

## Dr. FENG Donghan

### Current Contact Information

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## Education

Ph.D (ZJU 08), B.Eng (ZJU 03), all major in electric power engineering

Ph.D thesis: Supplier Strategies and Associated Risks in a Deregulated Electric Power Industry

B.Eng thesis: Transmission Expansion Planning of Lishui Electric Power System

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## Academic Experience

- 2009.8 --- Hans Christian Ørsted Research Fellow, Centre for Electric Technology (CET), Electro Department, Technical University of Denmark (DTU)  
<http://www.elektro.dtu.dk/English/Service/Phonebook.aspx?lg=showcommon&id=57007&type=person>
- 2008.6 --- Assistant Professor, Department of Electrical Engineering, Shanghai Jiao Tong University (SJTU), Shanghai, China  
[http://cc.sjtu.edu.cn/Able.Acc2.Web/Page\\_TeachersDetail.aspx?ID=100430](http://cc.sjtu.edu.cn/Able.Acc2.Web/Page_TeachersDetail.aspx?ID=100430)
- 2006.3 --- 2007.11 Visiting Scholar, Center for Electrical Energy Systems (CEES), Department of Electrical and Electronic Engineering (EEE), University of Hong Kong (HKU), Hong Kong, <http://www.eee.hku.hk/~cees/people/scholar.htm>
- 2005.3 --- 2006.3 Research Assistant, National Key Laboratory of Power Systems, Tsinghua University (THU), China, <http://www.sz.tsinghua.edu.cn/index.jsp>
- 2003.9 --- 2008.6 Graduate Assistant, School of Electrical Engineering, Zhejiang University (ZJU), China, <http://ee.zju.edu.cn/>
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## Research Projects

- “The FlexPower project – market solution activating electricity demand and small scale generation as regulating power”, collaborator: DTU (CET, Risø, Informatics), Actua, Eurisco, Enfor, EC Power, SEAS/NVE, Ea Energy Analyses, 2010-2012.  
Donghan was responsible for the design of the proposed market solution.
- “The EDISON project - Electric vehicles in a Distributed and Integrated market using Sustainable energy and Open Networks”, collaborator: Danish Energy Association, DTU (CET, Risø, Informatics), IBM, Siemens, Oestkraft, Dong Energy, Eurisco, 2009-2012  
Donghan was responsible for the analysis of EV integration potentials and market design.
- “Application research of wind farm injection”, National High Technology Research and Development Program of China (863 Program), sponsor: Ministry of Science and Technology (China), 2008-2010  
Donghan was responsible for the impact evaluation to power system.
- “Transmission Right Trading Mechanism for East China Electricity Market”, sponsor: East China

Power Corporation, 2008

Donghan completed the final report and presentation.

- “Capacity Market Consultation for East China Power System”, sponsor: East China Power Corporation, 2008  
Donghan completed the major tasks and the final report.
- “General Organization Design for China Power Industry”, sponsor: State Grid Corporation of China (SGCC), 2007  
Donghan completed the investigation report for the electricity market design in Australia, Germany, France and Brazil
- “Transmission Congestion Management for Northeast Power System”, sponsor: Northeast Power Company, 2005-2006  
Donghan completed the modeling the 843 buses Northeast China Electric Power System, the compiling, debugging and simulation of the congestion management program (MatLab) with the Northeast China Electric Power System
- “Decision support system for East China Power Market”, sponsor: Zhejiang Grid Company, 2005-2006  
Donghan developed a practical technique for risk management and portfolio construction of power companies
- “Electric ancillary services”, Grant HKU7201/05E, sponsor: Research Grand Council of Hong Kong, 2005-2007  
Donghan developed a new technique for measuring market power in reactive supplier and tested the proposed approach on the Nordic system and the IEEE118 system
- “The Construction of Electricity markets”, (a series of books, in Chinese) sponsor: The State Electricity Regulatory Commission (SERC), 2004-2005  
Donghan completed the chapter “New York State Electricity Market”, and helped to organize and revise the PJM chapter and New England chapter.

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## Teaching and Presentation

- Presenter, “Risk Analysis of Volume Cheat Strategy in a Competitive Capacity Market”, Paper Session: bidding strategies & risk management, IEEE Power Engineering Society General Meeting, 26-30 July 2009, Calgary, Canada.
- Presenter, “Supplier Multi-trading Strategy: A Stochastic Programming Approach”, Paper Session: forward and capacity markets and contracts, IEEE Power Engineering Society General Meeting, 20-24 July 2008, Pittsburgh, PA, USA.
- Presenter, “A Discriminative Bid-Cap Setting Method for Ex Ante Market Power Regulation”, Paper Session: market operations issues and methods, IEEE Power Engineering Society General Meeting, 24-28 June 2007, Tampa, FL, USA.
- Lecturer, “Electricity markets and Optimal Operation of Electric Power Systems”, SJTU graduate course No.EE412, semester 2009, 2010, School of Electronic, Information and Electrical Engineering, Shanghai Jiao Tong University. Include curriculum design, textbook and experiments
- Co-Lecturer, “Electricity markets and Energy Economics”, graduate course, ZJU winter semester 2004, School of Electrical Engineering, Zhejiang University. Include curriculum design, co-authoring the textbook, organizing experiments (simulated auctions of electricity market under different scenarios)
- Co-Lecturer, “Electricity markets”, undergraduate course, winter semester 2004, School of

