

**Agenda of 4th U.S.-China CO₂ Emissions Control Science
& Technology Symposium**
第四届中美 CO₂ 控制技术研讨会日程

Hosted by 主办

U.S. Department of Energy/National Energy Technology Laboratory
美国能源部国家能源技术实验室

Chinese Ministry of Science & Technology/Department of High and New Technology
Development and Industrialization
中国科技部高新技术发展和产业化司

Organized by 承办

Zhejiang University, China
浙江大学

West Virginia University, USA
西弗吉尼亚大学

Co-organized by 协办

China Petroleum University (Beijing), P.R. China
中国石油大学（北京）

China Petroleum and Chemical Industry Federation
中国石油化工联合会

Energy Research Association of Zhejiang Province, P.R. China
浙江省能源研究会

University of Wyoming, USA
怀俄明大学

Hangzhou, People's Republic of China
中国 杭州

September 20-22, 2014

Chairman 会议主席

Prof. Zhongyang Luo, Dean, College of Energy Engineering, Zhejiang University, P.R.
China

骆仲泐教授 浙江大学能源工程学院院长

Mr. Scott Smouse, Technology manager for Advanced Combustion/International
Advisor, Department of Energy, United States of America

Organizing Committees 组织委员会

Professor Jerald J. Fletcher West Virginia University, USA

Professor John Jiao University of Wyoming, USA

Professor Qingyun Sun West Virginia University, USA

Professor Mingyuan Li China Petroleum University (Beijing), P.R. China

Professor Xiaochun Li Institute of Rock and Soil Mechanics, Chinese
Academy of Sciences, P.R. China

Professor Mengxiang Fang Zhejiang University, P.R. China

Professor Bo Peng China Petroleum University (Beijing), P.R. China

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September 20, Saturday (Main Lobby, 宾馆大堂)	
9:00-18:00 Registration (注册)	
September 20, Saturday 星期六下午 (Osmanthus Room, VIP Building, 贵宾楼桂雨厅)	
14:00-14:30 Opening Ceremony (开幕式)	
Chairs: Dr. Zhongyang Luo, Professor, Zhejiang University, PRC 浙江大学骆仲泐教授	
Professor Jerald J. Fletcher, West Virginia University, USA	
14:00-14:10 Welcoming Remarks, 致欢迎词	
Mr. Scott Smouse, Technology manager for Advanced Combustion/International Advisor, Department of Energy, United States of America	
14:10 – 14:20 Welcoming Remarks, 致欢迎词	
Mr. Zheng Fangneng, Deputy Director, Department of High Technology & Industrialization, Chinese Ministry of Science & Technology	
科技部高新处郑方能处长	
14:20 – 14:30 Welcoming Remarks 致欢迎词	
Prof. Guping Zhou, Vice President of Zhejiang University, China	
浙江大学周谷平副书记	
14:30-16:00	Plenary session 1-Overview of CCUS (大会报告 1-CO₂ 捕集利用封存现状) (20min presentation,10min questions) Chairs: Dr. Zhongyang Luo, Professor, Zhejiang University (PRC) 浙江大学骆仲泐教授 Professor Jerald J. Fletcher, West Virginia University, USA 14:30-15:00 Global Overview of CCS Activities and US Policies- Sarah Forbes, WRI (USA) 美国 CCS 行动和政策 15:00-15:30 Overview of China activity on CCUS, Mr. Fangneng Zheng. MOST (PRC), 中国 CCUS 行动, 科技部高新处郑方能处长 15:30-16:00 Overview of USDOE's Advanced Combustion R&D Program. Scott Smouse Technology manager for Advanced Combustion/International Advisor, Department of Energy, United States of America 美国能源部先进燃烧计划, 美国能源部先进燃烧技术项目经理/国际顾问
16:00-16:30	Coffee break and take picture (茶歇, 拍照)
16:30-18:00	Plenary session 2-CCS Progress (大会报告 2-技术进展) (20min presentation,10minquestions) Chairs: Prof. Li Mingyuan, China Petroleum University(Beijing) 中国石油大学李明远教授 Sarah Forbes (USA)

