

**Technical Services Agreement No. TSA 15-758**

**The National Renewable Energy Laboratory** (hereinafter "NREL")  
 Operating under Prime Contract No. DE-AC36-08GO28308 for the Department of Energy  
 and **Florida Power and Light** (hereinafter "Sponsor")

**I. Parties to the Technical Services Agreement.**

The Alliance for Sustainable Energy, LLC as Management and Operating (M&O) Contractor for the National Renewable Energy Laboratory ("Contractor"), under U.S. Department of Energy Contract No. DE-AC36-08GO28308, has been requested by the "Sponsor" to perform the services set forth in the Scope of Work below.

<b>Sponsor</b>	Florida Power and Light	<b>Contact name</b>	James Hurtt
<b>Address</b>	700 Universe Blvd	<b>Phone #</b>	561-691-2538
	Juno Beach, FL 33408	<b>Fax #</b>	
		<b>Email</b>	James.Hurtt@fpl.com

<b>NREL</b>	National Renewable Energy Laboratory	<b>Contact name</b>	Sudipta Chakraborty
<b>Address</b>	15013 Denver West Parkway	<b>Phone #</b>	303-384-7093
	Golden, CO 80401	<b>Fax #</b>	
		<b>Email</b>	Sudipta.Chakraborty@nrel.gov

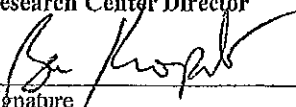
**II. Scope of Work.**

Pursuant to the Technical Services Agreement and subject to the attached terms and conditions, NREL will assign a duly authorized employee to perform the work agreed to as follows:

<b>(a) Title:</b> Description of work: See Appendix A	
<b>(b) Deliverables:</b> See Appendix A	
<b>(c) Period of Performance:</b> 11 Months (not to exceed 36 months)	<b>(e) NREL Cost Estimate</b> \$ 121,359.00 <b>DOE Administrative Charge (3%)</b> \$ 3,641.00
<b>(d) Cost basis:</b> Labor hours and materials	<b>(f) TOTAL Cost Estimate</b> \$ 125,000.00 (not to exceed \$250,000)

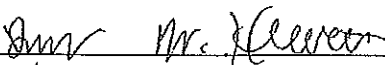
**III. Acceptance of Technical Services Agreement.**

Research Center Director

  
 \_\_\_\_\_  
 Signature Date


Ben Kroposki

Sponsor Acceptance

 9/11/15  
 \_\_\_\_\_  
 Signature Date

Title: Senior Engineer

Contractor Acceptance

 9-14-15  
 \_\_\_\_\_  
 Signature Date

William Farris

Associate Laboratory Director, Innovation Partnering & Outreach

CC: Contracting Officer, DOE Golden Field Office

## Terms and Conditions for Technical Services Agreement

**ARTICLE I. Scope of Technical Services.** Subject to the following terms and conditions, NREL (herein also as "Contractor") agrees to provide Technical Services to the Sponsor in the defined work areas identified in the Scope of Work attached and incorporated herein. It is understood by the Parties that, except for the intellectual property provisions of this Agreement, NREL is obligated to comply with the terms and conditions of the Department of Energy (DOE) M&O Contract when providing goods, services, products, processes, materials, or information to the Sponsor under this Agreement. The parties understand that DOE has authorized NREL to use this Technical Services Agreement when appropriate, and that the total cost to Sponsor will not exceed \$250,000.

**ARTICLE II. Term and Termination of Agreement.** NREL's estimated period of performance for completion of the Scope of Work is the term of this Agreement. The term shall be effective as the later date of (1) the date on which this Agreement is signed by the last of the Parties thereto, or (2) the date on which NREL receives advance payment from the Sponsor. This Agreement may be terminated, in whole or in any part, at any time by either Party, without liability, upon giving ten (10) days written notice to the other party. In the event of termination, the Sponsor shall be responsible for NREL's costs (including closeout costs) through the effective date of termination, but in no event shall the Sponsor's cost responsibility exceed the total cost to the Sponsor as described in the Scope of Work.

