

Electrical and Computer Engineering (ECpE) Work by L. Tesfatsion

<https://www2.econ.iastate.edu/tesfatsi/ECpEWork.LTesfatsion.pdf>

CONTENTS: ITD Project Site, Books/Monographs, IEEE Journal Pubs, Non-IEEE Journal Pubs, FERC/National Lab Reports, Conference Papers/Talks, Open-Source Software (OSS) Releases

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ITD PROJECT SITE:

Integrated Transmission and Distribution (ITD) Project: ISU Homepage

<https://www2.econ.iastate.edu/tesfatsi/ITDProjectHome.htm>

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Steve Widergren, Koen Kok, and Leigh Tesfatsion (2016), "**Transactive Energy Systems,**" presentation (webinar), *IEEE Smart Grid*, March 10.

Koen Kok (co-presenter), Steve Widergren (co-presenter), and Leigh Tesfatsion (co-presenter) (2015), "**Intelligent Systems Support for Transactive Energy Systems: The Fundamentals,**" presentation (webinar), Half-Day Tutorial, *IEEE PES GM*, Denver, CO, July 26-30.

Leigh Tesfatsion (presenter) and Deung-Yong Heo (2015), "**Facilitating Appropriate Compensation of Electric Energy and Reserve Through Standardized Contracts with Swing,**" presentation, *IEEE PES GM*, Denver, CO, July 26-30.

Auswin Thomas (presenter) and Leigh Tesfatsion (2015), "**Integrated Transmission and Distribution Effects of Demand-Side Participation,**" presentation, *IEEE PES GM*, Denver, CO, July 26-30.

Auswin Thomas (presenter) and Leigh Tesfatsion (2015), "**Agent-Based Test Beds for the Integrated Study of Transmission-Distribution Operations,**" presentation, *Transactive Energy Challenge Preparatory Workshop*, NIST, Gaithersburg, Maryland, March 24-25.

Wanning Li (presenter), Dheepak Krishnamurthy, and Leigh Tesfatsion (2015), "**Systematic Testing and Comparison of Deterministic and Stochastic Unit Commitment in an 8-Zone Test Case Based on ISO New England Data,**" presentation, *Innovative Smart Grid Technologies (ISGT) Conf*, Wash, D.C., Feb. 17-20.

Auswin Thomas (presenter) and Leigh Tesfatsion (2014), "**Agent-Based Test Beds for the Integrated Study of Transmission-Distribution Systems,**" presentation, *Transactive Energy Conference*, World Trade Center, Portland, Oregon, Dec 10-11.

Auswin Thomas (presenter) and Leigh Tesfatsion (2014), "**An Agent-Based Test Bed for Integrated Retail and Wholesale Power System Operations,**" presentation, *ISU-TNO Webinar*, October 17.

Leigh Tesfatsion (2014), "**A Framework for Flexible Contracts in Wholesale Power Markets,**" presentation, *GridWise Architecture Council Meeting & Workshop*, California Independent System Operator (CAISO), Folsom, CA, September 10-11.

Leigh Tesfatsion and Auswin Thomas (presenter) (2014), **“Adventures in Agent-Based HPC Test Bed Development for Electric Power Markets,”** presentation, *IEEE PES GM*, Washington, D.C., July 27-31.

Leigh Tesfatsion (presenter) and Deung-Yong Heo (2014), **“Facilitating Appropriate Compensation of Electric Energy and Reserve Through Standardized Contracts with Swing,”** presentation, *FERC Technical Conference on Increasing Real-Time and Day-Ahead Market Efficiency Through Improved Software*, U.S. Federal Energy Regulatory Commission (FERC), Washington, D.C., June 23-25.

Auswin G. Thomas (presenter), Dheepak Krishnamurthy, Leigh Tesfatsion, and Sean Mooney (2013), **“Multi-Agent System Capabilities of the AMES Wholesale Power Market Test Bed,”** presentation, *IEEE PES GM*, Vancouver, Canada, July 21-25.

Auswin G. Thomas (presenter), Leigh Tesfatsion, and Dionysios C. Aliprantis (2013), **“Integrated Retail and Wholesale Power Market Operations,”** presentation, *IEEE PES GM*, Vancouver, Canada, July 21-25.

Auswin G. Thomas (presenter), Leigh Tesfatsion, and Dionysios C. Aliprantis (2013), **“Impacts of Residential A/C Demand Response on Wholesale Power Markets,”** presentation, *IEEE PES GM*, Vancouver, Canada, July 21-25.

