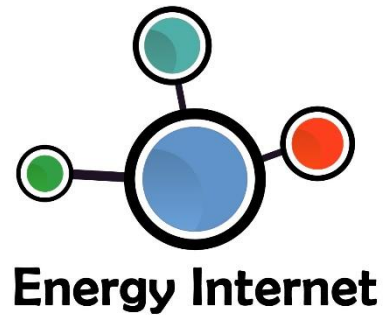


1st IEEE International Conference on Energy Internet

April 17-21 2017



The First  
IEEE International  
Conference on  
**ENERGY  
INTERNET**



APRIL 17-21 2017 | BEIJING, CHINA



# 1st IEEE International Conference on Energy Internet

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## Messages from the chairs:

Welcome to the First IEEE International Conference on Energy Internet (ICEI 2017), held at Beijing, China, April 17-21, 2017.

Energy Internet is an Internet-style solution for bottom-up construction of energy infrastructure and applications. Key features of Energy Internet is decentralized coordination of energy producing and consuming that enable open and peer-to-peer energy sharing. The ideal of Energy Internet is iterative balance among energy generation, storage and consumers in real time. By allowing high-level awareness and involvement in form of cooperation and interaction, secure and reliable delivery of energy is achieved by efficient scheduling, distribution and routing across peers of energy cells in Energy Internet.

IEEE ICEI 2017 focuses on related research areas such as architecture and design, energy switching and routing, information and communication technology, energy management systems, energy market and trading for Energy Internet. This conference provides a platform for researchers, academics and industries from multidisciplinary domains to share their knowledge, ideas and working experiences for Energy Internet. Hopefully, this event will promote more sophisticated technologies and appliances for the benefit of more economic and environment friendly energy utilization across the global.

There are totally 235 submissions, each receiving three reviews. Finally, only 62 papers are accepted, and the rate of paper acceptance is 26%. Regarding these accepted papers, there are totally 220 authors from 70 organizations contributing to this conference. On behalf of the whole conference committee, we would like to say thank you for all these dedicated works.

IEEE ICEI 2017 is co-sponsored by Research Institute of Information Technology, Tsinghua University, China; Tsinghua National Laboratory for Information Science and Technology; Beijing Smart China Energy Internet Research Institute; Technical Committee on Energy Internet, China Energy Research Society; Technical Committee on Energy Internet, Chinese Association of Automation; IEEE Computer Society; IEEE Computer Society Technical Committee on Internet. Their sponsorships support the success of conference.

IEEE ICEI 2017 would not have been successful without the support of many people and organizations. First and foremost, we would like to thank all the authors for submitting their papers to the conference, for their presentations and discussions during the conference. We would like to express our most sincere gratitude to Program Committee members and our professional reviewers, who carried out the most difficult work by carefully evaluating the submitted papers. We would like to give special thanks to the conference sponsors. Last but not least, we would like to thank all conference participants for their contribution and support. We hope that all participants can take this opportunity to share and exchange ideas with one another and enjoy IEEE ICEI 2017.

## General Co-chairs

Junwei Cao, Tsinghua University, China  
Jiye Wang, State Grid, China

## Program Committee Co-chairs

Wenhua Liu, Tsinghua University, China  
Kai Xie, GEIRI, State Grid, China

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## Advanced Program

### Monday Evening – April 17<sup>th</sup>, 2017

#### **Reception & Registration**

Monday, 17 April, 2017, 6:30 PM – 8:00 PM

### Tuesday Morning – April 18<sup>th</sup>, 2017

#### **Plenary Session: Keynote Speeches**

Tuesday, 18 April, 2017, 9:00 AM – 12:00 PM

Session Chair: Junwei Cao, Tsinghua University, China; Jiye Wang, State Grid, China

\*9:00 AM – 9:10 AM

Opening Remarks

\*9:10 AM – 9:50 AM

Demand Side Flexible Resources and Energy Distribution Network: Infrastructure, Operation Mode and Market Mechanism

Yonghua Song, Zhejiang University, China

\*9:50 AM – 10:30 AM

Smart Energy Cyber-Physical Systems: Big Data Analytics and Cyber Security

Shiyan Hu, Michigan Technological University, USA

BREAK (Group Photo)

