NRG Residential Solar Solutions, LLC
1000 North Post Oak, Suite 240
Houston, TX 77055

NRG PV System Installation and Commissioning Checklist

****Note to Build Partners:** After testing is complete, the system may not be turned back on until after receiving an NTC email from NRG and PTO authorization from the administering utility.

****Note to Build Partners:** Clear photos are required during the installation process. Please see page 4 for more information.

Complete all fields, attach additional sheets where needed. The NRG PV System Installation and Commissioning Checklist can be downloaded as a single form from the NRG portal. This form can be completed by hand and scanned or completed using Adobe Acrobat.

Homeowner:		Build Partner:	
Address:		Lease ID:	
		Field Reviewer:	
		Date:	

Contact Us

NRG Residential Solar Solutions, LLC
Phone: 510-370-3000
Email: RSSEngineering@nrgenergy.com

INSTALLATION NOTES

Note all variations from original design plans, and submit in the form of As-Built Plans:

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STRING TESTING

For string inverter systems, please complete the table(s) below. Refer to the *String and Inverter Testing Instructions* in the *NRG RSS Engineering Reference Guide* for complete instructions. If more than two string inverters are installed, attach additional string inverter tables, as needed. **This page does not need to be completed for microinverter (Enphase) systems.**

String Inverter 1:

Label each string:					
Individual String Test Values	V_{OC}				
Inverter Input*	V_{MP}				
	I_{MP}				
Inverter Input MPPT 2 (if used)*	V_{MP}				
	I_{MP}				
Output Power*	Watts (AC)				

String Inverter 2:

Label each string:					
Individual String Test Values	V_{OC}				
Inverter Input*	V_{MP}				
	I_{MP}				
Inverter Input MPPT 2 (if used)*	V_{MP}				
	I_{MP}				
Output Power*	Watts (AC)				

*As displayed or reported by the inverter. Some output parameters may not be available on some inverters. Only single measurements are required for initial verification of system performance and/or troubleshooting.

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SYSTEM PRODUCTION TESTING AND MONITORING VERIFICATION

Date (MM:DD:YY)	
Total PV System Size (kW DC STC rating) =	kW
Locus monitor MAC ID	
Locus monitor Serial number	

While the system is operating at a steady state, measure and record the AC power from the inverter every 5 minutes. Refer to the *System Production Testing and Monitor Verification* section in the *NRG RSS Engineering Reference Guide* for complete Locus monitor testing instructions.

Total System	T_0	T_5	T_{10}
Time (HH:MM)			
Measured PV System Output Power (kW) or Envoy Reported System Output Power (kW)**			
Locus Reported System Output Power (kW)			

Note: If the Locus L-Gate 120 is used, photos of the LCD screen are required for each 5 minute interval (see Photographic Evidence).

Note: If the system is Enphase or SolarEdge, additional photos are required (see Photographic Evidence).

****Enphase Systems only:**

☐ The system is activated in Enphase Enlighten (http://enlighten.enphaseenergy.com) and the email address under "Owner Information" is monitors@nrgsunlease.com.
For complete Enphase System Activation Instructions, please see the *Enphase Envoy Activation* section in the *NRG RSS Engineering Reference Guide.*

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PHOTOGRAPHIC EVIDENCE

Please provide ALL of the following photographs and submit as a single PDF, one photo per page. Clear and well zoomed photos of the system components allow for a quicker review. Provide multiple photos for each requirement if needed. Please check each box if photo(s) for the requirement has been provided.

☐ All installed arrays – verify that array is installed per Approved Design Plans, include photos for each sub-array
- Photos of each array to show that the correct number of modules are installed per Approved Design Plans
- Module placement should match Approved Design Plans, any variations will require as-built plans
- Photo showing all of the arrays from the street or ground-level
- Evidence of tree trimming, shade obstruction removal (vents, satellite dishes, etc.), if applicable, and existing shading conditions as per preliminary shading analysis from Site Survey
- Include any required fire setbacks

☐ Clamps to racking – show type of clamps and bolts
- Evidence of proper use of mid-clamps and end-clamps, clamp is on the frame of the module
- T-bolts are properly installed, if used
- Attachment to rail or racking hardware is secure

☐ Attachment to roof structure – close-up of full mounting system (including flashing) attached to roof and rail
- Photo of sealant applied to flashing prior to attachment
- Proper installation of attachment hardware, use of flashing is correct for the roof type (deck level flashing on tile roofs, flashing is under shingles, or cut out tile)
- Show how tile hooks are attached to the paper under the tile

☐ Area under array from attic, if accessible
- Evidence of upgraded roof structure, if applicable
- Evidence of roof damage, if applicable

☐ Inter-module wires – show that wires are secure and neat
- A photo under the array to show that wires are not hanging down or touching the roof surface
- All wires should be secured with rail clips or zip-ties (no wires should be wrapped around the rails)
- Photos of interconnected module strings labeled and identified