Dheepak Krishnamurthy (presenter), Wanning Li, and Leigh Tesfatsion (2013), **“A Small-Scale Test System for Wholesale Electric Power Market Operations Based on ISO-NE Data,”** presentation, *IEEE PES GM*, Vancouver, Canada, July 21-25.

Auswin G. Thomas (presenter), Pedram Jahangiri, Di Wu, Chengrui Cai, Huan Zhao, Dionysios C. Aliprantis, and Leigh Tesfatsion (2013), **“Intelligent Residential Air-Conditioning System with Smart-Grid Functionality,”** presentation, *IEEE PES GM*, Vancouver, Canada, July 21-25.

Leigh Tesfatsion (2012), **“Energy and Reserve Procurement Through Linked Forward Markets: Safe Harbor for the Promised Land,”** presentation, Dept. of Energy (DOE), Washington D.C., September 17.

Auswin George Thomas (presenter), Chengrui Cai, Dionysios C. Aliprantis, and Leigh Tesfatsion (2012), **“Effects of Price-Responsive Residential Demand on Retail and Wholesale Power Market Operations,”** presentation, *IEEE PES GM*, San Diego, CA, July 22-26.

Pedram Jahangiri (presenter), Di Wu, Wanning Li, Dionysios C. Aliprantis, and Leigh Tesfatsion (2012), **“Development of an Agent-Based Distribution Test Feeder with Smart-Grid Functionality,”** presentation, *IEEE PES GM*, San Diego, CA, July 22-26.

Abhishek Somani (presenter) and Leigh Tesfatsion (2011), **“Wind Power Trading by Firms with Mixed Generation Portfolios,”** presentation, *Institute for Operations Research and Management Science (INFORMS)*, Charlotte, North Carolina, November.

Chengrui Cai (presenter), Pedram Jahangiri, Auswin George Thomas, Huan Zhao, Dionysios C. Aliprantis, and Leigh Tesfatsion (2011), **“Agent-Based Simulation of Distribution Systems with High Penetration of Photovoltaic Generation,”** presentation, *IEEE PES GM*, Detroit, MI, July 24-30.

Huan Zhao (presenter), Auswin George Thomas, Pedram Jahangiri, Chengrui Cai, Leigh Tesfatsion, and Dionysios C. Aliprantis (2011), "**Two-Settlement Electric Power Markets with Dynamic-Price Customers,**" presentation, presentation, *IEEE PES GM*, Detroit, MI, July 24-30.

Huan Zhao (presenter) and Leigh Tesfatsion (2011), "**Wind Power Trading by Firms with Mixed Generation Portfolios,**" presentation, *17th International Conference on Computing in Economics and Finance (CEF'11)*, San Francisco, June 29-July 1.

Leigh Tesfatsion (2011), "**Integrated Retail and Wholesale Power System Operations with Smart-Grid Functionality,**" presentation, *NSF Workshop: Engineering and Social Response to the Energy-Climate Nexus*, NSF Stanford II, Arlington, VA, June 23-24.

Leigh Tesfatsion (2011), "**Experimental Study of Restructured Electric Power Markets via Agent-Based Test Beds,**" presentation, Pacific Northwest National Laboratory," Richland, WA, June 18.

Leigh Tesfatsion (2011), "**ISO Net Surplus Collection and Allocation in North American Restructured Electric Power Markets,**" presentation, *Allied Social Science Association/American Economic Association (ASSA/AEA) Meetings*, Denver, Colorado, January 7-9.

Nanpeng Yu (co-presenter), Abhishek Somani (co-presenter), and Leigh Tesfatsion (2010), "**Financial Risk Management in Restructured Wholesale Power Markets: Concepts and Tools,**" presentation, *IEEE PES GM*, Mpls, MN, July 25-29.

Qun Zhou (presenter), Leigh Tesfatsion, and Chen-Ching Liu (2010), "**Global Sensitivity Analysis for the Short-Term Prediction of System Variables,**" presentation, *IEEE PES GM*, Mpls., MN, July 25-29.

Dionysios Aliprantis, Scott Penick, Leigh Tesfatsion, and Huan Zhao (2010), "**Integrated Retail and Wholesale Power System Operation with Smart-Grid Functionality,**" presentation, *IEEE PES GM*, Minneapolis, MN, July 25-29.

Junjie Sun (presenter) and Leigh Tesfatsion (2010), "**Testing Institutional Arrangements via Agent-Based Modeling: A U.S. Electricity Market Application,**" presentation, *16th International Conference on Computing in Economics and Finance*, sponsored by the Society for Computational Economics, hosted by City University London, July 15-17.

Leigh Tesfatsion (2010), "**Agent-Based Modeling of Electric Power Markets,**" presentation, *DARPA ISAT Workshop on Modeling and Measuring of Societal Resilience*, MIT RLE Conference Center, Cambridge, MA, July 12-13.

