Project Annex

To
IMPLEMENTING ARRANGEMENT
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND
THE MINISTRY OF KNOWLEDGE ECONOMY OF THE REPUBLIC OF KOREA
FOR COOPERATION
IN THE AREA OF CLEAN ENERGY RESEARCH AND TECHNOLOGY

CONCERNING DISTRIBUTED ENERGY RESOURCE TECHNOLOGY INTEROPERABILITY

The Department of Energy of the United States of America and the Ministry of Trade, Industry and Energy of the Republic of Korea (formerly the Ministry of Knowledge Economy), hereinafter the "Parties":

DESIRING to collaborate on the development of test bed facilities to support distributed energy resource (DER) interoperability testing and building a certification system; and

ACTING pursuant to section 4 of the Implementing Arrangement between the Department of Energy of the United States of America and the Ministry of Knowledge Economy of the Republic of Korea for Cooperation in the Area of Clean Energy Research and Technology, signed October 11, 2011 (the Implementing Arrangement),

Have agreed as follows:

1. Technical Scope of Work

a. The goal of the activities to be performed under this Project Annex is to perform joint research to support the development of test procedures and standards for interoperability of distributed energy systems and related instrumentation.

b. The activities to be carried out include joint research and information exchanges at DER testbed facilities in the United States and the Republic of Korea, preparation of test procedures, interoperability testing, and comparison of test results. The test results will be used to support development of a mutual certification system for interoperability testing.

c. Additional information on the scope of work and schedule is provided in Appendix 1 attached to this Project Annex.

d. All activities carried out under this Project Annex are subject to the provisions of the Implementing Arrangement, which is itself subject to and governed by the Agreement on Science and Technology Cooperation between the Government of the United States of America and the Government of the Republic of Korea signed July 2, 1999, as extended (the S&T Agreement). In the event of any conflict between the provisions of this Project Annex on the one hand, and the S&T Agreement and the Implementing Arrangement on the other hand, the provisions of the latter will govern.

2. Participating Organizations

The activities under this Project Annex will be performed by the following organizations:

a. For the Department of Energy (DOE): Sandia National Laboratories (SNL)

b. For the Ministry of Trade, Industry and Energy (MOTIE): Korea Electrotechnology Research Institute (KERI) and Korea Institute of Energy Technology Evaluation and Planning (KETEP) Acting on behalf of MOTIE, KETEP will fund, manage, and evaluate the research undertaken by the Korean participants.

3. Implementation

a. Key Personnel

The principal investigators and other key points of contact are identified in Appendix 2 attached to this Project Annex.

b. Program Management and Communications

SNL and KERI will be responsible for planning and executing technical work to be performed under this Project Annex. SNL and KERI will communicate directly with each other, unless otherwise directed by DOE and MOTIE through KETEP, respectively. SNL and KERI will prepare work plans with projected milestones for each phase of the joint project, and report on progress as requested by DOE and MOTIE through KETEP. SNL and KERI will review Appendix 1 and 2 annually and update them as necessary. SNL and KERI will report on progress during the annual DOE-MOTIE Bilateral Clean Energy Policy Consultation, in accordance with Section 4.4 of the Implementing Arrangement.

c. Funding

All costs associated with the implementation of activities under this Project Annex willl be the responsibility of the entity that incurs them. The implementation of activities under this Project Annex will be subject to the availability of funds. Projected levels of funding from DOE and MOTIE through KETEP for this Project Annex are shown in Appendix 2.

4. Period of Performance

a. This Project Annex will be effective from the date of signature for a period of three (3) years. It may be extended by written agreement of the Parties.

b. The period of performance of activities to be carried out under this Project Annex is identified in Appendix 1.

Signed in duplicate.

For the Department of Energy
of the United States of America:

Dan T. Ton
Program Manager
Office of Electricity Delivery
and Energy Reliability

Date: 8-28-2013

Place: Washington

For the Ministry of Trade, Industry and
Energy of the Republic of Korea:

Dae-Hwan Jung
Deputy Director
Energy Technology Division

Date: 9-9-2013

Place: Seoul

Appendix 1
Technical Scope of Work and Schedule

Project Title		Development of Test Bed for DER Interoperability Testing and Building of Certification System			
Period of Performance		FROM: 01-12-2012		TO: 30-11-2015	
		Year 1	Year 2	Year 3	Sum
Project Period		01-12-2012 ~ 30-11-2013	01-12-2013 ~ 30-11-2014	01-12-2014 ~ 30-11-2015	01-12-2012 ~ 30-11-2015
Total Budget (Unit: KRW 1000/US$)	KERI	KRW 373,700,000	KRW 300,000,000	KRW 300,000,000	KRW 973,700,000
		- determination of DG devices under test : PV and ESS - review of the existing test facilities - basic design of test bed and implementation - writing draft of interoperability test procedure	- construction of test bed - performing interoperability test on various DG devices - comparison of test results	- proposal of international standards -building mutual certification system on interoperability test regarding DG devices	
	SNL	**200,000 USD** - Design and construct testbed - Establish utility to DER communication - Draft standardized test procedure and data acquisition protocol - Develop standardized analysis procedure and test reporting - Comparing Korean and U.S. results - Test PV inverters: 2 to 4 functions	**200,000 USD** - Amplification of PV inverter tests: 3-10 new inverter functions; residential to commercial scale - Revise interoperability protocol based on prior results - Comparing Korean and U.S. results - Design, construct, exercise testbed for ESS incorporation - Status report on program and results.	**200,000 USD** - Amplification of PV and ESS tests: complete set of inverter functions - Use experimental results to propose a test protocol standard (IEC) - Final report on program and results.	**600,000 USD**

Appendix 2

Key Personnel

Republic of Korea	United States of America
Ministry of Trade, Industry and Energy	Department of Energy
Dae-Hwan Jung Deputy Director Energy Technology Division Ministry of Trade, Industry and Energy hanbitj@motie.go.kr +82-2-2110-5692	Dan T. Ton Program Manager Office of Electricity Delivery & Energy Reliability Smart Grid Research & Development Dan.ton@hq.doe.gov 202-586-4618
Jangjean Kang Director Energy Technology Division Ministry of Trade, Industry and Energy jerrus@motie.go.kr +82-2-2110-5691	Ronald C. Cherry Senior Policy Advisor Office of East Asian Affairs Office of Policy and International Affairs U.S. Department of Energy Ron.cherry@hq.doe.gov (202) 586-2285
Korea Electrotechnology Research Institute	Sandia National Laboratories
Jongbo Ahn Principal Researcher Smart Distribution Research Center	Charlie Hanley Manager, Photovoltaic and Distributed Systems Integration
	Jay Johnson Principal Researcher, Photovoltaic and Distributed Systems Integration