RESOURCE HUB | THE ENERGY ACADEMY

Commissioning Checklist for Commercial Solar

62 items across 8 sections.

PROJECT

LOCATION

COMMISSIONED BY

DATE

Tick each item when it is verified. Write N/A where an item does not apply to your project, and use the right-hand column for notes, owner and due date.

1 Documentation and Readiness Before Testing Begins

NOTES / OWNER / DUE

Commissioning against an unknown design is not commissioning. Before anyone opens a combiner box, confirm you have the approved documents and that the system in front of you matches them. This step also decides whether the turnover package will still be usable in five years.

☐ 1.1	Confirm the stamped, permitted design set is on site and matches the current revision	
☐ 1.2	Verify red-line as-built drawings exist and reflect field changes made during construction	
☐ 1.3	Confirm the string map identifies every string by combiner, fuse position and physical location	
☐ 1.4	Verify module, inverter and racking submittals match the equipment actually installed, including serial number ranges	
☐ 1.5	Confirm the electrical permit is open and the authority having jurisdiction inspection is scheduled	
☐ 1.6	Verify the interconnection agreement is executed and any pre-energization utility conditions are satisfied	
☐ 1.7	Confirm the approved inverter grid-support settings and the source of that approval	
☐ 1.8	Collect module and inverter warranty registrations and confirm they name the correct owner entity	
☐ 1.9	Confirm a lockout and tagout procedure and an emergency response plan are in place for the energization work	

2 Mechanical and Structural

NOTES / OWNER / DUE

Mechanical defects found at commissioning are cheap to correct and nearly impossible to correct later without disassembly. This section matters most on rooftops, where an attachment problem becomes a roof leak and a warranty dispute involving parties who were never part of the solar contract.

☐ 2.1	Confirm the roof warranty holder inspected and approved the attachment method and issued written acceptance	
☐ 2.2	Verify structural attachment spacing and fastener type against the approved structural drawings	
☐ 2.3	Confirm ballast placement matches the ballast layout drawing, including any wind-zone variations at edges and corners	

2 Mechanical and Structural

			NOTES / OWNER / DUE
☐	2.4	Verify module clamp torque on a documented sample and record the values	
☐	2.5	Confirm tracker rows move through full range of motion without interference and reach stow position	
☐	2.6	Verify no module is damaged, cracked, or installed with a visible defect, and document any that are before energization	
☐	2.7	Confirm array-to-array and array-to-obstruction clearances match the shading analysis used for the production model	
☐	2.8	Verify roof penetrations are flashed and sealed and that the roofer has signed off	

3 DC Electrical Verification

The DC side is where most commissioning findings live, because it has the largest number of identical connections made by hand. Test every string rather than sampling. A reversed polarity or open connector found now is a five-minute fix; found later it is a truck roll and a lost season.

			NOTES / OWNER / DUE
☐	3.1	Verify open circuit voltage on every string and compare against the calculated value for the measured cell temperature	
☐	3.2	Confirm polarity on every string before any connection is made to a combiner or inverter	
☐	3.3	Measure short circuit current or operating current on every string and compare strings within each combiner	
☐	3.4	Perform insulation resistance testing on DC circuits and record the results	
☐	3.5	Verify fuse and breaker ratings in every combiner match the design and the module specification	
☐	3.6	Confirm all DC connectors are of matched manufacturer and type, with no mixed-brand mating	
☐	3.7	Confirm module-level electronics, where used, are all reporting and mapped to physical positions	
☐	3.8	Confirm DC disconnect labeling, arc-fault and rapid shutdown provisions are installed and functional	
☐	3.9	Perform a thermal scan of combiner boxes under load once the system is producing	

4 AC Electrical and Interconnection

The AC side has fewer connections but larger consequences, and it is where the utility's requirements become binding. Coordinate this section with the utility's witness requirements before scheduling, because a failed witness test restarts a queue measured in weeks.