Electrical Engineering, Zhejiang University. Include curriculum design, preparing the course materials.

- Co-Supervisor, 3 PhD theses and 2 MPhil theses

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## Prizes and Awards

2009	Hans Christened Ørsted Award (Technical Univ. of Denmark)
2007	Excellent Graduate Student Scholarship (Zhejiang Univ.)
2007	Hua-Long Science Scholarship (Zhejiang Univ.)
2006	Guang-Hua Scholarship (Zhejiang Univ.)
2006	Excellent Graduate Student Scholarship (Zhejiang Univ.)
2006	Academic Paper Prize, "Pricing Mechanism for Electricity Market", (Chinese Academy of Social Science)
2005	Bronze medal, Interscholastic English Speech Contest (between Peking Univ., Tsinghua Univ., Nankai Univ. and Harbin Institute of Technology)
2003	Gold medal, Dedication for the launch of Shenzhou-V Spaceship (Zhejiang Univ.)
2003	Bronze medal, Creativity Contest for Dormitory Culture (Zhejiang Univ.)
2003	Outstanding (Bachelor) Diplomatic Design (Zhejiang Univ.)
2001	Outstanding Merit Award (Zhejiang Univ.)
2001	Excellent Undergraduate Student Scholarship (Zhejiang Univ.)
2000	Social activity Award (Zhejiang Univ.)

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## Background Summary

Donghan has been with the faculty of Shanghai Jiao Tong University (SJTU) since 2008. He worked at University of Hong Kong (HKU) as a visiting scholar during 2006-2007 and worked at Tsinghua University (THU) as a graduate research assistant during 2005-2006. He received his B.Sc. and Ph.D. degree in the department of electrical engineering from Department of Electrical Engineering, Zhejiang University (ZJU) in 2003 and 2008, respectively. Since 2009, he has been granted the Hans Christan Ørsted Award for research with the Centre for Electric Technology, Technical University of Denmark (DTU). His research interests are engineering, economic and environmental issues in deregulated electric power industry.

Donghan appreciate his supervisors, advisors and colleagues Prof. Deqiang Gan of Zhejiang University, Dr. Jin Zhong and Prof. Felix Wu of University of Hong Kong, Prof. Yixin Ni of Tsinghua University, Prof. Zheng Yan of Shanghai Jiao Tong University, Dr. Zhao Xu and Prof. Jacob Østergaard of Technical University of Denmark for their priceless advice, comments and guidance on his research work.

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## Research & Teaching Plans

- 2010-2014 research focus: (1) next-generation system operation and ancillary services reorganization within a smart grid, under the environment of increasing renewable energy integration; (2) retail electricity market theory and active distribution network infrastructure, for a portfolio of different DR/DER/DS (demand-side/ distributed-energy resources/ distributed storage) technologies.
- 2010-2014 teaching focus: Improve the Course "Electricity market basics - modeling, design & global experience" to a world class level. Including the translation and revision of the current

textbook (“Energy Economics and Electricity Markets”, China Machine Press, ISBN: 978-7-111-29753-6) into English, tentative title "Electricity market basics - modeling, design & global experience".