\*10:40 AM – 11:20 AM

We-Energy and Energy Internet

Huanguang Zhang, Northeastern University, China

\*11:20 AM – 12:00 PM

Energy Internet and Integrated Planning of Electricity and Natural Gas Systems

Zhaohong Bie, Xi'an Jiaotong University, China

### Tuesday Afternoon – April 18<sup>th</sup>, 2017

#### **Regular Session: Complementary Scheduling and Optimization of Multiple Energy Flows (Room I)**

Tuesday, 18 April, 2017, 1:30 PM – 5:10 PM

Session Chair: Shuqing Zhang, Tsinghua University, China

\*1:30 PM – 1:50 PM

Optimal Planning of Clean Heating with Renewable Energy Sources

Jiaxing He, Tsinghua University

Lei Chen, Tsinghua University

Fei Xu, Tsinghua University

Yong Min, Tsinghua University

\*1:50 PM – 2:10 PM

Initialization of Full Electromagnetic Transient Simulation Via A Novel Transition State Calculation

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Jun Liu, Xi'an Jiaotong University  
Xudong Hao, Xi'an Jiaotong University  
Wanliang Fang, Xi'an Jiaotong University  
Zhanhong Wei, Xi'an Jiaotong University  
Tianhang Wei, Xi'an Jiaotong University  
Haichao Xu, Northwest Subsection of State Grid Corporation of China  
Shuanbao Niu, Northwest Subsection of State Grid Corporation of China  
Lin Cheng, Northwest Subsection of State Grid Corporation of China

\* 2:10 PM – 2:30 PM

Multi-objective Optimal Power Flow of Multiple-Energy System Considering Wind Power Penetration

Rui Ma, Changsha University of Science and Technology  
Jiaqian Qin, Changsha University of Science and Technology

\* 2:30 PM – 2:50 PM

The Nested Dissection for the Simulation of Regional Multi-Energy Systems

Yanan Zhu, Tsinghua University  
Shuqing Zhang, Tsinghua University  
Yubo Sun, Tsinghua University  
Siqi Yu, Tsinghua University  
Songtai Yu, Tsinghua University  
Yaping Zhu, Beijing Smart China Energy Internet Research Institute Co. Ltd  
Zhifei Liu, Beijing Smart China Energy Internet Research Institute Co. Ltd

\*2:50 PM – 3:10 PM

Study on Non-cooperative Game Dispatching of Regional Power System with Wind - Fire - Pumped Storage

Guoqing Yang, Xi'an University of Technology  
Jing Fu, Xi'an University of Technology  
Deyi Wang, Xi'an University of Technology  
Yitong Liu, Xi'an University of Technology  
Hang Luo, Xi'an University of Technology

BREAK

\* 3:30 PM – 3:50 PM

Multi-Energy Flow Calculation Method for We-Energy based Energy Internet

Qiuye Sun, Northeastern University  
Yue Chen, Northeastern University

\*3:50 PM – 4:10 PM

The Application of Energy Network Theory in the Analysis of District Electricity and Heating System

Haoyong Chen, South China University of Technology  
Ming Qiu, South China University of Technology  
Hailin Ge, South China University of Technology  
Ming Li, South China University of Technology

\*4:10 PM – 4:30 PM

Load Situation Awareness Design for Integration in Multi-Energy System

Hanmin Cai, Technical University of Denmark  
Shi You, Technical University of Denmark

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Henrik W. Bindner, Technical University of Denmark  
Sergey Klyapovskiy, Technical University of Denmark

\* 4:30 PM – 4:50 PM

Dual Energy Scheduling for Microgrids in Energy Internet: A Non-Cooperative Game Approach

Jie Wu, University of Electronic Science and Technology of China  
Wenhui Zhou, University of Electronic Science and Technology of China, Guangdong University of Technology  
Weifeng Zhong, Guangdong University of Technology  
Yuhua Cheng, University of Electronic Science and Technology of China  
Jinhua Liu, University of Electronic Science and Technology of China

\* 4:50 PM – 5:10 PM

Research on Interaction and Coupling of Various Energy Flows in Micro Energy Internets

Siqi Yu, Tsinghua University  
Shuqing Zhang, Tsinghua University  
Yubo Sun, Tsinghua University  
Shaopu Tang, Tsinghua University

## **Regular Session: Energy Storage and Renewable Energy (Room II)**

*Tuesday, 18 April, 2017, 1:30 PM – 5:10 PM*

*Session Chair: Ziwei Hu, Global Energy Interconnection Research Institute*

\*1:30 PM – 1:50 PM

Operation management of a Hybrid Renewable Energy systems based on multi-objective optimal under uncertainties

