

## YIHSU CHEN, Ph.D.

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### EDUCATION

THE JOHNS HOPKINS UNIVERSITY, Baltimore, MD, USA  
Ph.D. Environmental and Energy Economics, Oct., 2006

HARVARD UNIVERSITY, Boston, MA, USA  
M.S. in Environmental Health and Health Policy and Management, May, 1999

TUNGHAI UNIVERSITY, Taichung, Taiwan  
B.S. in Environmental Science & Engineering, June, 1995

### RESEARCH

Economics and Policy Studies in Energy, Transportation and Water Resources.

### EMPLOYMENT

<b>Associate Professor</b> , University of California, Santa Cruz, CA	2015–present
<b>Associate Professor</b> , University of California, Merced, CA	2012–2015
<b>Visiting Associate Professor</b> , Baptist University, Hong Kong	Summer, 2014
<b>Visiting Associate Professor</b> , GRIPS, Tokyo, Japan	7/2013–5/2014
<b>Assistant Professor</b> , University of California, Merced, Merced, CA	2006–2012

### PUBLICATIONS

<https://orcid.org/0000-0002-9990-8232>

#### A. Referred Journal

48.\* **Chen, Y.**, D. Zhang, and R. Takashima (2019) “Carbon Emissions Forensic in Energy Sector: Is It Worth the Effort?” *Energy Policy*. (doi.org/10.1016/j.enpol.2019.01.050)

47.\* Squiddi, A, M. Tanaka, and **Y. Chen** (2018) “Sustainable Transmission Planning in Imperfectly Competitive Electricity Industries: Balancing Economic and Environmental Outcomes,” *European Journal of Operations Research*. 275: 208–223. (doi.org/10.1016/j.ejor.2018.11.032)

46.\* Sato, K. and **Y. Chen**. (2018) “Analysis of High-speed Rail and Airline Transport Cooperation in Presence of Non-purchase Option.” *Journal of Modern Transportation*

45.\* **Chen, Y.**, M. Tanaka, and A. Squiddi. (2018) “Market Power with Tradable Performance-Based CO<sub>2</sub> Emission Standards in the Electricity Sector.” *The Energy Journal*, 39(6): 95–119. (doi.org/10.5547/01956574.39.6.yche)

44.\* Chang, D.-S., **Y. Chen**, and Tsai, W. (2018) “How Injury Incidence is Associated with the Business Cycle? Evidence from Taiwan,” *Safety Science*, 110: 235–248. (doi.org/10.1016/j.ssci.2018.08.014)

43.\* Woo, C.K., **Y. Chen**, J. Zarnikau, A. Olson, J. Moore, T. Ho (2018) “Carbon tradings impact on Californias real-time electricity market prices,” *Energy*, 159: 579–587. (/doi.

org/10.1016/j.energy.2018.06.188)

