



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心



U.S.-China Clean Energy Research Center

中美清洁能源研究中心

U.S.: <http://www.us-china-cerc.org>

China: <http://www.cerc.org.cn/>



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

U.S. - China CERC Steering Committee Meeting

Overview by U.S. & China CERC Directors

Dr. Robert C. Marlay

U.S. Director

U.S.-China Clean Energy Research Center

International Affairs

U.S. Department of Energy

Counselor CAI Jianing

China Director

U.S.-China Clean Energy Research Center

International Cooperation

Ministry of Science and Technology

Beijing, Peoples Republic of China

July 11, 2014



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Leadership on Clean Energy Cooperation at the Highest Levels



In November 2009, President Obama and China's former President, Hu Jintao launched:



In February 2013, President Obama met with China's President Xi Jinping in Washington, D.C. U.S.-China Cooperation on clean energy remains a joint priority.

Seven Joint Clean Energy Initiatives (2009)

- Electric Vehicles Initiative
- Energy Efficiency Action Plan
- Renewable Energy Partnership
- 21st Century Coal

- Shale Gas Resource Initiative
- Energy Cooperation Program
- U.S.-China Clean Energy Research Center**



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Supported by a Ministerial Level CERC Protocol

- 🌐 CERC Protocol Signed in Nov. 2009
- 🌐 CERC Goals:
 - Improve Energy Efficiency
 - Spur Innovation of Clean Energy Techs
 - Diversify Sources of Energy Supply
 - Accelerate Transition to Low-Carbon Future
 - Avoid the Worst Consequences of Climate Change
- 🌐 Three Areas for Initial Cooperation:
 - Advanced Coal Technology & CCUS;
 - Clean Vehicles; and
 - Efficient Buildings
- 🌐 Joint Work Plans Signed in Jan. 2011
- 🌐 Open to Other Areas in the Future



Signing of CERC Protocol Nov. 2009

Steven Chu, U.S. Secretary of Energy
Liu Yandong, PRC State Counselor
Gary Locke, U.S. Secretary of Commerce
Wan Gang, PRC Minister of S&T (MOST)



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Innovative Model for Enhanced S&T Collaboration

Cooperation (Traditional)

- Work Plans Coordinated, but Separate
- Independent Work on Similar Projects
- Interactions Characterized by Research Visits, Personnel and Student Exchanges
- R&D Focuses on Institutional Strengths
- Relationships Collegial
- R&D Results Shared Externally
- Benefits are Mainly Academic; Transfer of Knowledge via Technical Papers & Reports
- No guaranteed IP Rights in Other's Territory; IP Provisions Not Flexible
- Few IP Advantages for R&D Partners

Collaboration (CERC) *

- Work Plans Developed Jointly
- Work Together on Same Projects
- Research Characterized by Division of Labor Among Participants on Joint Tasks
- Joint R&D Exploits Complementarities
- Relationships Interdependent
- R&D Results Can Arise Jointly
- Benefits are Embedded among Partners and Extended by Interests in Commercialization
- Guaranteed Right to IP in Other's Territory; IP Terms & Conditions May be Negotiated
- Potentially More Attractive IP Platform



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Jointly Pledged Equal Funding of CERC

- Strongly Supported by MOST and DOE
- Equivalent of \$150 Million Pledged over 5 Years
- Equally Shared by Both Sides With Significant Partner Contributions

Technology Area	U.S.		China	Total Project Funding
	DOE	Partners	MOST & Partners	
CERC-ACTC	\$12.5M	≥ \$12.5M	\$25.0M	\$50.0M
CERC-CVC	\$12.5M	≥ \$12.5M	\$25.0M	\$50.0M
CERC-BEE	\$12.5M	≥ \$12.5M	\$25.0M	\$50.0M
			Planned	\$150.0M



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Jointly Adopted Criteria for CERC Project Selection

- Joint research projects must meet the following criteria:
 - Strong scientific and technical merit
 - High relevance to CERC goals and technical objectives
 - Quality of the research team, including leadership, key personnel, and expertise, and supporting resources, equipment, and facilities
 - Beneficial outcomes for both countries; not one country alone
 - Emphasis of on science, technology and innovation, with potential for IP
 - Evidence of joint U.S./China research collaboration (e.g., foreign partner, joint R&D plan, division of labor, or interdependencies)
 - A clear path to potential commercialization and deployment



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Summary of Research Activities*

CERC Technical Track	Joint Work Plan Research Areas	Number of Research Activities	Number of Joint Research Activities	Present Extent of Joint Work	Goal for Joint Work
Advanced Coal Technology Consortium	9	39	30	77%	100%
Clean Vehicles Consortium	6	24	16	67%	100%
Building Energy Efficiency	5	12	12	100%	100%
Summary	20	75	58	~ 77%	100%