Xiaokun Zheng, National University of Defense Technology  
Kaiwen Li, National University of Defense Technology  
Rui Wang, National University of Defense Technology  
Tao Zhang, National University of Defense Technology

\*1: 50 PM – 2:10 PM

Transient Frequency Response Model-based Energy Storage Optimum Size in Power Systems

Hua Ye, Chinese Academy of Sciences  
Yanan Tang, Chinese Academy of Sciences  
Yao Liu, Chinese Academy of Sciences  
Zekun Li, Chinese Academy of Sciences  
Zhiping Qi, Chinese Academy of Sciences

\*2:10 PM – 2:30 PM

Energy Storage Frequency Response Control Considering Battery Aging of Electric Vehicle

Huachun Han, State Grid Jiangsu Electric Power Company Research Institute  
Qiang Li, State Grid Jiangsu Electric Power Company Research Institute  
Zhenhua Lv, State Grid Jiangsu Electric Power Company Research Institute  
Xiong Yang, State Grid Jiangsu Electric Power Company Research Institute

\*2:30 PM – 2:50 PM

An Integrated Optimization Model of Charging Station/ Battery-Swap Station/ Energy Storage System Considering Uncertainty

Yiyi Wang, China Guodian Corporation  
Yuqing Yang, University of New South Wales  
Ning Zhang, State Grid Corporation of China

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Mei Huang, Beijing Jiaotong University

\*2:50 PM – 3:10 PM

Energy-Reserve Co-Optimization for Energy Internet Considering Reserve Control Zone Determination

Fan Liu, Xi'an Jiaotong University

Zhaohong Bie, Xi'an Jiaotong University

Can Wang, Xi'an Jiaotong University

Tao Ding, Xi'an Jiaotong University

BREAK

\*3:30 PM – 3:50 PM

Solar Power Prediction in Smart Grid Based on NWP Data and an Improved Boosting Method

Xinpei Sun, National University of Defense Technology

Tao Zhang, National University of Defense Technology

\*3:50 PM – 4:10 PM

Modeling and Control of New Wind Power Grid Connected System

Gangui Yan, Northeast Electric Power University

Jinhao Zhang, Northeast Electric Power University

Qi Jia, Northeast Electric Power University

Yonglin Li, Northeast Electric Power University

Yong Li, State grid of Minquan power supply company

\*4:10 PM – 4:30 PM

Unit Commitment for Systems with High Penetration of Wind Power

Na Zhang, State Grid Liaoning Electric Power Company Limited

Zhuoran Song, State Grid Liaoning Electric Power Company Limited

Xin He, State Grid Liaoning Electric Power Company Limited

Mingli Zhang, State Grid Liaoning Electric Power Company Limited

Jing Gao, State Grid Liaoning Electric Power Company Limited

Weidong Li, Dalian University of Technology

\*4:30 PM – 4:50 PM

Study on Stochastic SCUC Based BESS Planning Problem

Fanxing Meng, North China Electric Power University

Yingyun Sun, North China Electric Power University

\*4:50 PM – 5:10 PM

Multi-objective Optimization of Hybrid Renewable Energy System with Load Forecasting

Mengjun Ming, National University of Defense Technology

Rui Wang, National University of Defense Technology

Yabing Zha, National University of Defense Technology

Tao Zhang, National University of Defense Technology

*Wednesday Morning – April 19<sup>th</sup>, 2017*

**Workshop - Modelling, Control and Optimization of Energy Internet (Room I)**

*Wednesday, 19 April, 2017, 9:00 AM – 12:00 PM*

*Workshop Chair: Qiuye Sun, Northeastern University, China*

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## **Regular Session: Energy Routing & DC Microgrid (Room II)**

*Wednesday, 19 April, 2017, 9:00 AM – 12:00 PM*

*Session Chair: Yang Li, EPRI, State Grid, China; Guang Ren, Tsinghua University, China*