	<p>16:30-17:00 CCS technology Development in Huaneng Group, Dr. Shisheng Xu, Director of Clean Energy Research Institute, Huaneng Group 华能集团 CCS 技术发展, 许世森院长, 华能清洁能源研究院</p> <p>17:00-17:30 Energy and System Analysis on Aqueous Post-Combustion CO₂ Capture Technology, Kunlei Liu, Uky (USA) 燃烧后捕集能源和系统分析, 刘坤磊所长, 肯塔基大学</p> <p>17:30-18:00 Research and Development of Oxyfuel Combustion in China, Prof. Chuguang Zheng, Huazhong University of Science and Technology (PRC) 中国富氧燃烧技术研发, 郑楚光教授, 华中科技大学</p>
<p>18:50-20:30 Banquet (宴会) (Osmanthus Room, VIP Building, 贵宾楼桂雨厅)</p>	
<p>September 21, Sunday</p>	
8:30-10:30	<p>Plenary session3-CO₂ Capture (大会报告 3-CO₂ 捕集) (Osmanthus Room, VIP Building, 贵宾楼桂雨厅) (20min presentation, 10min questions)</p> <p>Chairs: Prof. Rui Xiao, Southeast University, PRC, 东南大学肖睿教授 Dr. Kunlei Liu, USA</p> <p>8:30-9:00 The Progress of Sinopec CCUS Technology and Project, Dr. Yuanyuan Zhang, Senior Engineer, Sinopec Petroleum Engineering Corporation, PRC, 中石化 CCUS 技术发展, 张媛媛博士, 中石化石油工程设计有限公司</p> <p>9:00-9:30 Carbon Capture and Sequestration Technical Capabilities of the INL, Richard Boardman, Idaho National Lab(USA) Presented by KP Lau, from Fraser Energy, INL CO₂ 捕集和封存技术潜力</p> <p>9:30-10:00 Research Prospect of CO₂ Chemical Absorption, Prof. Mengxiang Fang, Zhejiang University, PRC 化学吸收技术研究前景, 方梦祥教授, 浙江大学</p> <p>10:00-10:30 Air Products Oxyfuel Technology Introduction, Changrong Peng, Air Products(USA) 富氧燃烧技术介绍, 美国 AP 公司</p>
10:30-11:00	Coffee Break
11:00-12:30	<p>Plenary session 4- Storage and Utilization (大会报告 4-CO₂ 储存和利用) (Osmanthus Room, VIP Building, 贵宾楼桂雨厅) (20min presentation, 10min questions)</p> <p>Chairs: Gao Ruiming, Yanchang Petroleum (PRC) 高瑞民院长, 延长石油 Tim Carr (USA)</p>