**ARTICLE III. Costs.** NREL has no obligation to continue or complete performance of the work at a cost in excess of its estimated cost. NREL agrees to provide at least thirty (30) days written notice to the Sponsor if the actual cost to complete performance will exceed NREL's estimated cost.

**ARTICLE IV. Funding and Payment.** This Technical Services Agreement is based on full cost recovery, and NREL is required by the Government to receive advance funding before beginning work. For this Technical Services Agreement, Sponsor is required to provide 90 days advance funding for costs to be incurred in the performance of this Agreement and NREL shall have no obligation to perform work in the absence of advance funds. Upon termination or completion, any excess funds shall be refunded by NREL to the Sponsor. Sponsor shall enter this Agreement number on the check and mail payment to the following address:

National Renewable Energy Laboratory, 15013 Denver West Parkway, Golden, CO 80401  
ATTN: Finance – Mailstop RSF041

**ARTICLE V. Source of Funds.** The Sponsor hereby warrants and represents that, if the funding it brings to this Technical Services Agreement has been secured through other agreements, such other agreements do not have any terms and conditions (including intellectual property) that conflict with the terms and conditions of this Technical Services Agreement.

**ARTICLE VI. Prepublication Review.** The Parties agree to secure prepublication approval from each other, which shall not be unreasonably withheld or denied beyond thirty (30) days.

**ARTICLE VII. Legal Notice.** Any technical paper, article publication, or announcement of advances generated in connection with work done under this Technical Services Agreement, during the period of performance of the Agreement or in the future, shall give credit to the Sponsor as a sponsor of the work and shall contain the following legal notice: "The National Renewable Energy Laboratory, 15013 Denver West Parkway, Golden, CO 80401 is a national laboratory of the U.S. Department of Energy managed by the Alliance for Sustainable Energy, LLC for the U.S. Department of Energy under Contract Number DE-AC36-08GO28308."

**ARTICLE VIII. Disclaimer.** THE GOVERNMENT AND CONTRACTOR MAKE NO EXPRESS OR IMPLIED WARRANTY AS TO THE CONDITION OF THE TECHNICAL SERVICES; OR ANY INTELLECTUAL PROPERTY; OR PRODUCT MADE OR DEVELOPED UNDER THIS TECHNICAL SERVICES AGREEMENT; OR THE OWNERSHIP, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE OF THE TECHNICAL SERVICES OR RESULTING PRODUCT. THE GOVERNMENT OR CONTRACTOR WILL NOT BE LIABLE FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES.

**ARTICLE IX. General Indemnity.** The Sponsor agrees to indemnify and hold harmless the Government, the Contractor, and persons acting on their behalf from all liability, including costs and expenses incurred, to any person, including the Sponsor, for injury to or death of persons or other living things or injury to or destruction of property arising out of the performance of the Agreement by the Government, the Contractor, or persons acting on their behalf, or arising out of the use of the services

performed, materials supplied, or information given hereunder by any person including the Sponsor, and not directly resulting from the fault or negligence of the Government, the Contractor, or persons acting on their behalf.

**ARTICLE X. Product Liability Indemnity.** Except for any liability resulting from any negligent acts or omissions of the Government or the Contractor, the Sponsor agrees to indemnify the Government and the Contractor for all damages, costs, and expenses, including attorney's fees, arising from personal injury or property damage occurring as a result of the making, using, or selling of a product, process, or service by or on behalf of the Sponsor, its assignees, or licensees, which was derived from the work performed under this Technical Services Agreement. In respect to this Article, neither the Government nor the Contractor shall be considered assignees or licensees of the Sponsor, as a result of reserved Government and Contractor rights. The indemnity set forth in this paragraph shall apply only if the Sponsor shall have been informed as soon and as completely as practical by the Government and/or the Contractor of the action alleging such claim and shall have been given an opportunity, to the maximum extent afforded by applicable laws, rules, or regulations, to participate in and control its defense, and the Government and/or Contractor shall have provided all reasonably available information and reasonable assistance requested by the Sponsor. No settlement for which the Sponsor would be responsible shall be made without the Sponsor's consent unless required by final decree of a court of competent jurisdiction.