\*9:00 AM – 9:20 AM

Open System Interconnection for Energy: A Reference Model of Energy Internet

Yayun Zhu, North China Electric Power University

Jiye Wang, State Grid Cooperation of China

Kehe Wu, North China Electric Power University

\* 9:20 AM – 9:40 AM

An Open Energy Routing Network for Low-voltage Distribution Power Grid

Xinyang Han, State Grid Energy Research Institute

Fang Yang, State Grid Energy Research Institute

Cuifen Bai, State Grid Energy Research Institute

Guanglong Xie, State Grid Energy Research Institute

Guang Ren, Tsinghua University

Haochen Hua, Tsinghua University

Junwei Cao, Tsinghua University

\*9:40 AM – 10:00 AM

Research on Energy Switch Oriented Energy Internet

Zhiyuang Cai, Shenyang University of Technology

Yang Li, Shenyang University of Technology

Shaohua Ma, Shenyang University of Technology

Bing Yu, Beijing Jiaotong University

Hanyong Hao, State Grid Corporation of China

Yu Ji, China Electric Power Research Institute

Ming Wu, China Electric Power Research Institute

\*10:00 AM – 10:20 AM

Fault Characteristic Analysis and Simulation of Power Electronic Transformer Based on MMC in Distribution Network

Tingdong Zhou, North China Electric Power University

Yonghai Xu, North China Electric Power University

**BREAK**

\*10:40 AM – 11:00 AM

Research of Voltage Control Strategy for Power Management System in DC Microgrid

Mengchu Zhao, Tsinghua University

Qingguang Yu, Tsinghua University

\*11:00 AM – 11:20 AM

Research on Topology of DC Distribution Network Based on Power Flow Optimization

Yue Yi, Tsinghua University

Zhichang Yuan, Tsinghua University

Yirun Ji, Southeast University

\*11:20 AM – 11:40 AM

Bus Voltage Control Strategy for Low Voltage DC Microgrid Based on AC Power Grid and Battery

Zhongtian Zhao, Shandong University of Technology

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Jian Hu, Shandong University of Technology  
Hongtao Chen, Shandong University of Technology

\*11:40 AM – 12:00 AM

Operating Characteristic Analysis of AC/DC Microgrid under Energy Internet

Yu Ji, China Electrical Research Institute  
Ming Wu, China Electrical Research Institute  
Yang Li, China Electrical Research Institute  
Hongbin Wu, He Fei University of Technology

## Wednesday Afternoon – April 19<sup>th</sup>, 2017

### **Workshop - Modelling, Control and Optimization of Energy Internet (Room I)**

Wednesday, 19 April, 2017, 1:30 PM – 5:00 PM

Workshop Chair: Qiuye Sun, Northeastern University, China

### **Workshop - Energy Internet Demonstration Engineering and Applications (Room II)**

Wednesday, 19 April, 2017, 1:30 PM – 5:00 PM

Workshop Chair: Dunnan Liu, North China Electric Power University, China

## Thursday Morning – April 20<sup>th</sup>, 2017

### **Regular Session: Power System & Power Quality (Room I)**

Thursday, 20 April, 2017, 9:00 AM – 12:00 PM

Session Chair: Haochen Hua, Tsinghua University, China;

\*9:00 AM – 9:20 AM

An Online Method to Identify the Voltage Stability of Power Systems During Transients

Wei Zhang, Harbin Institute of Technology  
Zhaolin Liu, Harbin Institute of Technology  
Yulin Zhao, Harbin Institute of Technology

\*9:20 AM – 9:40 AM

Optimal Dispatch Modes of Tie Line and Early-Warning Strategy

Meng Xiang, State Grid Hunan Electric Power Corporation Research Institute  
Yuehui Chen, State Grid Hunan Electric Power Corporation  
Bin Zhang, State Grid Hunan Electric Power Corporation Research Institute  
Jian Zuo, State Grid Hunan Electric Power Corporation Research Institute  
Hu Guo, State Grid Hunan Electric Power Corporation Research Institute  
Dunnan Liu, North China Electric Power University

\*9:40 AM – 10:00 AM

New Control Scheme for Virtual Synchronous Generators of Different Capacities

Sara Yahia Altahir, North China Electric Power University  
Xiangwu Yan, North China Electric Power University  
Abuzaid Saeed Gadaalla, North China Electric Power University

\*10:00 AM – 10:20 AM

Novel Control of DFIG with Energy Storage Device to Enhance LVRT Capability and to Perform Voltage Support during Grid Faults

Yangwu Shen, State Grid Hunan Electric Power Institute  
Bin Zhang, State Grid Hunan Electric Power Institute



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Ting Cui, State Grid Hunan Electric Power Institute  
Jian Zuo, State Grid Hunan Electric Power Institute  
Feifan Shen, Wuhan University  
Deping Ke, Wuhan University