	<p>11:00-11:30 CO₂-EWR: A Cleaner Solution for China's Coal Chemical Industry and in Combination with CO₂-EOR for An Early Opportunity, Prof. Qi Li, Institute of Rock and Soil Mechanics, Chinese Academy of Sciences (PRC) CO₂ 驱水和驱油结合在煤化工领域应用清洁解决方案和早期机会, 李琦教授, 中科院武汉岩土力学研究所</p> <p>11:30-12:00 U.S. Southeast Regional Carbon Sequestration Partnership-Cranfield Early Test, Susan D. Hovorka , University of Texas at Austin (USA) 美国东南区域 CO₂ 捕集项目- Cranfield 早期试验, 美国德克萨斯奥斯丁大学</p> <p>12:00-12:30 Mechanism of CO₂-EOR , Prof. Mingyuan Li, China Petroleum University (PRC) CO₂-EOR 机理研究, 李明远教授, 中国石油大学 (北京)</p>
12:30-14:00	Lunch (Buffet)
14:00-16:00	<p>Session 1A Post Combustion (分会 1A, 燃烧后捕集) (Huagang Hall, Main Building, 主楼花港厅) (15min presentation, 5min questions)</p> <p>Chairs: Prof. Mengxiang Fang, PRC 浙江大学方梦祥教授</p> <p>Michael Wilson (USA)</p> <p>14:00-14:20 Development of chemical absorption for CO₂ capture, Associate Prof. Shujuan Wang, Tsinghua University (PRC) CO₂ 化学吸收研究, 王淑娟副教授, 清华大学</p> <p>14:20-14:40 Development of cost-effective chemical solvents and new process configuration for CO₂ capture, Prof. Zhiwu Liang, Hunan University (PRC) 低成本化学吸收剂和新工艺开发, 梁志武教授, 湖南大学</p> <p>14:40-15:00 Novel CO₂ capture process by using Ionic Liquids, Xiangping Zhang, Haifeng Dong, Suojiang Zhang, Institute of Process Engineering, Chinese Academy of Sciences, PRC 离子液体 CO₂ 捕集工艺, 中科院过程所</p> <p>15:00-15:20 Research on the quality improvement of synthetic natural gas (SNG) from coal via the combined technology of CO₂ membrane separation-chemical absorption, Prof. Zhongxiao Zhang, Shanghai Jiao Tong University, PRC 膜分离和化学吸收耦合用于天然气分离研究, 上海交通大学</p> <p>15:20-15:40 The study of CO₂ regeneration in membrane flash process, JinMing Xing, JiangHui Song, Ye Yang, Qian Ma, WeiDong Zhang*, Beijing University of Chemical Technology, Beijing 100029, China.</p>

	<p>CO2 膜闪蒸工艺再生研究, 北京化工大学</p> <p>15:40-16:00 Enhanced Carbon Capture and Utilization in Power Plants through Hybridization with Grid Load Dynamics, Richard Boardman, INL (USA), Presented by KP Lau, from Fraser Energy 电站 CO2 捕集和利用随着电网负荷动态强化</p>
	<p>Session 1B Storage and Utilization (分会 1B, 埋存和利用) (Longjing Hall, Main Building, 主楼龙井厅) (15min presentation,5min questions)</p> <p>Chairs: Prof. Peng Bo (Petroleum University) (PRC) 彭勃教授, 中国石油大学(北京) Craig Hart (USA)</p> <p>14:00-14:20 Pre-feasibility Study to Identify Opportunities for Increasing CO2 Storage in Deep, Saline Aquifers by Active Aquifer Management of Treatment of Produced water, Philip Stauffer, LANL (USA) 增加 CO2 在深部咸水层埋存和采水机会预可行性</p> <p>14:20-14:40 Integrated CCUS Industrialized Demonstration of Yanchang Petroleum, Gao Ruiming, Yanchang Petroleum (PRC) 延长石油 CCUS 工业示范, 高瑞民院长, 延长石油</p> <p>14:40-15:00 Detailed CO2 storage site characterization: the key to optimization performance and maximizing storage capacity, John Jiao, UWy. (USA) CO2 埋存点特征: 优化和加大埋存能力的关键</p> <p>15:00-15:20 Dispersion property of CO2 in organic liquid, Dr. Yang, China Petroleum University CO2 在有机液体的扩散特性, 杨子浩博士, 中国石油大学</p> <p>15:20-15:40 China – United States Carbon Utilization and Storage Atlas v1.0, Tim Carr, WVU (USA) 中美 CO2 利用和储存地图集 v1.0</p> <p>15:40-16:00 Mutate and domesticate microalgae species to fix high concentrations of CO2 in flue gas, Prof. Cheng Jun, Zhejiang University(PRC) 固定烟气中高浓度 CO2 微藻的变异和驯化, 程军教授, 浙江大学</p>
16:00-16:30	Coffee break
16:30-18:10	<p>Session 2A Advanced Combustion (分会 2A, 先进燃烧) (Huangang Hall, Main Building, 主楼花港厅) (15min presentation,5min questions)</p> <p>Chairs: Dr. Shujuan Wang , Tsinghua University(PRC) 王淑娟博士, 清华大学 Qingyun Sun (USA)</p>

