Memorandum of Understanding

between

The Regents of the University of California and

The Greenhouse Gas Inventory and Research Center of Korea

Concerning Cooperation on Energy Sector Planning, Policy Analysis, Energy Modeling, and Research Exchange

This Memorandum of Understanding (MOU) is between The Regents of the University of California, in its capacity as the manager and operator of the Lawrence Berkeley National Laboratory (LBNL), and the Greenhouse Gas Inventory and Research Center of Korea (GIR).

LBNL is a U.S. Department of Energy National Laboratory managed and operated by The Regents of the University of California pursuant to Contract No. DE-AC02-05CH11231. GIR is a research institute responsible for the preparation and submission of the Republic of Korea's national communications to the United Nations Framework Convention on Climate Change, formulation of greenhouse gas (GHG) emissions inventories at the national level, management of national GHG goals, and research advancement on climate change issues internationally, having its registered office at 163 Sinmunno 1-ga, Jongno-gu, Seoul 110-999, Republic of Korea.

For purposes of this MOU, LBNL and GIR are collectively herein referred to as "Participants" or separately as "Participant."

1. Objective

The objective of this MOU is to provide a framework to explore potential future collaboration between the Participants in energy sector planning, policy analysis, energy modeling, and related research exchange (collectively "the Field"). While the Participants already conduct complementary activities in the Field, the proposed collaboration aims to enhance the technical exchanges between LBNL and GIR and to share research experiences and achievements. It is hoped that the proposed collaboration will lead to the development and implementation of joint projects in the Field that would help both Participants accelerate the cultivation of international research exchange, increase research cooperation, and elevate both Participants' influence in the Field worldwide.

2. Areas of Planned Cooperation

- A. The Participants express their intention to promote research and information exchanges and to facilitate future joint research and dissemination activities in the following areas:
 - i. Energy sector assessment for energy efficiency, renewable energy, and green

technology deployment;

- ii. Policy analysis for assessment of energy sector alternatives;
- iii. Energy modeling for GHG emissions abatement; and
- iv. Collection and utilization of empirical data on consumption behavior and technology adoption.

B. The proposed areas of cooperation may include:

- i. Visits and exchanges of researchers and experts, intended to promote understanding, expand areas of collaboration, share information and achievements of research activities, and identify funding opportunities in the Field;
- ii. Joint activities relating to energy efficiency, renewable energy, energy sector modeling, and policy analysis that adapts U.S. energy and environmental impact analysis to international energy- and environment-related activities, and to accelerate training of the inter-disciplinary talent; and
- iii. Discussions regarding future collaborative research projects.
- C. The scope of above activities and cooperation may be changed or extended to other areas by written consent of the Participants.

3. Commencement, Modification and Discontinuation

- A. Cooperative activities under this MOU may commence upon signature and continue for a five (5) year period, unless discontinued in accordance with paragraph B of this Section 3.
- B. The Participants may discontinue this MOU at any time in writing. A Participant that wishes to discontinue its participation in this MOU should endeavor to provide at least thirty (30) days written notice to the other Participant.
- C. This MOU may be modified in writing by mutual consent of the Participants, and may be extended for additional periods.

4. Designated Representatives

- A. To administer the implementation of this MOU, each Participant should designate one principal coordinator in charge of the collaboration, through whom all requests and plans of that Participant are to be made.
- B. The designated representatives may hold meetings when necessary to discuss matters related to cooperation under this MOU.
- C. For purposes of this MOU, the designated representative for LBNL is the Environmental Energy Technologies Division Director, or other LBNL designee. The designated representative for GIR is Mr. Youngmin Kim, Director of Planning and Coordination, or another designee as may be appointed by GIR.

5. General Considerations

- A. This MOU does not create any legally binding obligations.
- B. Each Participant should conduct the activities contemplated by this MOU in accordance with all applicable laws, regulations and other requirements to which it is subject, including, without limitation, export control laws and environment, health and safety laws and regulations.
- C. The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.
- D. Each Participant is to be responsible for the costs it incurs in participating in cooperative activities under this MOU.

THE GREENHOUSE GAS

Inventory and Research Center

Signed in duplicate.

THE REGENTS OF THE UNIVERSITY

OF CALIFORNIA, LAWRENCE INVENTORY AND RESEARCH BERKELEY NATIONAL LABORATORY CENTER OF KOREA By: Name: Dr. A. Paul Alivisatos Name: Mr. Youngmin Kim Planning Title: Director, Lawrence Berkeley Title: Director, and National Laboratory Coordination, Greenhouse Gas

Date Nov. 6 2013 Date Nov. 6. 2013