



中美清洁能源联合研究中心 建筑节能联盟合作项目简报

2017 年第 1 期

中美清洁能源联合研究中心建筑节能联盟
住房和城乡建设部科技与产业化发展中心

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本期主要内容

- 2017 年 3 月和 6 月，住房和城乡建设部科技与产业化发展中心分别举办了主题为“净零能耗建筑概念与发展路线图”和“净零能耗建筑示范工程技术分享”的研讨活动。
- 2017 年 6 月，中国建筑科学研究院、深圳市建筑科学研究院股份有限公司两家任务承担单位组织完成任务开题工作。

季度系列活动之一：

净零能耗建筑概念与发展路线图

3 月 29 日，住房和城乡建设部科技与产业化发展中心在北京清华大学建筑节能中心三层会议室主办了“净零能耗建筑概念与发展路线图”主题研讨会。会议邀请了研究机构、高校、企业等单位的多名专家，围绕净零能耗建筑

的概念、发展路线、技术要点等内容作了精彩发言和广泛交流。



与会专家指出，研究实现净零能耗建筑，提炼关键技术问题，符合行业发展趋势、国家能源安全以及提高居民生活水平的需求。

建造净零能耗建筑宜采用“被动优先，主动优化”的理念，通过优先利用被动建筑技术降低建筑能源负荷。

基于目前国家建筑业发展环境，在推广净零能耗建筑时应当因地制宜，稳步推进。应了解协调建设各方利益关切，为净零能耗建筑普及落地提供切实可行的政策技术支持。（住房和城乡建设部科技与产业化发展中心供稿）

季度系列活动之二：

净零能耗建筑示范工程技术分享

6月7日，住房和城乡建设部科技与产业化发展中心和美国劳伦斯伯克利国家实验室共同主办的中美清洁能源联合研究中心建筑节能领域(以下简称 CERC-BEE)净零能耗建筑示范工程技术分享会于第八届清洁能源部长级会议(CEM8)期间在北京国家会议中心正式召开。本次会议旨在交流 CERC-BEE 第二个五年围绕“净零能耗建筑”关键技术研究及示范的目标和进展。来自中美两国的管理部门、研究机构、非营利组织及企业的近百位代表参加了会议。会议由住房和城乡建设部科技与产业化发展中心刘幼农副处长主持，住房和城乡建设部建筑节能与科技司全贵婵处长和美国能源部国际事务部 Maria Digiulian 女士致欢迎辞。

全贵婵处长首先对 CERC-BEE 1.0 (2010-2015) 工作做了充分肯定，并就 CERC-BEE 2.0(2016-2019) 围绕“净零能耗建筑”关键技术研究及示范的研究任务提出了新的期许，她指出，在中央城市工作会议以及住房和城乡建设部建筑节能与绿色建筑“十三五”发展规划中，一直在探索建筑节能未来的发展方向：按照以前工作步骤中 30%、50%、65% 节能率的路径前进还是一种

跨越式走净零能耗建筑的发展道路。从国际合作角度来讲，通过与国际同行交流合作，帮助找到适应中国建筑节能行业发展需求的道路，是多年来国际合作的指导思想。对项目得到科技部支持表示感谢，同时希望项目参与单位积极参与和支持，共同为全国建筑节能事业发展建言献策。美国能源部国际事务部 Maria Digiulian 女士高度赞扬了两国研究团队在建筑节能领域取得的合作成效，并指出 CERC-BEE 作为 CERC 五大合作领域中的合作典范，在未来的合作中既面临着挑战，也同时创造了大量机会，中美两国应该更加紧密的合作，在经济发展、环境保护以及节能减排领域取得更多的成果。



美国劳伦斯伯克利国家实验室中国能源组周南主任分享了 CERC-BEE 1.0 的科研成果以及对中美节能减排工作的积极影响。住房和城乡建设部科技与产业化发展中心马欣伯博士就 CERC-BEE 2.0 净零能耗建筑关键技术研究及示范的研究计划进行了介绍。



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随后，会议以“创新实践：超低能耗建筑技术集成与应用”和“未来展望：零能耗建筑研究与探索”两个主题进行了相关案例的技术分享。