	<p>16:30-16:50 Conceptual Design of Power Generation based Pressurized Oxygen-rich Coal/MSW Combustion, Prof. Weiping Yan, North China Electric Power University 基于加压富氧煤和垃圾燃烧电站概念设计, 阎维平教授, 华北电力大学</p> <p>16:50-17:10 Research on chemical looping gasification and combustion, Prof. Qinghui Wang, Zhejiang University, P. R 化学链气化和燃烧研究, 王勤辉教授, 浙江大学</p> <p>17:10-17:30 Investigation of pressurized chemical-looping combustion of coal with iron ore as oxygen carrier, Prof. Rui Xiao, Southeast University 以铁矿石作为载氧体煤加压化学链燃烧研究, 肖睿教授, 东南大学</p> <p>17:30-17:50 The separate physico-chemical effects of carbon dioxide on coal char combustion in O₂/CO₂ environments, Prof. Yuegui Zhou*, Shanghai Jiao Tong University, China O₂/CO₂气氛下CO₂对煤焦燃烧物理化学影响, 周月桂教授, 上海交通大学</p> <p>17:50-18:10 CO₂ Negative Emissions By Direct Air Capture, Dr. Tao Wang, Zhejiang University 直接空气捕集CO₂负排放, 王涛博士, 浙江大学</p>
	<p>Session 2B CCUS Chain Issue (分会 2B, CCUS 产业)</p> <p>(Longjing Hall, Main Building, 主楼龙井厅)</p> <p>(15min presentation, 5min questions)</p> <p>Chairs: Prof. Bing Liang Shichun University 梁斌教授, 四川大学</p> <p>Mark Crocker (USA)</p> <p>16:30-16:50 Beyond CDM: Possible Financing Paths for CCS under the UNFCCC, Craig Hart(USA) CDM 以外 CCS 融资途径</p> <p>16:50-17:10 Standard System Construction of CCS, Prof. Bo Peng, China Petroleum University (Beijing) CCS 标准建立, 彭勃教授, 中国石油大学(北京)</p> <p>17:10-17:30 Tail gas carbon dioxide capture and cryogenic liquid new process, Mao Hengsong, Jiangsu Hanlong Environmental Protection Ltd 尾气二氧化碳捕获及低温液化新工艺, 沈少锋, 毛恒松, 江苏汉龙环保科技有限公司</p> <p>17:30-17:50 Demonstration of an Algae Based System for the Beneficial Reuse of Carbon Emissions, Michael Wilson, University of Kentucky (USA) 基于碳利用微藻示范, 肯塔基大学</p> <p>17:50-18:10 Strategy for CCUS in Petroleum Industry in China, Prof. Bo Peng, China Petroleum University (Beijing) 中国石油工业 CCUS 发展战略, 彭勃教授, 中国石油大学(北京)</p>

18:10-20:00 Dinner

September 22, Monday

8:30-10:30

Session 3A CO₂ Capture (分会 3A, CO₂ 捕集)

(Huagang Hall, Main Building, 主楼花港厅)

(15min presentation, 5min questions)

Chairs: Prof. Zhiwu Liang, Hunan University(PRC)

梁志武教授, 湖南大学

TBD(USA)

8:30-8:50 Investigation on the performance of MgO–CaCO₃ absorbent for CO₂ capture, Xinfang Yang, Lifeng Zhao, Yunhan Xiao, Institute of Engineering Thermophysics, Chinese Academy of Sciences, Beijing, 100190, China MgO–CaCO₃ 吸收剂性能研究, 中科院过程所

8:50-9:10 Study on CO₂ Carbonation in Diisobutylamine-Ca²⁺ /Mg²⁺-Rich Aqueous Solutions System, Wenlong Wang, Man Wang, Xin Liu, Peng Wang, Zhenqian Xi, National Engineering Laboratory for Coal-fired Pollutants Emission Reduction, Shandong University, Jinan, China 二异丁胺 Ca²⁺ /Mg²⁺富液系统中 CO₂ 碳化研究, 山东大学