**ARTICLE XI. Notice and Assistance Regarding Patent and Copyright Infringement.** The Sponsor shall report to DOE and NREL, promptly and in reasonable written detail, each claim of patent or copyright infringement based on the performance of this Technical Services Agreement of which the Sponsor has knowledge. The Sponsor shall furnish to DOE and NREL, when requested by DOE or NREL, all evidence and information in the possession of the Sponsor pertaining to such claim.

**ARTICLE XII. Patent Rights—Use of Facilities.**

The terms and conditions of this TSA are not intended to be used for research and development, software development, or where there is a possibility of any intellectual property being conceived or created.

**ARTICLE XIII. Rights in Technical Data—Use of Facilities.** Subject to the provisions of this article, Sponsor shall have the right to use, release to others, reproduce, distribute, or publish any data first produced under this TSA. Data produced under this TSA will be provided to the Sponsor who will be solely responsible for marking the data and removing the data from the facility by or before termination of this TSA. DOE and Contractor shall have the right to publish and use any data provided to or generated by Contractor, and to permit others to do so unless such data is marked as "Proprietary Information" by the Sponsor. The Government and Contractor agree not to disclose properly marked Proprietary Information to anyone other than the Sponsor without written approval of the Sponsor, except to Government employees who are subject to the statutory provisions against disclosure of confidential information set forth in the Trade Secrets Act (18 USC 1905). The Government shall have unlimited rights in technical data (including Proprietary Information) that are not removed from the facility by or before termination of this TSA. In addition, the Government and Contractor shall have the unlimited right to perform similar or identical services for other Sponsors as long as the Sponsor's Proprietary Information is not utilized. Sponsor agrees to deliver to persons acting on behalf of DOE a non-proprietary description of the work to be performed under this TSA.

**ARTICLE XIV. Assignment.** Neither this Technical Services Agreement nor any interest therein or claim thereunder shall be assigned or transferred by either Party, except as authorized in writing by the other Party to this Technical Services Agreement, provided, NREL may transfer it to DOE, or its designee, with notice of such transfer to the Sponsor, and NREL shall have no further responsibilities except for the confidentiality, use, and/or nondisclosure obligations of this Technical Services Agreement. The obligation of NREL shall apply to any successor in interests continuing the management and operation of the DOE facility involved in this Technical Services Agreement.

**ARTICLE XV. Similar or Identical Services.** The Government and/or NREL shall have the right to perform similar or identical services in the Statement of Work for other Sponsors as long as the Sponsor's Proprietary Information is not utilized.

**ARTICLE XVI. Non Competition.** The Sponsor states that, to the best of the Sponsor's knowledge, NREL is not in competition with the domestic private sector by performing these Technical Services.

**ARTICLE XVII. Export Control.** Each Party is responsible for its own compliance with laws and regulations.

**ARTICLE XVIII. Entire Agreement.** It is expressly understood and agreed that this Technical Services Agreement and its attachments contain the entire Agreement between the parties. Any agreement to materially change any of the terms and conditions of this Technical Services Agreement or the attachments shall be valid only if the changes are made in writing and executed by the Parties herein.

## TSA-15-758

### Appendix A

# Scope of Work for Engineering and Testing Services From the National Renewable Energy Laboratory in Support of the Florida Power and Light Inverter Evaluation Project

#### Background:

Florida Power & Light (FPL) is designing and constructing a 1.6 MW-DC solar project at the Daytona Motor Speedway in Daytona Beach, FL. This site, once completed, will provide solar canopy shading over a large number of parking spaces at the speedway, while also generating clean solar electricity for interconnection with the FPL distribution network. In addition to these two functions, the project will also provide a test platform for a variety of solar inverter types. FPL will evaluate 9 different inverter manufacturers and models at this location. A total of 44 inverters will be grid connected. The testing and results that FPL wants to achieve are efficiency, short and long term production comparisons, smart inverter features, and inverter reliability. FPL is seeking the support of the National Renewable Energy Laboratory (NREL) to provide support to the design of the site, and test sample smart inverter functionalities for some of these inverters.

