications requirements, or operating instructions approved for the relevant feeder.

5.5 The approved operating mode of the project shall be stated in the permit, the Short-Form SIS Confirmation, and the Technical and Commercial Annex in Schedule 10.

6. General Technical Conditions Applicable to All Eligible Projects

6.1 The technical, ownership, protection, metering, and commercial boundary at the PCC shall be clearly identified and reflected in the single-line diagram and Tripartite Agreement.

6.2 The simplified pathway assumes a radial feeder arrangement. Projects involving looped or meshed network effects shall be referred for a fuller study.

6.3 Inverter-based resources shall use equipment listed or certified to recognised standards acceptable to the Commission or the competent inspection authority and shall be capable of anti-islanding and such voltage, frequency, reactive power, ramp-rate, and communications functions as may be required for the relevant operating mode.

6.4 The project shall be designed not to cause unacceptable harmonics, flicker, voltage unbalance, or rapid voltage change at the PCC and shall comply with applicable limits in the Distribution Code and manufacturer-recommended operating ranges.

6.5 The project shall include the minimum protection package in Appendix 1 and any project-specific settings directed by the Distribution Licensee or approved by the Commission.

6.6 Import and export metering at the PCC shall comply with the Metering Code, the interconnection agreement, and any applicable commercial methodology.

6.7 The operator shall nominate control and maintenance contacts and comply with outage-notification and emergency-isolation arrangements agreed under the Tripartite Agreement.

7. Minimum Protection, Metering, and Communications Requirements

7.1 At a minimum, the interconnection shall provide over-voltage, under-voltage, over-frequency, under-frequency, anti-islanding, overcurrent or earth-fault protection, and an isolating device capable of safe disconnection at or near the PCC.

7.2 Where export is permitted, the project shall include control logic and settings sufficient to respect approved export limits, prevent unstable reverse power flow, and coordinate with the feeder protection philosophy.

7.3 Protection settings shall be submitted in the Short-Form PCC Confirmation and shall be subject to validation by the Distribution Licensee.

7.4 The Distribution Licensee shall provide PCC metering adequate for import measurement and, where applicable, export measurement.

7.5 Export-enabled projects shall provide interval data sufficient for settlement and operational review.

7.6 The Mini-Grid operator may install a check meter, but the primary meter for settlement shall be the approved PCC meter unless otherwise approved by the Commission.

7.7 Non-export projects shall require only basic contact and alarm arrangements unless the Commission directs otherwise.

7.8 Limited export projects shall require remote visibility of PCC meter data, breaker status, and plant availability alarms.

7.9 Managed export projects shall require enhanced communications, including remote setting capability, event logs, and telemetry reasonably necessary for safe operation.

8. Battery-Specific Requirements

8.1 The battery system shall include a battery management system, emergency isolation arrangement, manufacturer-approved operating limits, and fault or alarm indication.

8.2 Battery rooms or enclosures shall comply with applicable health and safety, ventilation, fire, earthing, labelling, and emergency-response requirements under the Mini Grid Regulations 2025 and any applicable inspection requirement.

8.3 The project shall submit the battery datasheet, operating envelope, short-circuit contribution statement where relevant, and control philosophy for charge and discharge relative to import and export behaviour at the PCC.

8.4 For export-enabled projects, the battery dispatch logic shall be described clearly enough to enable the Distribution Licensee and the Commission to understand whether the battery is intended for backup, energy shifting, peak support, export shaping, or multiple functions.

9. Hosting Capacity Information and Minimum Data Requirements

9.1 The Hosting Capacity Information shall be feeder-level information published by the Distribution Licensee in the form approved by the Commission.

9.2 In addition to the minimum fields required by the Mini Grid Regulations 2025, the Distribution Licensee should, where available, publish the date of issue, date of last update, feeder status, indicative import capacity, indicative export headroom, major known deficiencies, and any standard conditions or exclusions relevant to interconnection on that feeder.

9.3 The Hosting Capacity Information remains indicative only and does not, by itself, create a right to connect. However, where such information is published and remains current, it shall be the primary basis for determining whether the simplified pathway is available.

10. Short-Form System Impact Study Confirmation

10.1 The Short-Form System Impact Study Confirmation is a structured engineering and regulatory declaration that the proposed project conforms to the applicable operating mode and that feeder-level Hosting Capacity Information supports the requested interconnection.