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Researchers Supported by CERC

	US	China	Total
Advanced Coal Technology Consortium	40	200	240
Clean Vehicles Consortium	127	320	447
Building Energy Efficiency	79	320	399
Total	246	840	1086



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

CERC Partners

Technology Area	U.S.		China		Totals
	Lead	Partners	Lead	Partners	
CERC-ACTC	WVU	10	HUST	16	26
CERC-CVC	UM	15	THU	19	34
CERC-BEE	LBNL	15	MOHURD	37	52
Totals		40		72	112



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Jointly Adopted Criteria for CERC Partners

- Partners Are Key to Productive R&D and Tech. Deployment
- New Partners Are Encouraged to Join CERC
- Prospective Partners Shall:
 - Support the Overall Mission and Vision of the CERC Consortium
 - Add Value to CERC Capacities and Work Programs
 - Support Projects Interest that Meet CERC Criteria
 - Agree to Rights & Obligations of Other Partners
 - Agree to Technology Management Plan (TMP) on Intellectual Property
- May Apply to Respective Country's CERC Consortium Director
- As Jointly Agreed, the CERC Consortium Director Shall:
 - Consult with Existing Consortium Members
 - Consult with Other-Country CERC Consortium Director
 - Determine Suitability of Membership and Contributions
 - Inform CERC Secretariat of a New Partner



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Innovative Framework for Protecting Intellectual Property

- Innovative Bi-Lateral Approach to IP Enabled by CERC Protocol & IP Annex
- Jointly Developed Technology Management Plans (TMPs)
 - Strengthen IP Protections
 - Encourage Sharing of Ideas
 - Enable a Robust Research Agenda
 - Support Fair Resolution of Disputes
 - Endorsed by Both Governments
- Successful IP Conference, Hainan, March 2012
- Follow-Up Conference – Palo Alto, Feb 2013
- Ambitious Work Plan for 2014-2015



Two governments sign endorsement letters supporting the jointly agreed upon & signed Technology Management Plans *

Observers:

Secretary of Energy Steven Chu
Minister of Science & Technology WAN Gang
Vice Minister QIU Baoxing , MOHURD

Signatories:

Assistant Secretary David B. Sandalow, DOE
Deputy Director General MA Linying, MOST

Country Directors of CERC:

Dr. Robert C. Marlay (for U.S.)
Counselor LIU Zhiming (for China, Not Shown)



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Early Signs of Success

- Tangible outcomes and impacts;
- Relationships continue to expand and deepen;
- Researchers have access to unique experimental platforms;
- Industrial partners gain market knowledge and build relationships;
- Large-scale business ventures explore ways to collaborate with CERC, share data, and accelerate new technology deployment;
- Additional private partners are seeking to join;
- Other countries are taking notice.

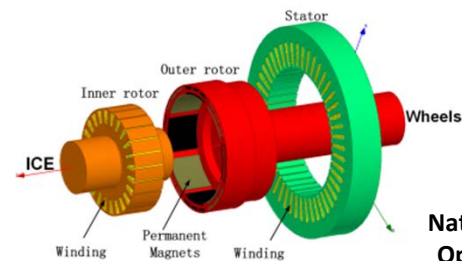
Gibson plant,
Unit-3



Post-Combustion
Capture Retrofit



Shidongkou
Pilot

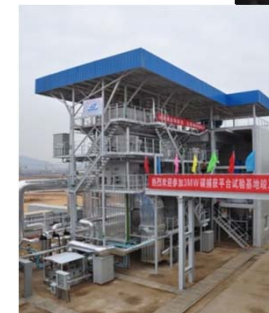


Electrical Variable
Traction-Transmission
machine and drive.

Natural Ventilation
Open Air Building



Oxy-Fuel
3MW_{th} full chain
system (FCS)





U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Key Elements of the CERC Model Attracting Participation

- Leadership and engagement by the two governments at the highest levels; coupled with an active governance structure;
- Ambitious technical projects focused on important problems;
- Strong teams of distinguished scientists and engineers;
- Emphasis on “collaboration”, not just “collegial” interactions;
- Outcomes leveraged by access to big experimental platforms;
- Strong, flexible framework for protecting intellectual property (IP);
- Endorsements and oversight by both governments of IP & TMP arrangements, which encourage cooperation & compliance; and
- A guaranteed right for the exploitation of IP in the other country’s territory, which can potentially facilitate access to expanded markets for new technologies.



U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Meeting Agenda

- Three Technical Briefings:
 - Buildings Energy Efficiency
 - Advanced Coal Technology
 - Clean Vehicles
- Update on CERC Intellectual Property
- Partners Round-Table & General Discussion
- Closing Remarks, Guidance and Follow-On Actions