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## Selected Publications

- [1] **D. Feng**, J. Zhong, D. Gan, “Reactive Market Power Analysis Using Must-Run Indices”, *IEEE Trans. Power Systems*, vol. 23, no. 2, pp. 755 – 765, May 2008.
- [2] **D. Feng**, D. Gan, J. Zhong, Y. Ni, “Supplier asset allocation in a pool-based electricity market”, *IEEE Trans. Power Systems*, vol. 22, no. 3, pp. 1129-1138, August 2007.
- [3] **D. Feng**, Z. Yan, J. Østergaard, Z. Xu, D. Gan, J. Zhong, N. Zhang, T. Dai, “Simulation embedded Artificial Intelligence Search Method for Supplier Trading Portfolio Decision”, *IET Generation, Transmission & Distribution*, vol.4, no.2, pp. 221 – 230, February 2010.
- [4] **D. Feng**, J. Zhong, D. Gan, Z. Yan, “A Discriminative Offer-Cap Setting Method for Ex Ante Market Power Regulation”, *IEEE Trans. Power Systems*, major revision in review.
- [5] **D. Feng**, Z. Xu, J. Zhong, J. Østergaard, “Analytical Resolution for Dual Degeneracy by Extension of Spot Pricing”, *IEEE Trans. Power Systems*, in review.
- [6] **D. Feng**, P. Nyeng, J. Østergaard, J. Zhong, “New real-time market facilitating demand-side resources for system balancing” , *IEEE Trans. Industrial Electronics*, in review.
- [7] **D. Feng**, J. Østergaard, “Redesigning the market operation timeline to ensure resource adequacy for system balancing”, plan to submit to *IEEE Trans. Power Systems*, in peer review.
- [8] **D. Feng**, D. Gan, J. Zhong, Y. Ni, “Efficient frontier analysis for the GenCo multi-trading strategy: Part two Algorithm design”, *Automation of Electric Power Systems*, v 31, n 14, Jul 25, 2007, p 31-37.
- [9] **D. Feng**, D. Gan, J. Zhong, Y. Ni, “Efficient frontier analysis for the GenCo multi-trading strategy: Part one Model analysis”, *Automation of Electric Power Systems*, v 31, n 13, Jul 10, 2007, p 29-35.
- [10] **D. Feng**, D. Gan, J. Zhong, Y. Ni, “Pricing when market optimization has multiple dual solutions”, *Automation of Electric Power Systems*, v 30, n 12, Jul 25, 2006, p 27-32.
- [11] **D. Feng**, D. Gan, “Research on capital allocation of power producer”, *Automation of Electric Power Systems*, v 29, n 24, Dec 25, 2005, p 14-20.
- [12] **D. Feng**, J. Østergaard, M. Togby, Z. Xu, “Redesign Electricity Market for the Next Generation Power System of Renewable Energy and Distributed Storage Techniques”, IEEE Power Engineering Society General Meeting, 26-30 July 2010, accepted.
- [13] **D. Feng**, Z. Xu, “Risk Analysis of Volume Cheat Strategy in a Competitive Capacity Market”, IEEE Power Engineering Society General Meeting, 26-30 July 2009, Calgary.
- [14] **D. Feng**, J. Zhong, D. Gan, “Supplier Multi-trading Strategy: A Stochastic Programming Approach”, IEEE Power Engineering Society General Meeting, 20-24 July 2008, p 1-6.
- [15] **D. Feng**, J. Zhong, D. Gan, “A Discriminative Bid-Cap Setting Method for Ex Ante Market Power Regulation”, IEEE Power Engineering Society General Meeting, 24-28 June 2007, p 1-6.
- [16] W. Jiang, Z. Yan, **D. Feng**, “A review on reliability assessment for wind power”, *Renewable and Sustainable Energy Reviews*, v 13, n 9, p 2485-2494, December 2009.
- [17] J. Xie, X. Bai, **D. Feng**, D. Gan, “Peaking cost compensation in Northwest China Power System”, *European Tran. Electrical Power*, v 19, n 7, p 1016-1032, October 2009.
- [18] J. Yang, Z. Yan, **D. Feng**, “Equilibrium model for integrated energy-reserve electricity market with regional reserve constraints”, *Automation of Electric Power Systems*, v 33, n 11, p 13-17, June 10, 2009.

- [19] J. Yang, Z. Yan, **D. Feng**, Y. Hua, “Analysis of the bidding strategy in the hybrid transmission right market based on the conjectured price function”, *Automation of Electric Power Systems*, v 33, n 10, p 24-28, May 25, 2009.
- [20] L. Yang, X. Zhuang, J. Chen, N. Zhang, T. Dai, J. Ye, **D. Feng**, D. Gan, “Empirical comparison on monthly purchasing models for East China Regional Market”, *Automation of Electric Power Systems*, v 31, n 9, May 10, 2007, p 21-25.
- [21] L. Yang, S. Bao, H. Lu, **D. Feng**, D. Gan, “Utility company risk management and generator must run capacity”, *Automation of Electric Power Systems*, v 28, n 21, Nov 2004, p 1-5.
- [22] J. Yang, Z. Yan, **D. Feng**, “An Oligopolistic Model Considering the Locational SR Requirement for Joint Energy-Reserve Market”, *European Tran. Electrical Power*, accepted.
- [23] J. Yang, Z. Yan, **D. Feng**, “The Analysis of Pumped Storage GenCo Bidding Strategies in an Oligopolistic Power Market”, *IEEE Trans. Power Systems*, major revision in review.
- [24] D. Gan, L. Yang, **D. Feng**, “*Economics and Electricity Markets*”, China Machine Press, ISBN: 978-7-111-29753-6, March 2010, 1st edition.