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From 1999 to 2007, Dr Chang taught Resource and Energy Economics, Environmental Economics, Macroeconomics, Principles of Economics, and Economics of the Environment at the National University of Singapore. He has published research papers in academic journals like *Econometric Theory*, *Economics Letters*, *Energy Policy*, *International Journal of Global Energy Issues*, and *International Journal of Electronic Business Management*. Apart from academic publications, he carried out consultation projects for the public and private sector including analysis of the effectiveness of new market structure in electricity industry, understanding the drivers for ethanol demand and the cost-benefit analysis of the Kyoto Protocol for Singapore. He also worked for international academic associations such as the International Association for Energy Economics (IAEE) as a member of the organizing committee for its annual conferences and a judge for best student paper competition for the IAEE conference. He was a degree fellow at the East-West Center, Hawaii and received his Ph.D. (in Economics) from University of Hawaii at Manoa, U.S.A

Published Papers:

1. "Electricity market deregulation and energy security: A study of the UK and Singapore electricity markets," with Jian Liang Lee, <i>International Journal of Global Energy Issues</i> 29(1/2): 109-132 (2008).	energy
2. "Efficiency of generation companies in the deregulated electricity market of Singapore: Parametric and non-parametric approaches," with Wai Lit Toh, <i>International Journal of Electronic Business Management</i> 5(3): 225-238 (2007).	energy
3. "Differing perspectives of major oil firms on future energy developments: An illustrative framework," with Jiayun Yong, <i>Energy Policy</i> 35(11): 5466-5480 (2007).	energy
4. "Electricity market structure, electricity price and its volatility" with Cheolbeom Park, <i>Economics Letters</i> , 95(2): 192-197 (2007).	energy
5. "The new electricity market of Singapore: Regulatory framework, market power and competition," <i>Energy Policy</i> , 35(1): 403-412 (2007).	energy
6. "Efficiency and deregulation of the electricity market in Singapore," with Tuan Hin Tay, <i>Energy Policy</i> , 34(16): 2498-2508 (2006).	energy
7. "Oil price fluctuations and the Singapore economy," with Joon Fong Wong, <i>Energy Policy</i> , 31(11): 1151-1165 (2003).	energy
8. "Economy, energy, and environment: A general-equilibrium model of	Energy,

heterogeneous demand and extraction in natural resources,” <i>Environmental and Resource Economics Review</i> , 6: 193-210 (1997).	environment
9. “The asymptotic variance of ML estimator of MA (1) coefficient – Solution,” with Eric Im, <i>Econometric Theory</i> , 9: 527-530 (1993).	energy
10. “The asymptotic variance of ML estimator of MA (1) coefficient,” with Eric Im, <i>Econometric Theory</i> , 8: 424-426 (1992).	energy

Papers in Conference Proceedings:

1. “R&D, energy policy and sustainable growth,” in <i>Developing & Delivering Affordable Energy in the 21st Century</i> , Proceedings of the 27 th USAEE/IAEE North American Conference, 16 – 19 September 2007, Houston, Texas, USA.	energy
2. “Pan-Asian gas trade model in competitive market frameworks,” with T. Pan in <i>Energy in a World of Changing Costs and Technologies</i> , Proceedings of the 26 th USAEE/IAEE North American Conference , 24 – 27 September 2006, Ann Arbor, Michigan, USA.	energy
3. “High crude oil prices: A study of midstream and downstream demand influence on prices,” with Y. Sng in <i>Securing Energy in Insecure Times</i> , Proceedings of the 29 th Annual IAEE International Conference, 7 – 10 June 2006, Potsdam, Germany.	Energy, oil
4. “Pricing behavior, market power and vesting contracts in a deregulated electricity market,” in <i>Fueling the Future: Prices, Productivity, Policies, and Prophecies</i> , Proceedings of the 25 th USAEE/IAEE North American Conference, 18 – 21 September 2005, Denver, Colorado, USA.	energy
5. “The new electricity market of Singapore: Regulatory framework, market power and competition,” in <i>Globalization of Energy: Markets, Technology, and Sustainability</i> , Proceedings of the 28 th Annual IAEE International Conference, 3 – 6 June 2005, Taipei, Republic of China.	energy
6. “Competition and market efficiency in deregulated electricity markets,” in <i>ASEAN Economic Cooperation: New Dynamics, New Paradigms</i> , Proceedings of the 29 th Conference of the Federation of ASEAN Economic Associations (FAEA), 10 – 11 December 2004, Kuala Lumpur, Malaysia.	energy
7. “Measuring consumption efficiency of the deregulated electricity market in Singapore,” Proceedings of the 9 th Convention of the East Asian Economic Association (EAEA), 13 – 14 November 2004, Hong Kong, China.	energy
8. “Price responsiveness of the deregulated electricity market of Singapore,” with T. Tay in <i>Energy, Environment and Economics in a New Era</i> , Proceedings of the 24 th USAEE/ IAEE North American	energy