Leigh Tesfatsion (2010), "**An Agent-Based Test Bed for the Integrated Study of Retail and Wholesale Power System Operations,**" presentation, *Agent Technologies for Energy Systems (ATES 2010) Workshop*, Toronto, Canada, May 11.

Leigh Tesfatsion (2010), "**Testing Institutional Arrangements via Agent-Based Modeling: A U.S. Electricity Market Example,**" presentation, *Waterloo Institute of Complexity and Innovation (WICI) Colloquium*, University of Waterloo, Ontario, Canada, March 22.

Leigh Tesfatsion (2009), "**Stress Testing Institutional Arrangements via Agent-Based Modeling: Illustrative Results for U.S. Restructured Electric Power Markets,**" presentation, Sloan Foundation, New York City, NY, October 2.

Leigh Tesfatsion (2009), "**Auction Basics for Wholesale Power Markets: Objectives and Pricing Rules,**" presentation, *IEEE PES GM*, Calgary, Alberta, CA, July 26-30.

Hongyan Li (presenter) and Leigh Tesfatsion (2009), "**The AMES Wholesale Power Market Test Bed: A Computational Laboratory for Research, Teaching, and Training,**" presentation, *IEEE PES GM*, Calgary, Alberta, CA, July 26-30.

Hongyan Li (presenter) and Leigh Tesfatsion (2009), "**Development of Open Source Software for Power Market Research: The AMES Test Bed,**" presentation, *IEEE PES GM*, Calgary, CA, July 26-30.

Haifeng Liu (presenter) and Leigh Tesfatsion (2009), "**Locational Marginal Pricing Basics for Restructured Wholesale Power Markets,**" presentation, *IEEE PES GM*, Calgary, July 26-30.

Leigh Tesfatsion (2009), "**Stress-Testing Institutional Arrangements via Agent-Based Modeling Illustrative Results for U.S. Restructured Electric Power Markets,**" presentation, *Interdisciplinary Center for Economic Science (ICES)*, George Mason U., Fairfax, VA, April 3.

Qun Zhou (presenter) and Leigh Tesfatsion (2009), "**Scenario Generation for Price Forecasting in Restructured Wholesale Power Markets,**" presentation, *IEEE PES GM*, Seattle, WA, March 15-18.

Hongyan Li (presenter) and Leigh Tesfatsion (2009), "**Capacity Withholding in Restructured Wholesale Power Markets: An Agent-Based Test Bed Study,**" presentation, *IEEE Power Systems Conference and Exposition*, Seattle, WA, March 15-18.

Junjie Sun (presenter) and Leigh Tesfatsion (2008), "**Dynamic LMP Response Under Alternative Price-Cap and Price-Sensitive Demand Scenarios,**" presentation, *Institute for Operations Research and Management Science (INFORMS)*, Washington DC, October 12-15.

Hongyan Li (presenter) and Leigh Tesfatsion (2008), "**Dynamic LMP Response Under Alternative Price-Cap and Price-Sensitive Demand Scenarios,**" presentation, *IEEE PES GM*, David L. Lawrence Convention Center, Pittsburgh, PA, July 21-24.

Junjie Sun (presenter) & Leigh Tesfatsion (2008), "**Dynamic Price Response Under Alternative Price-Cap and Price-Sensitive Demand Scenarios: Experimental Evidence from a Simulated Wholesale Electric Power Market,**" presentation, *North American Summer Meetings of the Econometric Society*, Carnegie-Mellon University, Pittsburgh, PA, June 19-22.

Junjie Sun (presenter) and Leigh Tesfatsion (2008), "**Dynamic LMP Response Under Alternative Price-Cap and Price-Sensitive Demand Scenarios,**" presentation, *International Industrial Organization Conference (IIOC)*, Washington, D.C., May 16-18.

Leigh Tesfatsion (co-presenter) and Bart Wilson (co-presenter) (2008), "**Agent-Based Computational Economics and Behavioral Modeling: Potential Applications to Energy Science and Technologies,**" presentation, *Symposium (Webcast), Department of Energy - National Renewable Energy Laboratory (DOE-NREL)*, Washington, D.C., February 22.

Lynne Kiesling (co-presenter) and Leigh Tesfatsion (co-presenter) (2008), "**A Test Bed for the Integrated Experimental Study of Retail and Wholesale Power Market Designs: Seaming GridLAB-D with AMES,**" presentation, Tele-Seminar (Webcast), *Pacific Northwest National Laboratory (PNNL)*, Richland, WA, February 15.