会议由美国劳伦斯伯克利国家实验室中国能源组周南主任和住房和城乡建设部科技发展促进中心高立新总工程师进行了总结。周南主任指出，CERC-BEE 示范工程的技术分享极具意义，为项目参与各方提供了技术借鉴，并表示对下一步技术开发充满信心，同时也欢迎更多的伙伴加入研发团队。高立新总工程师充分肯定了 CERC-BEE 1.0 的工作成果，并指出，住房和城乡建设部科技与产业化发展中心将与 CERC-BEE 联盟成员单位共同开展技术研究，建成一批具有代表性的技术集成示范工程，推动中美两国建筑节能水平向更高层次发展，特别是利用开展净零能耗建筑关键技术与示范的契机，引领未来全球建筑节能事业发展。



通过本次会议，中美双方团队沟通交流了 CERC-BEE 研究工作情况，积极展示和分享了技术集成与应用成果，对推动研究任务的落实与开展、扩大 CERC-BEE 联盟影响力以及深化中美

两国科技合作发挥了重要作用。（住房和城乡建设部科技与产业化发展中心供稿）

工作动态

“建筑能源系统在线调适与数据挖掘关键技术研究”任务启动

6月12日，中美清洁能源联合研究中心（CERC）建筑节能项目“净零能耗建筑关键技术与示范”（2016YFE0102300）任务四“建筑能源系统在线调适与数据挖掘关键技术研究”启动会在中国建筑科学研究院召开。住房和城乡建设部科技与产业化发展中心马欣伯博士、中国建筑科学研究院环能院徐伟院长、邹瑜副院长，来自中国建筑节能协会、清华大学、中国城市建设研究院、北京建筑大学等单位的专家出席了会议。会议由中国建筑科学研究院科技处尹波处长主持。



住房和城乡建设部科技与产业化发展中心马欣伯博士介绍了项目整体进展并对任务开题做出具体要求。任务承担单位和参与单位分别对研究任务

和技术路线进行了汇报，评审专家认真听取汇报，并给出了指导意见和建议。

“建筑能源系统在线调适与数据挖掘关键技术研究”将以中国建筑科学研究院近零能耗示范建筑、珠海兴业示范楼、江森自控全球总部、迪士尼中国研究示范建筑为载体，研究如何基于移动互联网，在满足建筑内部全体用户个性化需求基础上，使建筑物能源系统运行最优，建筑物能耗达到最低的关键技术。（中国建筑科学研究院供稿）

“夏热冬暖地区‘净零能耗建筑’ 关键技术综合性工程示范” 召开启动会

6月15日，中美清洁能源联合研究中心建筑节能项目“净零能耗建筑关键技术与示范”（2016YFE0102300）任务二“夏热冬暖地区‘净零能耗建筑’关键技术综合性工程示范”启动会在深圳国际低碳城顺利召开。

会议邀请了住房和城乡建设部科技发展促进中心梁俊强副主任、马欣伯博士，美国劳伦斯伯克利国家实验室冯威博士、广东省建筑科学研究院、南京国臣直流配电科技有限公司、深圳供电局有限公司、格力电器国家重点实验室、香港理工大学、清华大学、北京建筑大学和北京博锐尚格节能技术股份有限公司的嘉宾；同时深圳市建筑科学研究

院股份有限公司叶青董事长、刘俊跃副总经理以及相关同事出席了此次会议。

任务负责人郝斌介绍了研究内容及进展，冯威博士介绍了美方项目研究进展。任务参与单位分别介绍了各自承担的研究内容、计划及进展等。



与会专家和领导认真听取了汇报，形成了三点意见：一是肯定了任务研究技术路线的合理性与清晰性；二是任务参与单位覆盖了从供电、中低压配电、电器、运营解决方案、用户、高校等，形成一个小完整的能源需求、供应、输配链，对直流建筑的研究及落地提供了很好的团队支撑。三是坚持目标导向，保持中美双方合作，以示范工程为载体，完成好课题研究任务。

与会领导与专家还参观了未来立方直流实验室。



（深圳市建筑科学研究院股份有限公司供稿）



U.S.-China Clean Energy Research Center (CERC)

Joint Research Projects on Building Energy Efficiency

Briefing

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U.S.-China Clean Energy Research Center Building Energy Efficiency Consortium

Center of Science and Technology and Industrialization Development, MOHURD

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Contents

- The Center of Science and Technology of Construction (CSTC) of Ministry of Housing and Urban-Rural Development (MOHURD) has held seminars themed “Concept and Roadmap of Net-Zero Energy Building” and “Workshop Demonstration of Net-Zero Energy Building Technology” in March and June respectively.
- June 2017, the two responsible task owners -- China Academy of Building Research (CABR) and Shenzhen Institute of Building Research Co., Ltd. have completed project kick-off.