## BREAK

\* 10:40 AM – 11:00 AM

Research on Coordinated Control Strategy for Improving the Frequency and Voltage Quality of Power System Based on Adaptive Fuzzy Control Using Wind Power and Energy Storage

Chao Gao, Institute of Electrical Engineering, Chinese Academy of Sciences

Xisheng Tang, Institute of Electrical Engineering, Chinese Academy of Sciences

Li Kong, Institute of Electrical Engineering, Chinese Academy of Sciences

\*11:00 AM – 11:20 AM

Power Quality Disturbance Recognition Based on Fitting Redundant Lifting Wavelet Packet and Energy Analysis

Zijing Yang, Beijing Institute of Graphic Communication

Guang Ren, Tsinghua University

\*11:20 AM – 11:40 AM

Design and Performance Analysis of a MV DVR with Double-Stage LC filter

Shaojie Zhang, Tsinghua University

Jian Le, Wuhan University

\* 11:40 AM – 12:00 PM

Voltage Sag Classification with Consideration of Phase Shift

Pengfei Wei, State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources

Yonghai Xu, State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources

Qiaoqian Lan, Jiading Power Supply Company of State Grid Shanghai Municipal Electric Power Company

## **Regular Session: Energy Market, Trading and Information (Room II)**

*Thursday, 20 April, 2017, 9:00 AM – 12:00 PM*

*Session Chair: Kun Meng, Beijing Information Science & Technology University, China*

\* 09:00 AM – 09:20 AM

Power Trading Mode in Multi-microgrids with Controllable Distributed Generation: A Game-theoretic Approach

Shuangbo Li, National University of Defense Technology

Xiaokun Zheng, National University of Defense Technology

Tao Zhang, National University of Defense Technology

Yan Zhang, National University of Defense Technology

\*09:20 AM – 09:40 AM

Modeling on Electrical Power Market Clearing with Consideration of the Participation of VPP and MG in View of Energy Internet

Jiayi Hu, Shanghai Jiao Tong University

Yang Liu, Shanghai Jiao Tong University

Zheng Yan, Shanghai Jiao Tong University

Saiyi Wang, Pudong Power Supply Company

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Zhenghua Wu, Pudong Power Supply Company  
Yueshen Hua, Pudong Power Supply Company

\*09:40 AM – 10:00 AM

Democratic Centralism: A Hybrid Block Chain Architecture and its Applications in Energy Internet

Lijun Wu, Beijing Information Science and Technology University  
Kun Meng, Beijing Information Science and Technology University  
Shuo Xu, Beijing Information Science and Technology University  
Shuqin Li, Beijing Information Science and Technology University  
Meng Ding, Beijing Information Science and Technology University  
Yanfeng Suo, University of Science and Technology Beijing

\*10:00 AM – 10:20 AM

Cost-benefit Analysis Method for Optimizing Spinning Reserve Requirements with Consideration of Wind Power Generation Under Carbon Trading Environment

Liudong Zhang, State Grid Jiangsu Electric Power Company, Southeast University  
Yubo Yuan, State Grid Jiangsu Electric Power Company  
Bing Chen, State Grid Jiangsu Electric Power Company

BREAK

\*10:40 AM – 11:00 AM

An Uncertain Harmonic Power-Flow Algorithm Based on Cloud Model for Energy Internet

Yi Zhang, State Grid Fujian Electric Power Research Institute  
Jiye Wang, State Grid Corporation of China  
Guang Zhao, Xiamen Great Power Geo Information Technology Co. Ltd.

\*11:00 AM – 11:20 AM

Research on Fault Diagnosis of Power Equipment Based on Big Data

Baoshuai Wang, Huazhong University of Science and Technology  
Xia Xiao, Huazhong University of Science and Technology  
Yan Xu, Huazhong University of Science and Technology  
Yao Li, Huazhong University of Science and Technology

\*11:20 AM – 11:40 AM

Energy Management for Energy Internet: A Combination of Game Theory and Big Data-based Renewable Power Forecasting

Zhenyu Zhou, North China Electric Power University  
Fei Xiong, North China Electric Power University  
Chen Xu, North China Electric Power University  
Sheng Zhou, Tsinghua University  
Jie Gong, Sun Yat-sen University