10.2 The Short-Form Hosting Capacity Information Confirmation shall be signed by a competent person designated by the mini-grid developer and agreeable to the Distribution Licensee, and accompanied by the documents listed in Appendix 2.

10.3 The Distribution Licensee shall review the Short-Form System Impact Study Confirmation only to the extent necessary to determine whether the project conforms to this Schedule, whether the Hosting Capacity Information supports the interconnection, and whether any limited project-specific condition or rectification is required.

10.4 The Short-Form System Impact Study Confirmation shall contain, at minimum, the project identity, location, feeder and PCC reference, technology description, installed capacities, single-line diagram, site layout, protection schedule, metering arrangement, declared import and export mode, evidence that the Hosting Capacity Information remains current for the feeder, and a declaration of compliance with this Schedule and the Distribution Code.

11. Cases Requiring a Full System Impact Study

11.1 A full System Impact Study shall be required where any of the following applies:

(a) the project has multiple PCC or a materially complex feeder arrangement;

(b) the project proposes parallel operation of synchronous generation with the Distribution Licensee's network;

(c) major reinforcement, network reconfiguration, or protection redesign appears necessary;

(d) the Hosting Capacity Information is unavailable, stale, materially incomplete, or contradicted by known feeder conditions;

(e) the project seeks export beyond the feeder's indicated capability or seeks unrestricted export on a stressed feeder;

(f) the project raises unresolved concerns on voltage profile, short-circuit contribution, reverse power flow, harmonics, flicker, or protection coordination;

(g) the project falls outside the capacity band or technical envelope of the standard technical conditions prescribed in Schedule 15 to these Regulations;

(h) the Commission or the Distribution Licensee identifies any site-specific technical risk that cannot reasonably be addressed through a short-form review.

12. Review Outcome and Conditions

12.1 On review of a Short-Form SIS Confirmation, the Distribution Licensee may confirm that the proposed interconnection is acceptable as submitted, acceptable subject to stated conditions, or not acceptable under the simplified pathway.

12.2 Any condition imposed shall be specific, proportionate, and reasonably necessary for safety, metering integrity, operational coordination, or power quality.

12.3 Refusal of the simplified pathway shall be stated in writing with sufficient technical reasons to enable the developer to understand whether a full SIS, limited rectification, or a different feeder or operating mode is required.

13. Relationship with Schedule 10 and Project Documents

13.1 Where a project relies on section 9 of the Mini Grid Regulations 2025, the Mandatory Technical and Commercial Annex in Schedule 10 shall identify the approved operating mode and any approved deviation from the standard technical conditions prescribed in Schedule 15 to these Regulations.

13.2 The Tripartite Agreement, Interconnection Agreement, and permit shall remain the authoritative project-specific instruments for operating conditions, protection settings, outage coordination, metering, and communications obligations.

13.3 Nothing in this Schedule prevents the Commission from imposing additional project-specific conditions in the permit or approved contracts where feeder conditions or system security so require.

14. Compliance, Inspection, and Review

14.1 A project approved through the simplified pathway shall be subject to inspection, testing, and energization approval requirements applicable under the Mini Grid Regulations 2025, any applicable inspection requirement, and any direction of the Commission.

14.2 If a project is found, before or after energization, not to conform materially to the Approved Operating Mode or standard technical conditions relied upon, the Commission may direct corrective action, require a fuller study, suspend export, or take such other regulatory action as it considers appropriate.

14.3 The Commission may revise the prescribed forms, templates, and appendices from time to time, having regard to technological development, field experience, the Distribution Code, and the needs of the Nigerian electricity market.