Conference, 8 – 10 July 2004, Washington, DC, USA.	
9. “Singapore’s role in sustaining energy security in Asia,” with S. Tsai in <i>Energy, Environment and Economics in a New Era</i> , Proceedings of the 24 th USAEE/ IAEE North American Conference, 8 – 10 July 2004, Washington, DC, USA.	Energy, environment
10. “Price responsiveness in the new electricity market: A Singapore experience,” with T. Tay, <i>Proceedings of the IEEE 2nd International Conference on Electric Utility Deregulation, Restructuring and Power Technologies</i> (DRPT 2004), 5-8 April 2004, Hong Kong, China.	energy
11. “Regulatory framework of the Singapore new electricity market,” <i>Proceedings of the International Conference on Electric Industry in Transition: Issues and Prospects for Asia</i> , 14-16 January 2004, Asian Institute of Technology, Thailand.	energy
12. “Efficiency and equity in a deregulated electricity market,” in <i>New Challenges for Energy Decision Makers</i> , Proceedings of the 26 th International Association for Energy Economics (IAEE) International Conference, 4 – 7 June 2003, Prague, Czech Republic.	energy
13. “Oil price fluctuations and Chinese economy,” with C. Jiang in <i>Innovation and Maturity in Energy Markets: Experience and Prospects</i> , Proceedings of the 25 th International Association for Energy Economics (IAEE) International Conference, 26 – 29 June 2002, Aberdeen, Scotland, United Kingdom.	Energy, oil
14. “Price and load volatility in electricity spot market,” with D. Lee in <i>Innovation and Maturity in Energy Markets: Experience and Prospects</i> , Proceedings of the 25 th International Association for Energy Economics (IAEE) International Conference, 26 – 29 June 2002, Aberdeen, Scotland, United Kingdom.	Energy
15. “Reducing CO ₂ emissions: Perspective from two-sector energy model,” with J. Roumasset in <i>Energy Markets and the New Millennium: Economics, Environment, and Security of Supply</i> , Proceedings of the 23 rd International Association for Energy Economics (IAEE) International Conference, 7 – 10 June 2000, Sydney, Australia.	Energy, climate change

Books:

1. <i>Feasibility Study on Establishing of Oil Product Spot Market in Northeast Asia</i> , with Jin Young So (Lead Author), Nam Jin Roh and Hyun Jin An, Korea Energy Economics Institute, December 2007 (in Korean with Executive Summary in English)	energy
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Book Chapters:

1. "Singapore: National energy security and regional cooperation," with L. Lye, in <i>Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment</i> , ed. by B. Barton, C. Redgwell, A. Ronne and D. Zillman. Oxford: Oxford University Press, (2004).	Energy
2. "Equity, efficiency and effectiveness of greenhouse gas emissions reduction paradigms: Agenda for advanced developing economies (focus in Korea)," in <i>Reinforcing Asia-Europe Cooperation on Climate Change</i> , ed. by Asia-Europe Environment Forum, Asia-Europe Foundation, (2004).	Energy, climate change
3. "Overview of energy security in Asia," in <i>Energy & Security: The Geopolitics of Energy in the Asia-Pacific</i> edited by the Institute of Defence and Strategic Studies (IDSS), Nanyang Technological University (2006).	Energy
4. "Country studies: South Korea," in <i>Energy & Security: The Geopolitics of Energy in the Asia-Pacific</i> edited by the Institute of Defence and Strategic Studies (IDSS), Nanyang Technological University (2006).	Energy
5. "Renewable energy and the environment: Technology and economic perspectives," in <i>Energy Perspectives on Singapore and the Region</i> edited by Mark Hong, Institute of Southeast Asian Studies (2007).	Energy, climate change, environment
6. "East Asian energy supply and demand outlook" with Elspeth Thomson in <i>Asian Energy Security</i> (tentative) edited by East Asian Institute, NUS, National University of Singapore Press (forthcoming).	Energy
7. "The potential for energy conservation in East Asia" with Elspeth Thomson in <i>Asian Energy Security</i> (tentative) edited by East Asian Institute, NUS, National University of Singapore (forthcoming).	Energy

Reports from Consultancy:

