

Organized Research Unit (ORU) on Carbon Capture and Sequestration: Meeting the Needs of the Energy Sector

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Summary Report - Fall 2009

In this report, we summarize the efforts and outcomes of our activities towards the formation of an Organized Research Unit (ORU) on Carbon Capture and Sequestration (CCS). The purpose of this effort was to transform the \$10K seed funding that was awarded from the VSoE research innovation fund into a broader ranging ORU with focus on addressing the challenges that currently exist and need to be overcome for CO₂ capture and sequestration to become a practical reality.

The ORU originally consisted of researchers from the VSoE and the USC Energy Institute and one of the main objectives of the proposed effort was to expand this collaboration to include faculty from the collage as well as other USC investigators with unique talents in the area. To this end, a portion of the requested fund was used to organize activities to identify and interact with such researchers. In addition to internal meetings with faculty from USC, we participated in a range of external CCS activities (conferences and workshops) as well as in proposals writing towards additional activities at USC in the area of CCS. In the following subsections, we outline the various activities and highlight the main outcomes of the efforts derived from the awarded seed funding.

Our activities can conveniently be organized in the following three main categories:

- a. Internal meetings at USC with faculty from VSoE, the College and the Energy Institute
 - b. Participation in external CCS workshops and conferences
 - c. Outreach and Proposal writing activities towards additional CCS activities at USC
- a) Internal meetings with participation from the Collage (Chemistry and Geology), the Energy Institute and VSoE (MFD, AME and CCE): Two lunch meetings were hosted by the PI's where faculty from across USC with an expressed interest in CCS, energy and environmental aspect of the current energy infrastructure were invited to exchange ideas and to identify potential private and public funding opportunities. At the first meeting, additional potential collaborators were identified and invited for the second meeting. After the second meeting, however, it became clear that a unique opportunity existed for collaboration on geological carbon sequestration among faculty in the Mork Family Department of Chemical Engineering and

Material Science, the Department of Civil and Environmental Engineering and the Energy Institute with the potential of attracting significant external funding for additional CCS research activities at USC. The effort and outcomes of this collaboration is summarized in section c).

b) Participation in external CCS workshops and conferences: To ensure an adequate visibility of USC in the context of CCS, we have participated in a range of workshops and conferences including:

2008 SPE/AICHE joint CO₂ and Energy Workshop, Sonoma, CA.

2009 EPRI CO₂ Storage and Sequestration Workshop, Chicago Illinois.

2009 SPE International Conference on CO₂ Capture, Storage and Utilization, San Diego, CA, with ePoster presentations from 3 USC students from ChE and PTE.

c) Outreach and Proposal writing activities: A series of meetings was organized with help from the Energy Institute to understand the needs of LA based energy companies and to identify potential collaborations between USC and these companies on CCS activities. After additional specific meeting, however, it became clear that the funding opportunities were somewhat limited at this point. A portion of the seed funding was subsequently used to support the meeting and proposal writing activities that eventually lead to the submission of an Energy Frontier Research Center proposal: “Integrated Science of Geological Carbon Sequestration” to BES office at DOE. Participating from USC, Lawrence Berkeley National Laboratory, Colorado School of Mines, Harvard University, Johns Hopkins University, Massachusetts Institute of Technology, Stanford University, California State University – LA. Regrettably, the proposal was not selected for funding. A second proposal was submitted to the Global Climate and Energy Project at Stanford University. The proposal involved a collaborative research effort on geological carbon sequestration in saline aquifers in China. Two Chinese universities (Peking University and China University of Geosciences, Wuhan), CEE and MFD at USC participated in the proposal writing. The proposal was selected for funding and the project was announced in the early fall of 2009. The initiation of this project will attract additional attention to USC in the area of geological carbon sequestration through both public and closed workshops on geological storage. We will continue to work actively to build on this initial success.

In summary, we feel that we have partially achieved the goals the ORU proposal and that the seed funding has been converted into additional activities at USC. However, additional efforts on cross-campus interactions and research collaborations are still both warranted and needed.