- 42.\* Zhang, D., **Y. Chen**, and M. Tanaka (2018) “On the Effectiveness of Tradable Performance-based Standards,” *Energy Economics*, 74: 456–469. (doi.org/10.1016/j.eneco.2018.06.012)
- 41.\* **Chen, Y.** and M. Tanaka (2018) “Permit Banking in Emission Trading: Competition, Arbitrage and Linkage,” *Energy Economics*, 71: 70–82. (doi.org/10.1016/j.eneco.2018.01.032)
- 40.\* Woo, C.K., J. Zarnikau, **Y. Chen**, A. Olson, J. Moore, T. Ho, Y. Liu, X. Luo (2018) “An empirical analysis of California’s hybrid capacity options,” *The Electricity Journal*, (31): 7–12. (doi.org/10.1016/j.tej.2018.02.005)
- 39.\* Liu, L. A and **Y. Chen** (2017) “Price Containment in Emissions Permit Markets: Balancing Market Risk and Environmental Outcomes,” *IIE Transactions*, 49(12): 1129–1149. (doi.org/10.1080/24725854.2017.1362506)
- 38.\* A. Olson, C.K. Woo, **Y. Chen**, J. Moore, N. Schlag, A. Ong, T. Ho (2017) “Does California’s CO2 price affect wholesale electricity prices in the Western U.S.A.?” *Energy Policy*, (110): 9–19. (doi.org/10.1016/j.enpol.2017.07.059)
- 37.\* C.-K. Woo, **Y. Chen**, A. Olson, J. Moore, N. Schlag, A. Ong, and T. Ho (2017) “Electricity price behavior and carbon trading: New evidence from California,” *Applied Energy*, 204: 531–543. (doi.org/10.1016/j.apenergy.2017.07.070)
- 36.\* V. Viskovic, **Y. Chen** and Siddiqui, A. (2017) “Implications of the EU Emissions Trading System for the South-East Europe Regional Electricity Market,” *Energy Economics*, 65: 251–261. (doi.org/10.1016/j.eneco.2017.04.033)
35. Zhang, L., G. Hu, L. Wang, and **Y. Chen**, (2016), “A Bottom-up Biofuel Market Equilibrium Model for Policy Analysis,” *Annals of Operations Research*, 236(1): 75–101.
- 34.\* Siddiqui, A., M. Tanaka and **Y. Chen** (2016) “Are Targets for Renewable Portfolio Standards Too Low? The Impact of Market Structure on Energy Policy,” *European Journal of Operational Research* 250 (1): 328–341. (doi.org/10.1016/j.ejor.2015.10.063)
- 33.\* Ding, Y., C. Kang, J. Wang, **Y. Chen**, B. F. Hobbs (2015). Foreword for the Special Section on Power System Planning and Operation Towards a Low-Carbon Economy. *IEEE Transactions on Power Systems* 30(2):1015–1016. (DOI:10.1109/TPWRS.2015.2393392)
- 32.\* **Chen, Y.**, B. F. Hobbs, H. Ellis, C. Crowley and F. Jutz, (2015), “Impacts of Climate Change on Power Sector NOx Emissions: A Long-Run Analysis of the US Mid-Atlantic Region,” *Energy Policy*, 84:11–21. (doi.org/10.1016/j.enpol.2015.04.013)
- 31.\* Huang Y. and **Y. Chen**, (2014) “Analysis of an Imperfectly Competitive Cellulosic Biofuel Supply Chain,” *Transportation Research E: Logistics and Transportation Review*, 72:1–14. (doi.org/10.1016/j.tre.2014.09.008)
- 30.\*\* Hu, G. , L. Wang, **Y. Chen**, and B. Bidanda, (2014) “An Oligopoly Model to Analyze the Market and Social Welfare for Green Manufacturing Industry,” *Journal of Cleaner Production*, 85: 94–103. (doi.org/10.1016/j.jclepro.2014.01.016)
- 29.\*\* Bushnell, B., **Y. Chen**, and M. Zaragoza, (2014) “Downstream Regulation of CO2 Emissions in California’s Electricity Sector,” *Energy Policy*, 64: 313–323. (doi.org/10.1016/j.enpol.2013.08.065)
- 28.\*\* **Chen Y.** and A. L. Liu, (2013) “Emissions Trading, Point-of-Regulation and Facility Siting Choices in the Electric Markets,” *Journal of Regulatory Economics*, 44(3): 251–286.