Leigh Tesfatsion (2008), "**Agent-Based Test Beds for Power Industry Research, Teaching, and Training,**" presentation (Tele-Seminar/Webcast), *Power Systems Energy Research Center (PSERC)*, Cornell University, Ithaca, NY, February 5.

Nanpeng Yu (presenter), Chen-Ching Liu, & Leigh Tesfatsion (2007), "**Modeling of Suppliers' Learning Behaviors in an Electricity Market Environment,**" presentation, *14th International Conf. on Intelligent Systems Applications to Power Systems (ISAP 2007)*, Kaohsiung, Taiwan, Nov 5.

Leigh Tesfatsion (2007), "**Open-Source Software for Power Industry Research, Teaching, and Training: A DC-OPF Illustration,**" presentation, *IEEE PES GM*, Tampa, Florida, June 24-28.

Leigh Tesfatsion (2007), "**An Agent-Based Computational Laboratory for Wholesale Power Market Design,**" presentation, *IEEE PES GM*, Tampa, Florida, June 24-28.

Junjie Sun (presenter) and Leigh Tesfatsion (2007), "**Dynamic Testing of Wholesale Power Market Designs: An Agent-Based Computational Approach,**" presentation, *North American Summer Meetings of the Econometric Society*, Duke University, Durham, NC, June 21-24.

Junjie Sun (presenter) and Leigh Tesfatsion (2007), "**Dynamic Testing of Wholesale Power Market Designs: An Agent-Based Computational Approach,**" presentation, *13th International Conference on Computing in Econ. and Finance, Society for Computational Economics (SCE)*, Montreal, CA, June 14-16.

Leigh Tesfatsion (2007), "**Modeling Behavior, Learning, and Social Interactions in Dynamic Economic Contexts: An Agent-Based Computational Approach,**" presentation, *Center for the Advancement of Computational Research (CACR) Invited Lecture in Business*, Miami University, Oxford, Ohio, April 20.

Junjie Sun (presenter) and Leigh Tesfatsion (2007), "**Dynamic Testing of Wholesale Power Market Designs: An Agent-Based Computational Approach,**" presentation, *5th Annual International Industrial Organization Conference (IIOC)*, Savannah, Georgia, April 14-15.

Leigh Tesfatsion (2007), "**Agent-Based Computational Economics: A Constructive Approach to Economic Theory,**" presentation, *Allied Social Science Assoc. (ASSA) Annual Meet.* Chicago, IL, Jan 5-7.

Junjie Sun (presenter) and Leigh Tesfatsion (2007), "**Agent-Based Test Beds for Market Design,**" presentation, *Allied Social Science Associations (ASSA) Annual Meeting*, Chicago, IL, January 5-7.

Junjie Sun (presenter) and Leigh Tesfatsion (2006), **"Dynamic Testing of Wholesale Power Market Designs: An Agent-Based Computational Approach,"** presentation, *Institute for Operations Research and Management Science (INFORMS)*, Pittsburgh, PA, Nov. 5-8.

Steven Widergren, Junjie Sun, and Leigh Tesfatsion (presenter) (2006), **"Market Design Test Environments,"** presentation, *IEEE PES GM*, Montreal, Canada, June 19-22.

Leigh Tesfatsion (2006), **"Testing the Efficiency and Reliability Impacts of MISO's Midwest Market Initiative: An Agent-Based Computational Approach,"** presentation, *Forty-Third Annual Meeting of the Electric Power Research Center (EPRC)*, Scheman Building, Iowa State University, Ames, IA, May 10.

Leigh Tesfatsion (2006), **"Testing the Efficiency and Reliability Impacts of MISO's Midwest Market Initiative: An Agent-Based Computational Approach,"** presentation, *Joint meeting of the Iowa Utilities Board and NSF/EPRC energy project groups*, Iowa State University, Ames, IA, April 21.

Leigh Tesfatsion (2006), **"Dynamic Testing of Wholesale Power Market Designs: An Agent-Based Computational Approach,"** presentation, *2006 International Industrial Organization Conference*, Boston, MA, April 7-9.

Leigh Tesfatsion (2006), **"Testing the Reliability of Wholesale Power Market Designs: An Iterative Participatory Modeling Approach,"** presentation (Plenary Panel Address), *NSF-DDDAS Workshop, National Science Foundation*, Washington D.C., January 19-20, 2006.

Leigh Tesfatsion (2005), **"An Agent-Based Computational Laboratory for Testing the Economic Reliability of Wholesale Power Market Designs,"** presentation, *11th International Conference on Computing in Economics and Finance (CEF2005)*, Society for Computational Economics (SCE), Washington, D.C., June 23-25.