#### Timeline:

October 15, 2015 – July 31, 2016.

#### Proposed Budget:

Tasks	Description	Timeline	Cost
Task 1	System Design Support	October 15, 2015 – December 31, 2015	\$ 10,000
Task 2	Smart Inverter Testing at NREL	March 1, 2016 – July 31, 2016	\$ 115,000
Total			\$ 125,000

#### Scope of Work:

##### Task 1: System Design Support

During the design phase of the project, NREL will provide a review of the site construction drawings and make recommendations on the layout of the solar arrays and AC power distribution feeds, such that a suitable test platform is built. Suitable areas for measurement points and/or installing test hardware will be identified.

##### Task 2: Smart Inverter Testing at NREL

After commissioning at FPL, 4 inverters will be disconnected, packaged, and shipped to NREL for testing. The inverter testing shall be agreed to by FPL and NREL, but will include voltage ride-through (VRT), frequency ride-through (FRT), anti-islanding verification with advanced grid support functions, and Q/pf regulation. Other tests such as volt-VAR, frequency-Watt, fault current, load rejection overvoltage (LRO) and efficiency testing may also be conducted and therefore are budgeted below. In order to minimize site downtime, the entire testing period from shipping of inverters to their return shall not exceed 12 weeks. The

testing will only be done for CA rule 21 settings for the advanced grid support functions. The UL1741 revised test plan for CA Rule 21 will be used for the testing where available. The intention of the testing will be to verify various advanced functions through some limited number of iterations as shown in the Table below. The tests will not be intended for certification of these inverters. Therefore complete tests for Rule 21 certification are out of scope for this task. It is assumed that one inverter will be tested at a time. The number of days of testing for each of the above mentioned functionalities will closely follow the estimates provided by NREL on 8/5/2015. At the end of testing, NREL will provide a test report to FPL.

Appendix B

**LOANED SPONSOR'S PROPERTY (In to NREL)**

**Tangible Personal Property**

Date: September 2, 2015

**Title of Agreement:** Florida Power and Light Inverter Evaluation Project

**Number of Agreement:** TSA-15-758

The Sponsor, Florida Power and Light has identified and the Contractor, National Renewable Energy Laboratory (NREL), understands that the following Tangible Personal Property is being loaned to the Contractor by the Sponsor under this Agreement and shall be transported to and located at Contractor's premises:

<b>Detailed Property Description</b>	<b>Serial and/or Part Numbers</b>	<b>Value</b>
SMA Solar Inverter	Tripower 24000TL-US	\$4,125
Sungrow Solar Inverter	SG36KU	\$3,750
Chint Power Solar Inverter	CPS 36kW	\$3,900
Huawei Solar Inverter	SUN200-30KTL-US	\$2,800

1. Title to the loaned property will remain vested with the Sponsor and the Contractor agrees to use the loaned property for the sole purpose of furtherance of the work under this Agreement.
2. The Contractor agrees to account for, control, and maintain the loaned property during the term of this Agreement in the same manner as U.S. Department of Energy property.
3. The Sponsor assumes the risk of loss during transportation of the loaned property to and from the Contractor's premises. Unless otherwise agreed in writing by the Parties, the Sponsor assumes all costs involved in preparation, handling, loading, connecting and disconnecting, and transportation of the loaned property to and from the Contractor's premises.
4. The Sponsor agrees to indemnify and hold harmless the Contractor (NREL) and the U.S. Department of Energy against any and all liability, loss, damages, claims, and costs incidental to the Contractor's use or possession of the loaned property.
5. The loaned property shall be disposed of as the Sponsor directs within thirty days of the date of completion or termination of the Agreement, or a subsequent date as mutually agreed in writing by both Parties.
6. In the event that the Contractor is directed to return the loaned property, the Sponsor shall specify in writing the destination for the return of the loaned property.