9:10-9:30 Experimental research on the New method of ammonia decarbonization technology based on Salting-out precipitation with low carbonized ratio , Dr. Zhang Yu, Institute of Combustion Engineering, Harbin Institute of Technology 基于盐分离氨水脱碳技术新方法, 哈尔滨工业大学

9:30-9:50 Mass Transfer Performance of Structured Packings in a CO₂ Absorption Column, Chuan Tong, Xiaodan Yu, Wei Yang, Jian Chen*, Wanfu Wang, State Key Lab of Chemical Engineering, Tsinghua University CO₂吸收塔中填料传质性能, 清华大学

9:50-10:10 Dynamic performance of the CO₂ capture unit using aqueous MEA solution, Xu Zhaofeng, XueYali, Liu Pei and Li Zheng, Dept of Thermal Engineering, Tsinghua University MEA吸收剂CO₂捕集系统动态特性, 清华大学许兆峰

10:10-10:30 Influence of Absorbent Viscosity on the Solute Mass Transfer Behavior in Gas Membrane Absorption Process, XianHang Jin, XueLing Yuan, JinMing Xing, JingChao Liu, WeiDong Zhang*, State Key Laboratory of Chemical Resource Engineering, Beijing University of Chemical Technology 吸收剂粘度对 CO₂ 吸收膜传质影响, 北京化工大学

	<p>Session 3B Storage and Utilization (Longjing Hall, Main Building, 主楼龙井厅) (15min presentation,5minquestions)</p> <p>Chairs: Prof. Zhiwu Laing (PRC) Michael Wilson (USA)</p> <p>8:30-8:50 Mineralization of CO₂ with industrial solid waste and natural ore, Prof. Bing Liang, Shichun University 利用工业废渣和自然矿进行 CO₂ 矿化, 梁斌教授, 四川大学</p> <p>8:50-9:10 Algae conversion to fuels, Mark Crocker, UKY (USA) 微藻用于制燃料</p> <p>9:10-9:30 Enlightenment of offshore oil and gas field development for the ocean CO₂ sequestration. Dr. Zhiren He, China Petroleum University (Beijing) 海上油气田开发用于 CO₂ 埋存, 中国石油大学</p> <p>9:30-9:50 Efficient conversion of CO₂ into chemicals through hydrothermal reaction with nickel foams, Xin Wang, Zhejiang University, Hangzhou, China 利用镍水热反应实现 CO₂ 转化为化工品, 浙江大学</p> <p>9:50-10:10 Photoelectrocatalytic Reduction of CO₂ into Chemicals with Pt-RGO/Pt-TNT Composite Catalyst, Meng Zhang, Zhejiang University, Hangzhou, China 光电催化实现 CO₂ 转化为化工品, 浙江大学</p>
10:30-11:00	Coffee break
11:00-12:00	<p>Panel Discussion: Challenge and Cooperation of US and China on CCUS (主题讨论: 中美两国在 CCUS 挑战和合作) (Longjing Hall, Main Building, 主楼龙井厅)</p> <p>Chairs: Prof. Jerry Fletcher, WVU (USA) Prof. Mengxiang Fang, Zhejiang University</p> <p>Invited Specialist: Prof. Mingyuan Li (Petroleum University) (PRC) Prof. Bing Liang, ShiChun University Prof. Zhiwu Liang (PRC) John Jiao, Mark Crocker, Mark Northam (USA)</p> <p>Topics(TBD): Experience of CO₂ emission control from US and China CCS obstacle and challenge for industry Cooperation opportunity between US and China</p>
12:00-12:20	Closing Ceremony (闭幕式)

	<p style="text-align: center;">Chairs: Professor Jerald J. Fletcher, West Virginia University, USA Dr. Zhongyang Luo, Professor, Zhejiang University, PRC</p> <p>1 Closing Remarks – Mr. Scott Smouse, U.S. Department of Energy National Energy Technology Laboratory (USA)</p> <p>2 Closing Remarks –Professor Jerald J. Fletcher, West Virginia University, USA</p> <p>3 Closing Remarks –Dr. Zhongyang Luo, Professor, Zhejiang University, PRC</p>
12:20-13:30 Lunch	