\*11:40 AM – 12:00 PM

A Privacy Preserving Model for Energy Internet base on Differential Privacy

Hui Cao, Wuhan University  
Shubo Liu, Wuhan University  
Renfang Zhao, Wuhan University  
Haomin Gu, Anhui Jiyuan Software Co. LTD,  
Jie Bao, State Grid JiBei Electric Power Company  
Lin Zhu, State Grid JiBei Electric Power Company

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## Thursday Afternoon – April 20<sup>th</sup>, 2017

### **Workshop - Space Energy Internet & Energy Management (Room I)**

*Thursday, 20 April, 2017, 1:30 PM – 5:00 PM*

*Workshop Chair: Chunfeng Wang, Qian Xuesen Laboratory of Space Technology, China Aerospace Science and Technology Corporation, China; Fulu Li, Tsinghua University, China*

\*1:30 PM – 3:10 PM

Invited Talks

BREAK

\*3:30 PM – 3:50 PM

Energy Efficient Community Coding and Capacitive Sensing for Space Energy Internet

Fulu Li, Tsinghua University

Junwei Cao, Tsinghua University

Chunfeng Wang, China Academy of Space Technology

\*3:50 PM – 4:10 PM

Modelling and Simulation of Receiving System for Simultaneous Wireless Information and Power Transfer

Xutao Hou, Space Star Technology CO, LTD

Dong Yan, Southeast University

Chunfeng Wang, China Academy of Space Technology

Man Feng, Southeast University

Jiapeng Wu, Space Star Technology CO, LTD

\*4:10 PM – 4:30 PM

The Analysis for Selecting Compensating Capacitances of Two-Coil Resonant Wireless Power Transfer System

Huan Hong, Northeastern University

Dongsheng Yang, Northeastern University

Sokhui Won, Northeastern University

\*4:30 PM – 4:50 PM

Real-time Energy Management Optimization Using Model Predictive Control on a Microgrid Demonstrator

Pierre-Armand Jaboulay, Tsinghua University

Wanshan Zhu, Tsinghua University

Xinyan Niu, EDF China Holding

Xuyang Pan, EDF China Holding

Shiqiao Gao, EDF China Holding

\*4:50 PM – 5:10 PM

Optimal Energy Management Based on Users' Comfort Degree in a Microgrid

Wenping Zhang, Sun Yat-sen University

Yingliang Xu, Sun Yat-sen University

### **Workshop - Advanced Wireless Communication and Networking for Energy Internet (Room II)**

*Thursday, 20 April, 2017, 1:30 PM – 5:00 PM*

*Workshop Chair: Zhaoming Lu, Beijing University of Posts and Telecommunications, China*

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\*1:30 PM – 3:10 PM

Invited Talks

BREAK

\*3:30 PM – 3:50 PM

Linear Programming Based Energy Cooperation in Cellular Networks powered by Hybrid Energy

Dongxu Chang, Beijing University of Posts and Telecommunications  
Xiangming Wen, Beijing University of Posts and Telecommunications  
Yawen Chen, Beijing University of Posts and Telecommunications  
Zhaoming Lu, Beijing University of Posts and Telecommunications  
Hua Shao, Beijing University of Posts and Telecommunications

\*3:50 PM – 4:10 PM

Security Versus Reliability Analysis for Multi-Eavesdropper Cooperation Wireless Networks with Best Relay

Meiling Li, Taiyuan University of Science and Technology  
Zengshou Dong, Taiyuan University of Science and Technology  
Gangfei Wang, Taiyuan University of Science and Technology

\*4:10 PM – 4:30 PM

Research on Adaptability Evaluation Method of New Communication Technology Applied to Energy Internet Communication Network

Ziwei Hu, Global Energy Interconnection Research Institute  
Lifeng Lu, Global Energy Interconnection Research Institute  
Guojun Liu, Global Energy Interconnection Research Institute  
Jin Yi, State Grid Jiangsu Electric Power Company  
Liang Zhao, Beijing University of Posts and Telecommunications

\*4:30 PM – 4:50 PM

Research on Reliability of Distribution Network Based on Grid Cyber-Physical System and Telecontrol System

Yunfei Guo, Global Energy Interconnection Research Institute  
Shidong Liu, Global Energy Interconnection Research Institute  
Yun Liang, Global Energy Interconnection Research Institute  
Li Huang, Global Energy Interconnection Research Institute