Deddy Koesrindartoto, Junjie Sun, and Leigh Tesfatsion (presenter) (2005), **"An Agent-Based Computational Laboratory for Testing the Economic Reliability of Wholesale Power Market Designs,"** presentation, *IEEE PES GM*, San Francisco, CA, June 12-16.

Leigh Tesfatsion (2005), **"Agent-Based Electricity Market Design: Operational Validation Issues,"** presentation, *Workshop on Empirical Agent-Based Modeling*, Indiana Univ., Bloomington, IN, June 3.

Leigh Tesfatsion (2005), **"Testing the Economic Reliability of FERC's Wholesale Power Market Platform: An Agent-Based Computational Approach,"** presentation, *ECpE Seminar Series*, Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, March 29.

Deddy Koesrindartoto (presenter) and Leigh Tesfatsion (2004), **"A Computational Laboratory for Pre-Testing the Reliability of Restructured Wholesale Power Markets,"** presentation, *Institute for Operations Research and Management Science (INFORMS) Annual Meeting*, Denver, CO, Oct 24-27.

Deddy Koesrindartoto (presenter) and Leigh Tesfatsion (2004), **"Testing the Reliability of FERC's Wholesale Power Market Platform: An Agent-Based Computational Economics Approach,"** presentation, *24th USAEE/IAEE North American Conference*, Washington, D.C., July 8-10.

Deddy Koesrindartoto (presenter) and Leigh Tesfatsion (2003), "**Electricity Market Design: An Agent-Based Computational Economics Approach**," presentation, *Complex Adaptive Systems Seminar*, Iowa State University, Ames, IA, December 8.

Deddy Koesrindartoto and Leigh Tesfatsion (presenter) (2003), "**Testing the Reliability of FERC's Wholesale Power Market Platform: An Agent-Based Computational Economics Approach**," presentation, *IMA Hot Topics Workshop on Agent-Based Modeling and Simulation, Institute for Mathematics and its Applications (IMA)*, University of Minnesota, Minneapolis, MN, November 3.

Leigh Tesfatsion (2003), "**Electricity Market Design: An Agent-Based Computational Economics Approach**," presentation, *James Franck Institute Computations in Science Distinguished Lecture Series*, sponsored by the University of Chicago and Argonne National Laboratory, Chicago, IL, October 29.

James Nicolaisen, Valentin Petrov (presenter), Matthew Smith, Leigh Tesfatsion (2000), "**Concentration and Capacity Effects on Electricity Market Power**," presentation, *2000 IEEE Congress on Evolutionary Computation (CEC'2000)*, San Diego, CA, July 16-19.

Leigh Tesfatsion (1979), "**Criterion Decomposition for the Myopic Sequential Control of Uncertain Systems**," presentation, *13th Annual Asilomar Conf. on Circuits, Systems, & Computers*, IEEE Computer Society, Pacific Grove, CA, Nov 5-7.

Leigh Tesfatsion (1978), "**Criterion Filtering Methods for Adaptive Control**," presentation, *12th Annual Asilomar Conf. on Circuits, Systems, & Computers*, IEEE Computer Society, Pacific Grove, CA, Nov 6-8.

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ECpE OPEN-SOURCE SOFTWARE (OSS) TEST-SYSTEM RELEASES:

AMES Market Package (Java/Python): Homepage

Agent-Based Modeling of Electricity Systems (AMES)

<https://www2.econ.iastate.edu/tesfatsi/AMESMarketHome.htm>

AMES V5.0 (Java/Python) -- Latest AMES release (2020): GitHub Repository

<https://github.com/ames-market/AMES-V5.0>

DCOPFJ (Java) -- A DC Optimal Power Flow solver for AMES V2.06 and V2.07: Homepage

<https://www2.econ.iastate.edu/tesfatsi/DCOPFJHome.htm>

Eight-Zone ISO-NE Test System (Java/Python): BitBucket Repository

An eight-zone test system for an ISO-managed wholesale electric power market based on ISO New England data, implemented via AMES V4.0. <https://bitbucket.org/kdheepak/eightbustestbedrepo>

ERCOT Test System (Java/Python): GitHub Repository

An agent-based test system modeling wholesale power market operations in the Electric Reliability Council of Texas (ERCOT), implemented via AMES V5.0.

<https://github.com/ITDProject/ERCOTTestSystem>

ITD Project/Household Formulation (Python): GitHub Repository

<https://github.com/ITDProject/HouseholdFormulationRepository>

ITD TES Platform V2 (Co-Simulated, Java/Python/C++/C): GitHub Repository:

<https://github.com/ITDProject/ITDTESPlatform>