APPENDIX 1

Minimum Standard Conditions Matrix

Item	Non-Export Project	Limited Export Project	Managed Export Project	Mandatory	Notes
Single PCC	Yes	Yes	Yes	Yes	Projects with multiple PCCs fall outside the simplified pathway.
Radial feeder only	Yes	Yes	Yes	Yes	Looped or meshed network effects require case-specific review.
Solar PV + battery	Yes	Yes	Yes	Yes	Other technologies may be added by later Commission order.
Synchronous generation in parallel with DisCo network	No	No	Case-specific	Yes	If proposed, a full study is ordinarily required.
Routine export	No	Limited only	Managed only	By operating mode	Export mode must match approved limits and control settings.
Standard protection package	Yes	Yes	Yes	Yes	See Appendix 2 checklist.
PCC import meter	Yes	Yes	Yes	Yes	Primary meter for settlement unless

					otherwise approved.
PCC export meter	Not required	Required	Required	If export enabled	May be combined or separate depending on approved metering solution.
Remote visibility	Optional	Required	Required	By operating mode	At minimum for export-enabled projects.
Major reinforcement	Not required	Not required	Case-specific	No	If required, the full study path is ordinarily triggered.

APPENDIX 2

Short-Form System Impact Study Confirmation Template

This template shall be completed by the developer and signed by a competent technical signatory. The Distribution Licensee shall complete Section H following review.

A. Project Identification and Application Details

Field	Information to be completed
Project name / reference	
Mini-grid developer / permit applicant	
Project location (State / LGA / Community)	
Project type	Solar PV only / Solar PV + BESS / BESS-supported IMG / Other
Installed PV capacity (kWp / MWp)	
Installed battery capacity (kWh / MWh) and inverter rating	
Requested date of interconnection/energization	

Name, title, and contact details of the responsible technical signatory	

B. Feeder, PCC, and Interconnection Data

Field	Information to be completed
Distribution Licensee	
Supplying substation	
Feeder name/feeder code	
Voltage level at PCC	
PCC reference / pole / RMU / transformer / location marker	
Radial feeder confirmation	Yes / No
Existing Hosting Capacity Information publication reference and date	
Requested import capacity at PCC (KW/ MW)	
Requested export capacity at PCC (kW/ MW), if any	

C. Approved Operating Mode

Field	Information to be completed
Selected operating mode	Non-Export / Limited Export / Managed Export
Reason the selected operating mode applies	
Any project-specific deviation requested	None / Yes — describe
Does the project require a full SIS instead of the short-form route?	No / Yes — explain

D. Generating Plant and Battery Characteristics

Field	Information to be completed
PV module manufacturer / model	

Total inverter AC rating	
Battery manufacturer / model	
Battery usable energy capacity	
Battery discharge duration at rated output	
Standby generator behind mini-grid	None / Yes — describe
Normal operating mode	Import only / Import + no export / Import + limited export / Managed export

E. Protection, Metering, and Communications

Field	Information to be completed
Anti-islanding provided	Yes / No
Voltage and frequency protection provided	Yes / No
Export limiting control provided	Not applicable / Yes
PCC metering arrangement	
Check meter proposed	No / Yes
Communications/telemetry arrangement	
Operating contact for outage coordination	

F. Hosting Capacity Information Basis and Key Assumptions

Field	Information to be completed
Does published Hosting Capacity Information show sufficient available capacity?	Yes / No
Known feeder limitations identified in Hosting Capacity Information	
Assumed import limit used in review	
Assumed export limit used in review	

Any reinforcement or protection modification required	No / Yes — describe
Basis for concluding project fits short-form pathway	

G. Developer Technical Declaration

Declaration item	Confirmation
The project information in this form is accurate and complete.	Confirmed / Not confirmed
The project conforms to the approved operating mode and the applicable standard technical conditions in Schedule 15.	Confirmed / Not confirmed
The submitted single-line diagram, layout, equipment schedule, and protection schedule are current and consistent with this form.	Confirmed / Not confirmed
The project will comply with the Distribution Code, Metering Code, applicable safety requirements, and Commission directions.	Confirmed / Not confirmed
Name/signature/date of competent technical signatory	

H. Distribution Licensee Review Outcome

Field	Distribution Licensee entry
Short-form SIS status	Accepted / Accepted with conditions / Rejected
If accepted with conditions, state the conditions	
If rejected, state specific technical reasons	
Additional information required, if any	
Reviewer name, title, signature, and date	

Short-Form System Impact Study Confirmation – Minimum Submission Checklist

Submission Item	Required for all operating modes?	Notes
Application cover letter	All	Identify feeder, PCC, and requested review path.
Single-line diagram	All	Shall clearly show PCC, metering, protection, PV, battery, controller, and any backup source.
Site layout	All	Include switchgear, battery enclosure, earthing, access, and emergency isolation points.
Equipment schedule and datasheets	All	PV modules, inverters, battery, protection devices, breakers, meters, plant controller.
Protection schedule and proposed settings	All	Provide functions and setpoints proposed for validation.
Battery control philosophy	All	Explain backup, charge/discharge, import/export, and any islanded operation logic.
Hosting Capacity Information reference	All	Identify Hosting Capacity Information issue date and feeder record relied upon.
Export limit declaration	Export-enabled only	State no export, fixed export limit, or managed export control.
Communications description	Export-enabled only	Describe meter visibility, telemetry, alarms, remote setpoints where applicable.