Quarterly series event No. 1:

Concept and Roadmap of Net-Zero Energy Building

March 29, the CSTC of MOHURD hosted seminar themed “Concept and Roadmap of Net-Zero Energy Building” in the Building Energy Efficiency Center of Tsinghua University in Beijing. Experts from research institutions, universities, enterprises and other units were invited to make excellent statements and extensive exchanges on the

concept, development roadmap and technology of net-zero energy building.



Participants pointed out that the study to realize net-zero energy building and to refine key technology issues is in line with industry trends, national energy security and the need of improving people’s living standards.

The construction of net-zero energy building shall adopt the concept of “passive priority, proactive optimization”, meaning to reduce building energy load by giving priority to the use of passive building technology.

Based on the current national building industry environment, the promotion of net-zero energy building should be conducted according to local conditions and of steady progress. The interests of each party shall be considered and coordinated to provide a solid and reliable policy support for the landing of net-zero energy building. (CSTC of MOHURD)

Quarterly series event No. 2:

Workshop Demonstration of Net-Zero Energy Building Technology

June 7, Workshop Demonstration of Net-Zero Energy Building Technology of U.S. – China Clean Energy Research Center – Building Energy Efficiency (hereinafter referred to as CERC-BEE) co-sponsored by CSTC of MOHURD and U.S. Lawrence Berkeley National Laboratory (LBNL) was held in China National Convention Center during the Eighth Clean Energy Ministerial (CEM8) period. The meeting aims to exchange CERC-BEE objectives and progress of the second five-years on key technology research and demonstration of “Net-Zero Energy Building”. Nearly 100 representatives of management, research institutes, nonprofit organizations and enterprises from both China and U.S. attended the meeting. The meeting was hosted by Ms. Liu Younong, Deputy Division Director of CSTC of MOHURD. Ms. Tong Guichan, Division Director of Building Energy Efficiency and Science & Technology Department of MOHURD, and Ms. Maria Digiulian from U.S. DOE Department of International Affairs gave welcome speeches.

Director Tong Guichan first fully affirmed the work of CERC-BEE 1.0 (2010-2015) and put forward new expectations on CERC-BEE 2.0 (2016-2019) key technology research and demonstration of “Net-Zero Energy Building”. She pointed out that the future direction of building energy efficiency has been exploring in the Central Urban Work Conference and the “Thirteenth Five-year” plan of building energy efficiency and green building of MOHURD – whether continue the previous path of 30%, 50 %, 65% energy saving rate or to go net-zero energy building path. From the perspective of international collaboration,

through cooperation with international counterparts to help find the right way for China’s building energy efficiency development is the guiding ideology of international collaboration over the years. She thanked the support from Ministry of Science and Technology and hope for the participants to get fully involved and make contribution to national building energy efficiency work. Ms. Maria Digiulian from U.S. DOE Department of International Affairs highly recognized the cooperative achievements of building energy efficiency by China and U.S. research teams and pointed that CERC-BEE, as a model of collaboration in the five collaboration areas of CERC, faces challenges in the future, but also created a lot of opportunities. China and U.S. should work together closely and achieve more in economic, environmental protection and energy saving & emission reduction.



Ms. Zhou Nan, Director of China Energy Group of LBNL shared the CERC-BEE 1.0 research results and the positive impact on energy-saving and emission reduction work in China and U.S. Dr. Ma Xinbo, CSTC of MOHURD introduced CERC-BEE 2.0 research plan of key technology research and demonstration on net-zero energy building.



Later technology sharing related to “Integrated Application and Practice of Innovative Technology in Ultra-Low Energy Buildings” and “Research and Exploration of Net-Zero Energy Building” was discussed.