☐ Module grounding
- WEEB lugs are used or proper module ground lugs

☐ Array equipment grounding
- Show equipment grounding conductor (EGC) attached to all metal components of the array, rail, wiring boxes, conduit grounding bushings
- Show stainless steel grounding hardware

☐ Grounding Electrode Conductor (GEC)
- Show evidence of continuous (irreversibly spliced) GEC from the inverter to the grounding system bonding location at the point of interconnection or the grounding electrode

☐ Mounting of junction or combiner box – show at least 1” around box
- Evidence that the combiner box or junction box is supported and properly installed
- Conduit is installed in the correct punchouts of the combiner/junction box

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- Conduit penetrations are water-tight, sealed, and flashed
- Outdoor/waterproof rated splice equipment and box/conduit fittings
- Evidence that the location matches as-built plans, when located beneath the array

☐ Wiring inside junction or combiner box
- Show fuse ratings
- Show junction or combiner box label
- Does the junction box or combiner box have proper safety signage?
    - Ensure labels show appropriate warning and safety messages
- Evidence that box fill is not exceeded
- Conductors securely fastened in termination blocks, and labeled by string
- Outdoor-rated wire nuts and sealant are used
- Show strain relief connectors, LBs, and wire bushings
- Proper color conductors used for grounding
- Irreversible splice/crimp of all grounding conductors

☐ Inverter(s) – show 10' area around (or attachment to rails for microinverters)
- Evidence to show where the inverter(s) are installed, does it match the design plan location
- Proper working clearance and accessibility around the inverter(s)
- Inverter(s) installed in a permanently shaded location
- Do the inverter(s) have proper safety signage?
    - Ensure labels show appropriate warning and safety messages
    - Ensure Imp, Vmp, Isc, max system voltage are labeled per NEC 690.53
- Ensure the NRG sticker with contact telephone # is visible on the inverter or elsewhere, if feasible
- Microinverters installed in an appropriate way (not exposed to sun, attached to the rails under modules)

☐ Enphase systems only
- Photo of Envoy LCD screen showing the number of microinverters online and AC Power

☐ SolarEdge systems only
- Photos of SolarEdge inverter LCD showing voltage (Vmp) and power (Pac) values, and number of optimizers online

☐ Grounding at inverter
- Photos of array EGC and system GEC/EGC, with correct color conductors
- Photos of irreversible splices where required, and grounding bushings on all conduit

☐ DC Disconnect
- With cover open, showing color-coded wiring, grounding (include bushings), fuse ratings
- DC disconnect is properly sized per design plans
- Location of DC disconnect matches design plans
- Does the DC disconnect have proper safety signage?
    - Ensure labels show appropriate warning and safety messages

☐ AC Disconnect
- With cover open, showing color-coded wiring, grounding (include bushings), fuse ratings
- Photo of label indicating ratings, including NEMA ratings for conditions of use
- AC disconnect is installed in the location per design plans
- Fuses in AC disconnect are properly sized

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- Does the AC disconnect have proper safety signage?
    - Ensure labels show appropriate warning and safety messages

☐ PV Load Center
- With dead front removed, showing color-coded wiring, grounding (include bushings), fuse ratings
- PV load center matches information shown in design plans
- Breakers in PV load center are properly sized and includes Locus monitoring per design plans
- Location of PV load center matches design plans
- Does the PV Load Center have proper safety signage?
    - Ensure labels show appropriate warning and safety messages

☐ Locus L-Gate 101 monitor only
- A clear photo of the MAC ID and serial number, either inside the L-Gate or on the side of the box
- Ethernet cable is installed in the correct port inside the L-Gate
- Plug links are not used
- Green light that indicates internet connection is active
- Two conduits, one entering, one leaving

☐ Locus L-Gate 120 monitor only
- A clear photo of the MAC ID and serial number (on the front of the L-Gate)
- Wires are running line side to load side
- If communication cabling is used, evidence showing segregation from power wiring
- If communication cabling is not used, cabling should be properly stowed inside the monitor
- Phone icon indicating that data is being uploaded
- Three photos of the LCD display showing instantaneous kW power - taken at the same consecutive 5 minute intervals as the System Production Testing and Monitoring Verification table (see *Locus L-Gate 120 Installation and Testing Instructions* in the *NRG RSS Engineering Reference Guide*)
- Photos of the LCD display showing the Voltage, Amperage, and Energy kWh values (can be same photos with instantaneous kW power photos from above)

☐ Point of interconnection – close-up of solar breaker or tap blocks
- Point of interconnection matches design plans, breaker is correctly sized
- Tap is correctly installed (load or line-side)
- PV breaker is labeled and Locus CT is visible
- Include photos of ground wire connections
- Include photos of upgraded main service panel, if applicable (bus rating and main breaker rating)

☐ Homerun conduit – show conduit run from array to point of interconnection
- Evidence that the conduit run in internal or external
- Does the conduit have proper safety signage?
    - Ensure labels show appropriate warning and safety messages every ten feet

☐ Additional photos
- Nearby trees, existing roof damage, weather conditions, etc.