Competent person declaration	All	Signed by responsible engineer or competent technical representative.

APPENDIX 3

Minimum Hosting Capacity Information Template

This template shall be published by each Distribution Licensee in the form approved by the Commission and updated at the frequency directed by the Commission.

A. Publication Metadata

Field	Information to be completed by Distribution Licensee
Distribution Licensee	
Publication reference/version number	
Date of publication	
Period of validity	
Responsible office/contact for clarification	

B. Feeder-Level Hosting Capacity Information Table

Feeder Name / Code	Supplying Substation	Voltage Level	Network Type / Radial Status	Indicative Import Capacity at PCC	Indicative Export Capacity at PCC	Applicable Operating Mode Supported	Known Operational / Protection Limits	Standard Interconnection Conditions	Date Last Updated

C. Minimum Field Notes and Assumptions

Field / Topic	Required description
Indicative Import Capacity at PCC	State the approximate maximum additional import capability that may be accommodated at the referenced feeder location under normal planning assumptions.
Indicative Export Capacity at PCC	State the approximate maximum export capability that may be accommodated without triggering a full SIS, subject to project conformance with the applicable operating mode and the standard technical conditions prescribed in Schedule 15 to these Regulations.
Applicable Operating Mode Supported	State whether the feeder is suitable for non-export only, limited export, or managed export, and identify any capacity band, operating restriction, communication requirement or control condition attached to that classification.
Known Operational / Protection Limits	State any known reverse power flow limitations, protection constraints, voltage concerns, reliability concerns, or operating restrictions relevant to interconnection.
Standard Interconnection Conditions	State any standard requirements for metering, telemetry, breaker type, export limiter, PCC arrangement, outage coordination, or testing that ordinarily apply on the feeder.
Validity of Hosting Capacity Information	State the period for which the Hosting Capacity Information is considered current, after which the Distribution Licensee may require refreshed confirmation.
Basis of Values	State whether the published values are based on studies, feeder data, planning assumptions, historical loading, engineering

	estimates, or other Commission-accepted basis.
Important Caveat	State that the Hosting Capacity Information is indicative and does not of itself create a right to connect or energise, but may support the simplified pathway where the project conforms to the applicable operating mode and technical conditions.
Update Frequency	State the minimum frequency of update and the trigger for unscheduled revision where feeder conditions materially change.

D. Use of the Template

The Distribution Licensee shall publish the feeder-level table in an editable and searchable format approved by the Commission. Each row shall correspond to a distinct feeder or clearly defined feeder segment relevant to mini-grid interconnection planning.

Where the Distribution Licensee does not have sufficient feeder-level data to populate a field precisely, the field shall be completed using the best available engineering estimate together with a note on the basis used and any material limitation of that estimate.

Minimum Hosting Capacity Information Template – Field Summary

Field	**Minimum / Optional**	**Guidance**
Feeder name/code	Minimum	Use the official feeder identifier used by the Distribution Licensee.
Voltage level	Minimum	Specify LV, 11 kV, 33 kV, or other approved class.
Supplying injection substation	Minimum	Where applicable.
Date issued/updated	Minimum	State the date of last update and validity horizon.
Indicative import capacity at PCC	Minimum	May be stated as feeder-level indicative capacity subject to site confirmation.

Indicative export headroom	Optional but recommended	Especially important where the simplified export pathway is contemplated.
Known operational limitations	Minimum	For example, protection deficiency, chronic low voltage, overload constraints, or outage constraints.
Standard interconnection conditions	Minimum	Any standard restrictions, settings, export caps, telemetry expectations.
Existing embedded generation / IMG	Optional but recommended	Useful for cumulative penetration assessment.