

Memorandum of Understanding
between
The Regents of the University of California, as Management and Operating Contractor for
Lawrence Berkeley National Laboratory
and
Research Center for Clean Energy and Power,
Chinese Academy of Sciences

Concerning Collaborations to Advance the Technical, Environmental,
and Cost Performance of Fossil Energy Technologies

This Memorandum of Understanding (MOU) is between The Regents of the University of California (The Regents), in its capacity as manager and operator of Lawrence Berkeley National Laboratory (LBNL), and the Research Center for Clean Energy and Power within the Chinese Academy of Sciences (CAS-CEP).

LBNL is a U.S. Department of Energy (DOE) National Laboratory managed and operated by The Regents pursuant to DOE Contract No. DE-AC02-05CH11231. CAS is the national academy for the natural sciences of the People's Republic of China. CEP is a research center within CAS that performs research and development (R&D) of advanced energy and power transformation technologies and systems.

The Regents and CAS-CEP are collectively herein referred to as "Participants" or individually as a "Participant."

1. Objective

The objective of this MOU is to explore collaborations that will promote and sustain research, development, and demonstration on base and enabling technologies, and assessments of technology options and economics.

2. Proposed Areas of Collaboration

The Participants express their intention to collaborate in one or more of the following areas:

- A. Exploration of possible R&D topics related to gas turbine combustors, including, but not limited to the syngas combustor, hydrogen combustor, low-swirl combustor and MILD combustor.
- B. Discussion of possible experimental research facilities for gas turbine combustor design and development including, but not limited to a full-scale single can combustor facility and a high pressure optical permeability combustor evaluation facility.

The scope of above activities and cooperation may be changed or extended to other areas by mutual written consent of the Participants.

3. Proposed Forms of Collaboration

The Participants expect to collaborate through mutual visits, the exchange of publicly-available information, exchanges of researchers and experts, training, and planning for potential future joint research, with any future collaborative research to be undertaken only pursuant to an appropriate written agreement therefor.

4. Proposed Mechanisms of Collaboration

- A. To administer the implementation of this MOU, each Participant should designate one or more principal coordinators to be in charge of the collaboration, through whom all requests and plans of that Participant should be made.
- B. The principal coordinators may hold meetings when necessary to discuss matters related to collaboration under this MOU.
- C. The principal coordinator for The Regents is Robert Cheng, Scientist. The principal coordinator for CAS-CEP is Zhang Zheduan, Deputy Dean, Research Center for Clean Energy and Power.

5. Commencement, Modification and Discontinuation

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

6. Exchange of Information

The Participants do not anticipate the exchange of business-confidential information or the creation of intellectual property. If the Participants determine that a particular activity may lead to the exchange of business-confidential information or the creation of intellectual property, they should consult with each other and enter into an appropriate written agreement therefor.

7. General Terms

- A. 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 by way of illustration and not by way of limitation, export control laws;

environmental, health and safety laws and regulations; and international agreements to which its Government is party.

- B. This MOU does not create any legally binding obligations between the Participants.
- 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 responsible for the costs it incurs in participating in cooperative activities under this MOU.

Signed in duplicate.

FOR THE REGENTS OF THE
UNIVERSITY OF CALIFORNIA

FOR RESEARCH CENTER FOR
CLEAN ENERGY AND POWER,
CHINESE ACADEMY OF SCIENCES

By: Michael Witherell

By: Xiao Yunhan

Name: Dr. Michael Witherell

Name: Xiao Yunhan

Title: Director, Lawrence Berkeley
National Laboratory

Title: Director General

Date 1-23-2017

Date 3-27-2017

Place Berkeley, CA USA

Place Beijing, CHINA