IMPLEMENTING ARRANGEMENT #1 TO THE AGREEMENT BETWEEN THE AMERICAN INSTITUTE IN TAIWAN AND THE TAIPEI ECONOMIC AND CULTURAL REPRESENTATIVE OFFICE IN THE UNITED STATES FOR TECHNICAL COOPERATION IN CLEAN COAL AND ADVANCED POWER SYSTEMS TECHNOLOGIES

Article I : Purpose

This Implementing Arrangement is entered into by the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office in the United States (TECRO), hereinafter referred to as the "Parties", to implement program activities under the Agreement between AIT and TECRO for Technical Cooperation in Clean Coal and Advanced Power Systems Technologies, signed October 31, 2003 and January 20, 2004 (the "AIT/TECRO Agreement"). AIT, through its designated representative, the United States Department of Energy (DOE), in cooperation with TECRO, through its designated representative, the Ministry of Economic Affairs, Bureau of Energy (formerly Energy Commission) in Taipei (MOEABOE), shall carry out program tasks, determine priorities for future cooperation activities, and develop work programs for such future activities.

Article II: Authorization

The activities described in this Implementing Arrangement shall be carried out subject to the general terms and conditions of the AIT/TECRO Agreement.

Article III: Scope of Work

Program tasks to be carried out under this Implementing Arrangement are outlined in the Attachment - Technical Cooperation Program Description and Budget for 2013 and 2014, which is attached to and constitutes an integral part of this Implementing Arrangement.

Article IV: Responsibilities of AIT

The responsibilities of AIT, through its designated representative, DOE, under this Implementing Arrangement are:

A. To undertake the tasks and manage the funds set forth in the Attachment;
B. To make available personnel, equipment and other assistance as may be necessary to carry out such tasks, subject to the availability of appropriated funds and other resources;
C. To facilitate consultations between and among representatives of TECRO, MOEABOE, DOE and other appropriate agencies; and
D. To report on an annual basis and at the end of the term of this Implementing Arrangement to TECRO, through its designated representative, MOEABOE, on the use of funds received from TECRO pursuant to Article VI.

Article V: Responsibilities of TECRO

The responsibilities of TECRO, through its designated representative, MOEABOE, under this Implementing Arrangement are:

A. To provide all necessary financial reimbursement in accordance with Article V of the AIT/TECRO Agreement and Article VI of this Implementing Arrangement, as well as administrative and other assistance to support AIT in undertaking the tasks set forth in the Attachment;

B. To provide guidance for and to facilitate consultations between and among representatives of AIT, DOE, MOEABOE, and other appropriate agencies; and

C. To ensure that all necessary logistical arrangements for tasks to be conducted on the territory of the authorities represented by TECRO, including the provision of training and conference facilities, are completed prior to the commencement of each such task.

Article VI: Financial Arrangements

A. In accordance with Article V of the AIT/TECRO Agreement and prior to the commencement of activities by AIT's designated representative under this Implementing Arrangement, during each of the fiscal years for which this Implementing Arrangement is in force, TECRO shall advance to AIT the amount of funds (in U.S. dollars) specified in the Attachment to this Implementing Arrangement. These funds shall be used by AIT's designated representative to defray costs that it incurs in carrying out the tasks identified in the Attachment to be undertaken during such fiscal year. Upon receipt of funds from TECRO for each fiscal year, AIT, through its designated representative, shall commence such tasks.

B. Any funds received by AIT from TECRO that remain at the end of the term of this Implementing Arrangement shall be returned to TECRO unless the designated representatives of AIT and TECRO, DOE and MOEABOE, respectively, request that remaining funds be reprogrammed into subsequent Implementing Arrangements.

Article VII: Intellectual Property Considerations

No intellectual property is expected to be created, and no business proprietary information is expected to be exchanged, in conjunction with activities to be undertaken pursuant to this Implementing Arrangement.

Article VIII: Entry into Force, Amendment and Termination

A. This Implementing Arrangement shall enter into force upon signature, and may be amended by written agreement of the Parties at any time.

B. This Implementing Arrangement shall remain in force, so long as the AIT/TECRO Agreement remains in force, for the period covered by the Attachment, unless terminated earlier by either Party upon six months written notice to the other Party and its designated representative. Termination shall not affect the validity or duration of activities not fully completed at the time of termination.

C. Program management and planning activities regarding future proposed Implementing Arrangements may continue before an amendment is finalized.

IN WITNESS WHEREOF, the undersigned, being duly authorized, have signed this Implementing Arrangement.

DONE in duplicate.