			NOTES / OWNER / DUE
☐	4.1	Verify phase rotation and phase-to-phase and phase-to-neutral voltages at the point of interconnection	
☐	4.2	Confirm torque values on all AC terminations against manufacturer specification and record them	
☐	4.3	Verify overcurrent protective device ratings and any required coordination study settings	
☐	4.4	Confirm transformer taps are set for the measured site voltage	

4 AC Electrical and Interconnection

			NOTES / OWNER / DUE
☐	4.5	Verify metering current transformer ratios, polarity and wiring against the meter configuration	
☐	4.6	Verify protective relay settings match the approved interconnection study, where a relay is required	
☐	4.7	Verify all placards, one-line diagrams and warning labels required by code and by the utility are installed	
☐	4.8	Confirm anti-islanding and grid-support function settings loaded in each inverter match the approved profile	

5 Grounding and Bonding

Grounding gets verified once and then rarely again, so commissioning is effectively its only real inspection. Continuity failures here do not affect production, which is exactly why they persist for years unnoticed.

			NOTES / OWNER / DUE
☐	5.1	Verify equipment grounding conductor continuity from array to the main bonding point	
☐	5.2	Confirm bonding of all racking sections, including across splices and expansion joints	
☐	5.3	Measure grounding electrode resistance where a ground ring or rods are specified	
☐	5.4	Verify grounding hardware is listed for the materials being bonded and shows no galvanic mismatch	
☐	5.5	Confirm bonding of inverter enclosures, combiner boxes, transformers and fence, where applicable	

6 Monitoring, Communications and Controls

A monitoring system that is not verified at commissioning will be discovered to be wrong months later, usually during the first production dispute. Verify the data, not just that data exists.

			NOTES / OWNER / DUE
☐	6.1	Confirm the data acquisition system communicates and reports at the required interval	
☐	6.2	Verify monitoring energy readings reconcile with the revenue meter over a test period	
☐	6.3	Confirm every inverter, combiner and string channel is named to match the as-built string map	
☐	6.4	Verify irradiance sensors are installed in the plane of array, are level and are reporting plausible values	
☐	6.5	Confirm alarm configuration, notification recipients and escalation paths are set for the operating team	
☐	6.6	Verify remote access credentials are transferred to the owner and contractor-only accounts are removed	
☐	6.7	Confirm any utility or offtaker data feed is delivering to the correct endpoint	

7 Energization and Initial Verification

NOTES / OWNER / DUE

Energization is a sequence, not a switch. Run it deliberately, with a written order of operations, and verify each step before proceeding. Let the system run long enough to capture clear-sky conditions before anyone signs a turnover.

☐	7.1	Hold a pre-energization briefing covering sequence, roles, personal protective equipment and stop authority	
☐	7.2	Confirm the utility has granted written permission to operate before closing the interconnection	
☐	7.3	Energize AC first and verify voltage at each inverter before any DC is applied	
☐	7.4	Bring inverters online one at a time and record startup behavior and any fault codes	
☐	7.5	Verify each inverter reaches expected output and none is derating or clipping unexpectedly	
☐	7.6	Compare per-inverter and per-string output against neighbors on a clear day and investigate outliers	
☐	7.7	Perform a capacity or performance test under the method named in the construction contract	
☐	7.8	Verify rapid shutdown initiation and confirm the system responds as designed	
☐	7.9	Record a baseline production dataset with matching irradiance for future performance comparison	
☐	7.10	Walk the site once more after several days of operation to check for thermal or mechanical changes under load	

8 Turnover Package

NOTES / OWNER / DUE

The turnover package is the durable output of commissioning. Treat it as a deliverable with acceptance criteria, and make final payment contingent on it.

☐	8.1	Final as-built drawings, one-line diagram and string map in an editable and a signed format	
☐	8.2	All test records, including string readings, torque values, insulation resistance and thermal images	
☐	8.3	Inverter configuration files and the approved grid-settings profile	
☐	8.4	Monitoring system administrator credentials and configuration export	
☐	8.5	Permits, inspection sign-offs and the permission to operate letter	
☐	8.6	Spare parts delivered on site, with quantities reconciled against the contract	

+ Additional Commissioning Items	NOTES / OWNER / DUE
Items found that are not covered above.	
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SIGN-OFF

COMMISSIONING LEAD

SIGNATURE AND DATE

OWNER'S REPRESENTATIVE

SIGNATURE AND DATE

This checklist is a structure for making sure nothing obvious is missed. It does not replace the judgment of qualified professionals, the governing documents or the advice of counsel, engineers and other advisors.