\*4:50 PM – 5:10 PM

Dynamic QoS-driven Wireless Access Scheduling for Numerous Smart Devices in Energy Internet

Jinqian Cheng, Beijing University of Posts and Telecommunications  
Xiangming Wen, Beijing University of Posts and Telecommunications  
Zhaoming Lu, Beijing University of Posts and Telecommunications  
Chunlei Sun, Beijing University of Posts and Telecommunications  
Wenhao Shi, Beijing University of Posts and Telecommunications  
Xi Han, Beijing University of Posts and Telecommunications

*Thursday Evening – April 20<sup>th</sup>, 2017*

**Conference Dinner**

*Thursday, 20 April, 2017, 6:30 PM – 8:00 PM*

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## Friday Morning – April 21<sup>st</sup>, 2017

### **Workshop – Energy Internet Key Technologies and Business Models for Development of the First Round Demonstration Projects (Room I)**

*Friday, 21 April, 2017, 9:00 AM – 12:00 PM*

*Workshop Chair: Shouzhen Zhu, Tsinghua University, China*

*Organizer: China Smart Power Technology Alliance & Beijing Smart China Energy Internet Research Institute*

### **Regular Session: Demand Side Management and Response (Room II)**

*Friday, 21 April, 2017, 9:00 AM – 12:00 PM*

*Session Chair: Raman Paranjape, University of Regina, Canada; Haochen Hua, Tsinghua University, China*

\*9:00 AM – 9:20 AM

A Distributed Optimal Load Control Model for Heterogeneous Homes Responding to Time of Use

Zhanle Wang, University of Regina

Raman Paranjape, University of Regina

\*9:20 AM – 9:40 AM

Research on Estimation Method of the Balance Density of Electric Vehicles Charging Points

Bo He, State Grid Energy Research Institute

Yushuo Hou, North China Electric Power University

\*9:40 AM – 10:00 AM

Real-Time Decision Making Model for Thermostatically Controlled Load Aggregators by Natural Aggregation Algorithm

Chenxi Li, The University of Sydney

Yingying Chen, The University of Sydney

Fengji Luo, The University of Sydney

Zhao Xu, The Hong Kong Polytechnic University

Yu Zheng, Southern China Power Grid Research Institute

\*10:00 AM – 10:20 AM

Non-intrusive Load Monitoring and Identification Based on Maximum Likelihood Method

Liang Kong, Northeastern University

Dongsheng Yang, Northeastern University

Yanhong Luo, Northeastern University

BREAK

\*10:40 AM – 11:00 AM

Rough Neuron based RBF Neural Networks for Short-Term Load Forecasting

Tengfei Zhang, Nanjing University of Posts and Telecommunications, Jiangsu Engineering Laboratory of Big Data Analysis and Control for active distribution network

Dan Liu, Nanjing University of Posts and Telecommunications,

Dong Yue, Nanjing University of Posts and Telecommunications, Jiangsu Engineering Laboratory of Big Data Analysis and Control for active distribution network

\*11:00 AM – 11:20 AM

Short Term Load Forecasting Based on IGSA- ELM Algorithm

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Wanlu Zhang, Tsinghua University  
Haochen Hua, Tsinghua University  
Junwei Cao, Tsinghua University

\*11:20 AM – 11:40 AM

Analysis and Design of a High Performance Voltage Control Strategy for V2G system

Huachun Han, State Grid Jiangsu Electric Power Company Research Institute  
Zhenhua Lv, State Grid Jiangsu Electric Power Company Research Institute  
Qiang Li, State Grid Jiangsu Electric Power Company Research Institute  
Di Huang, State Grid Jiangsu Electric Power Company Research Institute

\*11:40 AM – 12:00 PM

A Novel Two-stage Unit Commitment Model Incorporating Demand Response for the Integration of Wind Power

Ning Zhang, State Grid Corporation of China  
Yiyi Wang, China Guodian Corporation  
Zhaoguang Hu, China Electricity Council  
Yanan Qiao, RWTH Aachen University

*Friday Afternoon – April 21<sup>st</sup>, 2017*

**Workshop – Energy Internet Key Technologies and Business Models for Development of the First Round Demonstration Projects (Room I)**

*Friday, 21 April, 2017, 1:30 PM – 5:00 PM*

*Workshop Chair: Shouzhen Zhu, Tsinghua University, China*

*Organizer: China Smart Power Technology Alliance & Beijing Smart China Energy Internet Research Institute*