The meeting was summarized by Ms. Zhou Nan, Director of China Energy Group of LBNL and Mr. Gao Lixin, Chief Engineer of CSTC of MOHURD. Zhou pointed out that the technology sharing of CERC-BEE demonstration project was of great significance, which provided technical reference for the project participants. She expressed high confidence in the next technology development and welcomed more partners to join the research team. Gao has fully affirmed the work of CERC-BEE 1.0 and pointed out that the CSTC of the MOHURD will work with CERC-BEE members to carry out technology research and build a batch of representative technology-integrated demonstration projects to promote China and U. S. building energy efficiency to a higher level. In particular the key technology research and demonstration of net-zero energy building would become an opportunity to lead the future development of global building energy efficiency.



Through this meeting, China and U.S. teams communicated the CERC-BEE research work, demonstrated and shared the achievements of technology integration and application, which has played an important role in promoting research development, expanding the influence of CERC-BEE and deepening China and U.S. technology cooperation. (CSTC of MOHURD)

Recent Work

The task of “Research on the Key Technology of Building Energy System On-line Adjustment and Data Mining” was kicked-off

June 12, the building energy efficiency project “Key Technology Research and Demonstration of Net-Zero Energy Building” (2016YFE0102300) of U.S. - China Clean Energy Research Center (CERC) Task 4 – “Research on the Key Technology of Building Energy System On-line Adjustment and Data Mining” kick-off meeting was held in CABR. Dr. Ma Xinbo of CSTC of MOHURD, Head Mr. Xu Wei and Deputy Head Mr. Zou Yu of Building Environment and Energy Efficiency Research Department CABR, and experts from China Association of Building Energy Efficiency, Tsinghua University, China Urban Construction Design & Research Institute, Beijing University of Civil Engineering and Architecture, etc. attended the meeting. The meeting was hosted by Yin Bo, Director of Science and Technology Department, CABR.



Dr. Ma Xinbo introduced the overall progress of the project and make specific requirements of the task kick-off. The task owners and the participants reported the research tasks and technology path respectively, and the reviewers listened carefully to the report and provided guidance and suggestions.

“Research on the Key Technology of Building Energy System On-line Adjustment and Data Mining” will subject Net-Zero Energy Demo Building of CABR, Zhuhai “Green Yes” Ultra-Low Energy BIPV Demonstration Building, Shanghai

Headquarters of Johnson Controls, Disney Living Lab demonstration building, to study the key technologies to meet the individual needs of all users in the building, to optimize the operation of building energy system, and to achieve minimum building energy consumption based on mobile internet. (CABR)

Kick-off meeting of “Demonstration of ‘Net-Zero Energy Building’ Key Technology in Hot Summer and Warm Winter Area” was Held

June 15, the building energy efficiency project “Net-Zero Energy Building Key Technology Research and Demonstration” (2016YFE0102300) of China – U.S. Clean Energy Research Center Task 2 – “Demonstration of ‘Net-Zero Energy Building’ Key Technology in Hot Summer and Warm Winter Area” kick-off meeting was successfully held in Shenzhen International Low Carbon City.

Deputy Director Liang Junqiang and Dr. Ma Xinbo of CSTC, MOHURD, Dr. Feng Wei of LBNL, representatives of Guangdong Provincial Academy of Building Research, Golden Cooperate Information & Automation Technology (Nanjing) Co., Ltd, Shenzhen Power Supply Co., Ltd., State Key Laboratory of Gree Electric Appliances, Hong Kong Polytechnic University, Tsinghua University, Beijing University of Civil Engineering and Architecture and Beijing Persagy Energy Technology Co., Ltd. was invited to the meeting. Also CEO Mr. Ye Qing, Deputy Manager Mr. Liu Junyue and related colleagues of Shenzhen Academy of Building Research attended the meeting.

Task Director Hao Bin introduced the research content and progress and Dr. Mr. Feng Wei introduced the U.S. project research progress. Task participants

respectively introduced their research contents, plans and progress.



The experts and leadership listened carefully to the reports and formed three piece of advice. First they affirmed the feasibility and clarity of task research technical path. Second, the task participants cover a complete small energy chain of demand, supply and transmission including the power supply, low-voltage distribution, electric appliances, operational solutions, users, colleges and universities, etc., which is a good support team for DC building research and landing. Third, a good research task requires a goal-oriented cooperation between China and U.S. subjects to demonstration projects.

Leadership and experts also visited the Future Cube DC Laboratory.



(Shenzhen Academy of Building Research Co., Ltd.)