Barry J. Schoyer	Leo Lee
Name	Name
Managing Director	Deputy Representative
Title FOR THE AMERICAN INSTITUTE IN TAIWAN	Title FOR THE TAIPEI ECONOMIC AND CULTURAL REPRESENTATIVE OFFICE IN THE UNITED STATES
July 1, 2013	Sept. 18, 2013
Date	Date
Washington, D.C.	Washington, D.C.
Place	Place

ATTACHMENT: Technical Cooperation Program Description and Budget for 2013 and 2014

COLLABORATION ON CARBON GEOLOGIC STORAGE
between
UNITED STATES DEPARTMENT OF ENERGY, NATIONAL ENERGY TECHONOLOGY LABORATORY
and
INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE

BACKGROUND

The Department of Energy, National Energy Technology Laboratory (NETL), and seven Regional Carbon Sequestration Partnerships (RCSPs) are now conducting large scale demonstration of geological storage in the territory of the authorities represented by AIT. Experiences from site characterization by RCSPs are valuable information for ongoing pilot projects on the territory of the authorities represented by TECRO. Monitoring technique is also crucial to ensure the safety of geological storage. Tracers, wellbore integrity, and micro-seismic are possible issues for collaboration.

There are currently two ongoing pilot CO_2 storage projects in Taiwan. CPC Corporation is planning to inject CO_2 into a depleted gas field. Taipower Company is drilling a 3,000m site characterization well for saline aquifer storage. The Bureau of Energy and Industrial Technology Research Institute (ITRI) are developing their capability on numerical simulation and risk assessment of geological storage to support these projects.

Risk management-related topics such as existing reservoir model review, history matching, model comparison, and applicability of risk profile and strategic monitoring protocols developed by National Risk Assessment Partnership (NRAP) could provide guidance and insight for risk management and monitoring strategy for pilot projects on the territory of the authorities represented by TECRO.

OBJECTIVE

The objective of this potential collaboration is to provide educational activities, training, workshops, and site visits related to the technical topics of monitoring, site characterization, and risk assessment for geological storage of carbon dioxide.

SCOPE

This scope of work includes the following:

Monitoring technique – Perfluorocarbons (PFCs) tracers and geophysical techniques

Risk Assessment – Quantitative risk assessment methods and tools

Site Characterization Techniques – Understanding RCSP project planning

Site-Specific Assessments – Geological Model and Reservoir Simulation Tracer Injection and Model Comparison (if available)

ACTIVITY AND FINANCIAL ARRANGEMENTS

Proposed Carbon Geologic Storage (CGS) Collaboration (for 2013)

No.	Area of Interests	Activities	Duration	Location
1	Monitoring	Monitoring Workshop on CO_2 Geological Storage ● Background ● Geophysical Monitoring ● Geochemical Monitoring ● Geomechanical Monitoring ● Surface Monitoring ● Other Monitoring ● Monitoring and Accounting Protocol and Regulation ● Field Experience	3 months prep; 2.5 day course	Pittsburgh, PA
2	Monitoring	PFC Tracer Workshop ● Methodology ● Deployment ● Sampling Procedure ● Analytical Procedure ● Field Experience	3 months prep; 1.5 day course	Pittsburgh, PA
3	Site Characterization	Site Visit to NETL and RCSP Projects ● NETL Office/Laboratory ● Illinois Basin Decatur Project ● SECARB Project	2-3 weeks	Morgantown, Pittsburgh, Decatur, Cranfield
4	Site Characterization	Site Selection and Characterization Best Practice Workshop ● Methodology	3 months prep; 2	Taiwan

		• Subsurface Data Analysis • Model Development • Site Suitability • Scenario Analysis • Site Plan Development • Regulation and Permit • Case Study	day course	
5	Risk Assessment	Risk Assessment - Geological Modeling and Reservoir Simulation Workshop • Methodology • Risk Analysis Methodologies • Risk Source Assessment • Risk Characterization • Risk Management • Numerical Simulation • 1st Generation Risk Profile • Case Study	3 months prep; 3 day course	Taiwan
				2013 Budget: $250,000

Proposed Carbon Geologic Storage (CGS) Collaboration (for 2014)

No.	Area of Interests	Activities	Duration	Location
1	Monitoring	Monitoring Workshop on CO_2 Geological Storage ● RCSP Case Study ● International Case Study ● Strategic Monitoring	3 months prep; 2 day course	Taiwan
2	Monitoring	CO_2 Leak Detection Workshop (including Distributed Optical Sensor) ● Methodology ● Instrument ● Deployment ● Field Experience ● On-site training	3 months prep; 2 day course	Pittsburgh, PA
3	Site Characterization	Site Visit to NETL and RCSP Projects ● TBD	2-3 weeks	USA (TBD)
4	Site Characterization	Experiment for Site Characterization Training Course ● NETL lab site visit ● Petrophysics experiment ● Geomechanical experiment ● Geochemical experiment ● Experimental apparatus design and operation ● Micro-CT image acquisition and processing	3 months prep; 3 day course	Pittsburgh, PA Morgantown, WVA
5	Risk Assessment	Risk Assessment – NRAP and Taiwan Case Study ● Risk Assessment Tools ● Systems Analysis Framework ● NRAP Case Study ● Taiwan Case Study ● History Matching and Model Comparison (if available)	3 months prep; 3 day course	Taiwan
				2014 Budget: $250,000

Notes – In the preparation stages, there may be interactions including a series of teleconferences and webinars to exchange information on each organization's research portfolio, and to provide focused exchange on listed topics. In addition, interactions may include travel to exchange knowledge and visit field sites in the territories of the authorities represented by AIT or TECRO.. NETL and ITRI will pay their own travel expenses.