

# US-China Research Collaboration Meeting

Jointly organized by

Virginia Tech - Advanced Research Institute  
and Tsinghua University, Beijing

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Washington, DC, USA

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**What is the purpose  
behind this meeting?**

# Confucius

What I hear, I forget

What I see, I remember

What I do, I understand



Follow up to  
US-China workshops held at Virginia Tech in Arlington in February 2013  
and Southeast University in Nanjing, China, in May 2014



US-China Workshop:  
Smart Grid Research Opportunity Identification

Southeast University, Nanjing, China  
May 15-16, 2014

URL: <http://www.ari.vt.edu/US-ChinaWorkshop2014/>



# Participants from

## US Organizations

Baylor University  
Case Western Reserve University  
Colorado State University  
George Washington University  
Montana State University  
South Dakota State University  
Texas A&M University  
University of Denver  
University of Kentucky  
University of South Florida  
**Virginia Tech**  
Washington State University

## Chinese Organizations

Changsha University  
Huazhong University  
Hunan University  
North China Elect Power University  
Northeast University  
Shandong University  
**Southeast University**  
**Tsinghua University**  
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State Grid EPRI  
Chinese EPRI

# US-China Joint Research Programs



U.S.-CHINA CLEAN  
ENERGY RESEARCH CENTER

中美清洁能源联合研究中心

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

## Five Year CERC Funding Plan

(Million U.S. Dollars)

		United States		China	Consortium
		DOE	Partners	MOST & Partners	Totals
5-Yr Totals	Advanced Coal	\$12.5	≥ \$12.5	≥ \$25.0	≥ \$50.0
	Buildings	\$12.5	≥ \$12.5	≥ \$25.0	≥ \$50.0
	Clean Vehicles	\$12.5	≥ \$12.5	≥ \$25.0	≥ \$50.0
	<b>TOTAL</b>	<b>\$37.5</b>	<b>≥ \$37.5</b>	<b>≥ \$75.0</b>	<b>≥ \$150.0</b>



# US Research Consortia

West Virginia University - Advanced Coal Technology

University of Michigan – Clean Vehicles

Lawrence Berkeley National Laboratory – Building  
Energy Efficiency



# Examples of UK-China Activities

Engineering and Physical Sciences Research Council (EPSRC-UK)  
and National Natural Science Foundation (NNSF-China)  
Research Collaboration on Energy

Slides provided by:

Prof. Bikash C. Pal

Imperial College

London, United Kingdom



# How were programs initiated?

- **Scoping workshop**

- Scientists from both countries met in a dedicated workshop
- Scientists from respective countries were shortlisted through open call inviting expression of interest
- Various research themes relevant to both countries were identified through brain storming/discussions/presentations



# Next Steps

- **Call for proposal and peer review**

- EPSRC and NNSFC issued a joint call in UK and China simultaneously for research proposal submissions
- Usually 2-3 universities from each side formed consortia and lead PI from both countries arranged teleconference to write proposals with industry support (cash or kind)
- Proposals were independently peer reviewed in both sides
- Scores were compiled and a panel of experts rank ordered proposal considering peer review feedback and panel assessment
- Successful proposals were announced in both countries by very senior government figures in science and technology



# Nature of the collaboration

- Both countries put priority on people exchange
  - Researchers and investigators are to spend specified minimum time in away country
- Ideas are exchanged
  - Annual general assemblies are held to discuss and disseminate the progress
  - International workshop/position papers are written for outreach besides journal paper publications



# **UK-China Smart Grids**

- **Four consortia were funded**
  - Integrated Operation and Planning for Smart Electric Distribution Networks (OPEN)
  - Developing Scalable Smart Grid Infrastructure to Enable Secure Transmission System Control
  - Enhanced Renewable Integration through Flexible Transmission Options (ERIFT)
  - DC Networks with DC/DC Converters for Integration of Large Renewable Sources



# **UK-China Grid Scale Storage**

- **Five consortia were funded**

- Role of energy storage in enhancing operation and stability performance of sustainable power systems (RESTORES)
- Business, Economics, Planning and Policy for Energy Storage in Low-Carbon Futures
- Stability and Control of Power Networks with Energy Storage (STABLE-NET)
- Lower Cost and Longer Life Flow Batteries for Grid Scale Energy Storage
- Next Generation Grid Scale Thermal Energy Storage Technologies (NexGen-TEST)

# UK-China Program Participants

## UK Organizations

Aberdeen University  
Bath University  
Birmingham University  
Brunel University  
Cambridge  
Cardiff University  
Coventry University  
Imperial College  
Liverpool University  
Manchester University  
Oxford University  
Strathclyde University  
Warwick University

## Chinese Organizations

Changsha University  
Harbin Institute of Technology  
Huazhong University  
Hunan University  
North China Electric Power University  
Shandong University  
Shanghai Jiao Tong University  
**Southeast University**  
**Tsinghua University**  
Wuhan University  
Zhejiang University  
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Chinese Academy of Sciences  
Chinese EPRI

# May be we can build similar US-China collaboration projects

## US Organizations

Baylor University  
Case Western Reserve University  
Colorado State University  
George Washington University  
Montana State University  
South Dakota State University  
Texas A&M University  
University of Denver  
University of Kentucky  
University of South Florida  
**Virginia Tech**  
Washington State University

## Chinese Organizations

Changsha University  
Huazhong University  
Hunan University  
North China Elect Power University  
Northeast University  
Shandong University  
**Southeast University**  
**Tsinghua University**  
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State Grid EPRI  
Chinese EPRI



## In Summary

- 13 consortia were funded (between 2012 to 2013)
- £24m pounds on the UK side, RMB 72M on China side
- 240 RA years are employed on UK side, equivalent RAs and about 150 PhDs are employed in China
- Equipment manufactures, grid operators on both sides are active partners
- Both countries have local offices for administering the program
- It is bit early to report any major achievement/outcome



# **Presentations from**

- National Natural Science Foundation of China
- National Science Foundation of the United States
- Selected faculty members from China and USA



# **Presentations from China**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Qixin Chen	Associate Professor	Tsinghua University
Chongqing Kang	Professor	Tsinghua University
Qing Xia	Professor	Tsinghua University
Rui Ma	Professor	Changsha University of Science and Technology
Tianshu Bi	Professor	North China Electric Power University
Yusheng Xue	Professor	State Grid Electric Power Research Inst.
Tang Yi	Associate Professor	Southeast University
Wei-Jen Lee	Professor	University of Texas at Arlington
Hongtao Wang	Professor	Shandong University
Lijian Ding	Professor	National Science Foundation of China



# **Presentations from the US**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
Wei Sun	Assistant Professor	South Dakota State University
Karen Butler-Purry	Professor	Texas A&M University
Anurag Srivastava	Assistant Professor	Washington State University
Minggua Hong	Associate Professor	Case Western Reserve University
Hashem Nehrir	Professor	Montana State University
Lingling Fan	Associate Professor	University of South Florida
Amir Etemadi	Assistant Professor	George Washington University



*Thank You*

Dr. Saifur Rahman

Director and Professor  
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