1. " <i>The economics of the Kyoto Protocol: A cost-benefit analysis for Singapore</i> ," Prepared for Inter-Agency Task Force on Kyoto Protocol, October 2005 (working as an overall team leader with Ho Hiang Kwee, Leong Kai Choong, Ramli Osman, Toh Kok Chuan, Chen Yuan and Ramachandran Kannan)	Energy, climate change
2. " <i>Understanding methanol consumption drivers</i> ," Prepared for International Methanol Producers and Consumers Association (IMPCA), August 2005 (with Methanol Market Services Asia Pte. Ltd.)	Energy
3. " <i>The effectiveness of the new electricity market structure in Singapore</i> ," Prepared for Temasek Holdings, Singapore, August 2004.	Energy

Conference Papers:

1. "Is an integrated regional energy market a way to ensure energy security?" at the Second Meeting of the CSCAP Study Group on Asia Pacific Cooperation for Energy Security, 14-15 September, Goa, India.	Energy
2. "The prospects for an integrated regional energy market," at a Study Group on Energy Security Meeting hosted by CSCAP Singapore co-chairing with CSCAP-India, 23-24 April 2007, Traders Hotel, Singapore.	Energy
3. "Consumption efficiency and deregulated electricity market," with Q. Ong, <i>the 9th USAEE/IAEE/Allied Social Sciences Associations (ASSA) Annual Conference</i> , Chicago, USA, 5 – 7 January 2007.	Energy
4. "Issue linkage and multilateral environmental agreements," with Ruchika Saluja, <i>International Workshop on the Legal Issues for Clean Energy and Climate Change</i> , Tsinghua University, Beijing, China, 21 – 22 October 2006.	Energy, environment
5. "Energy and environmental protection: Role of renewable energy," <i>International Symposium on Energy Security: China and the World</i> , organized by China Institute for International Strategic Studies (CIISS), Beijing, China, 24 -26 May 2006.	Energy, environment
6. "Pricing behavior, market power and vesting contracts in a deregulated electricity market," <i>the 8th USAEE/IAEE/Allied Social Sciences Associations (ASSA) Annual Conference</i> , Boston, USA, 5 – 8 January 2006.	Energy
7. "Competition and market efficiency in a deregulated electricity market," <i>Workshops at the Allied Social Sciences Associations/Korea-America Economic Association (ASSA/KAEA) Annual Conference</i> , Philadelphia, USA, 6 – 9 January 2005.	Energy
8. "Market power and competition in a deregulated electricity market," <i>Joint Workshop between Department of Economics, National University of Singapore and Faculty of Economics, Chulalongkorn University</i> , Bangkok, Thailand, 3 December 2004.	Energy
9. "Equity, efficiency and effectiveness of greenhouse gas emissions reduction paradigms: Agenda for advanced developing economies," <i>the Asia-Europe Environment Forum 2nd Roundtable: "Reinforcing Asia-Europe Cooperation on Climate Change"</i> , 25-26 March 2004, Jeju, South Korea.	Energy, climate change
10. "Deregulation, competition and efficiency in the National Electricity Market in Singapore (NEMS)," <i>PPP Conference 2004: Regulation, Deregulation and Re-regulation in Globalizing Asia</i> , 22-23 March 2004, Singapore	Energy
11. "Price responsiveness in the new electricity market: A Singapore experience," with T. Tay, <i>the Korea-America Economic Association (KAEA) Annual Meeting, Allied Social Science Associations (ASSA) Annual Meetings</i> , 3 - 5 January 2004, San Diego, CA, USA.	Energy

<p>12. “Globalization and electricity market reforms in Singapore and Korea: Is wind still blowing?” <i>Global Challenges and Local Responses</i>, a workshop organized by Faculty of Arts and Social Sciences, National University of Singapore, 11-12 October 2003, NUS, Singapore.</p>	<p>Energy</p>
<p>13. “Efficiency and deregulation of the electricity market in Singapore,” with T. Tay, <i>International Conference on “Energy Market Reforms: Issues and Problems”</i> (2nd Asia Energy Conference), 25 – 26 August 2003, Hong Kong Baptist University, Hong Kong, China.</p>	<p>Energy</p>
<p>14. “Economic growth and the environmental quality,” with A. Chong, <i>the 7th PRSCO Summer Institute/The4th IRSA International Conference</i>, 20-21 June 2002, Bali, Indonesia.</p>	<p>Energy, environment</p>
<p>15. “Energy policy in Singapore: Efficiency, equity, and sustainability,” <i>Joint-Workshop Between the Department of Economics, National University of Singapore and the School of Economics, University of Nottingham</i>, 12 - 13 April 2002, Singapore.</p>	<p>Energy</p>
<p>16. “Poverty, energy, and economic growth in Singapore,” with J. Wong, <i>the 26th Federation of ASEAN Economic Association (FAEA) Annual Conference</i>, 20-21 December 2001, Bangkok, Thailand.</p>	<p>Energy, poverty</p>