- 27.\*\* Limpaitoon, T, **Y. Chen** and S. S. Oren (2013) “The Impact of Imperfect Emission Permit Market on Congested Electricity Market Equilibrium,” *The Energy Journal* 35(3): 145–166.
- 26.\*\* Tanaka M. and **Y. Chen** (2013) “Market Power in Renewable Portfolio Standards,” *Energy Economics* 39: 187–196. (doi.org/10.1016/j.eneco.2013.05.004)
- 25.\*\* Tanaka, M. and **Y. Chen** (2012) “Emissions Trading in Forward and Spot Markets of Electricity ,” *The Energy Journal* 33(2): 195–221 .
- 24.\*\* Bushnell, J. and **Y. Chen** (2012) “Allocation and Leakage in Cap-and-Trade Markets for CO<sub>2</sub>,” *Resources and Energy Economics*, 34(3): 647–668. (dx.doi.org/10.1016/j.reseneeco.2012.05.008)
- 23.\*\* Tsao, C.-C., J. E. Campbell, M. Mena-Carrasco, S. N. Spak, G. R. Carmichael, and **Y. Chen**, (2012) “Biofuels that Cause Land-Use Change May Have Much Larger Non-GHG Air Quality Emissions than Fossil Fuels,” *Environmental Science & Technology*, 46: 10835–10841. (DOI:10.1021/es301851x)
22. **Chen Y** and L. Wang (2013) “Renewable Portfolio Standards in the Presence of Green Consumers and Emission Trading Programs,” *Networks and Spatial Economics*, 13(2): 149–181. DOI: 10.1007/s11067-012-9176-0
21. Sijm J., **Y. Chen** and B. F. Hobbs (2012) “The Impact of Power Market Structure on the Pass-through of CO<sub>2</sub> Emissions Trading costs to Electricity Prices—A Theoretical Approach,” *Energy Economics*, 34:1143–1152. (DOI:10.1016/j.eneco.2011.10.002)
20. Tsao, C.-C., J.E. Campbell, M. Mena-Carrasco, S.N. Spak, S.N, and G.R. Carmichael and **Y. Chen** (2012) “Increased estimates of air-pollution emissions from Brazilian sugarcane ethanol,” *Nature Climate Change*, 2(1): 53–57. (doi:10.1038/nclimate1325)
19. Tanaka, M. and **Y. Chen** (2012) “Market Power in Emissions Trading: Strategically Manipulating Permit Price through Fringe Firms,” *Applied Energy* 96:203-211. DOI:10.1016/j.apenergy.2011.08.049
18. **Chen, Y.** and A. Whalley (2012) “Green Infrastructures? The Effects of Urban Mass Transit on Air Quality,” *American Economics Journal: Economic Policy*, 4(1): 58-97. (media: http://www.centralvalleybusinesstimes.com/stories/001/?ID=18761)
17. Limpaitoon, T, **Y. Chen** and S. S. Oren (2011) “The Impact of Carbon Cap and Trade Regulation on Congested Electricity Market Equilibrium,” *Journal of Regulatory Economics*, 40(3): 237–260.
16. Tan, Z., L. Li, J. Wang and **Y. Chen** (2011) “Examining Economic and Environmental Impacts of Differentiated Pricing on the Energy-intensive Industries in China: An Input-Output Approach” *Journal of Energy Engineering*, 137(3): 130–137.
15. **Chen, Y.**, A. L. Liu and B. F. Hobbs (2011) “Economic and Emissions Implications of Load-based, Source-based and First-seller Emissions Trading Programs under California AB32,” *Operations Research*, 59(3): 696–712.
14. C-C Tsao, J. E. Campbell, and **Y. Chen** (2011) “When Renewable Portfolio Standards Meet Cap-and-Trade Regulations in the Power Sector: Market Interactions, Profit Implications, and Policy Redundancy,” *Energy Policy*, 39(7): 3966–3974. (doi.org/10.1016/j.enpol.2011.01.030)
13. **Chen, Y.** and C.-L. Tseng (2011) “Inducing Clean Technology in the Electricity Sector: Tradable Permits or Carbon Tax Policies?” *The Energy Journal*, 32(3): 149–174.
12. Wang, L., A. Lin and **Y. Chen** (2010) “Potential Impact of Recharging Plug-in Hy-

brid Electric Vehicles on Locational Marginal Prices from Electricity Generation,” *Naval Research Logistics Journal*, 57(8): 689–700. (DOI:10.1002/nav.20431)

11. Paul, A, K. Palmer, M. Ruth, B. F. Hobbs, D. Irani, J. Michaels, **Y. Chen**, K. Ross, E. Myers (2010) “The Role of Energy Efficiency Spending in Maryland’s Implementation of the Regional Greenhouse Gas Initiative,” *Energy Policy*, 38: 6820–6829. (doi.org/10.1016/j.enpol.2010.06.055)

10. Ruth, M. A. Blohm, J. Mauer, S. A. Gabriel, B. F. Hobbs and **Y. Chen** (2010) “Strategies for Carbon Dioxide Emissions Reductions: Residential Natural Gas Efficiency, Economic and Ancillary Health Impacts in Maryland,” *Energy Policy*, 38: 6926–6935 (doi.org/10.1016/j.enpol.2010.07.009)

9. Hobbs, B.F., M-C Hu, **Y. Chen**, J.H. Ellis, A. Paul, D. Burtraw and K. Palmer (2010) “From Regions to Stacks: Spatial and Temporal Downscaling of Power Pollution Scenarios,” *IEEE Transactions on Power System*, 25(2): 1179–1189. (DOI:10.1109/TPWRS.2009.2036801)

8. Mignone, B. K., M.D. Hurteau, **Y. Chen** and B. Sohngen (2009) “Carbon offsets, reversal risk and US climate policy,” *Carbon Balance and Management*, 4(3): 1–6. (doi.org/10.1186/1750-0680-4-3)

7. **Chen, Y.** (2009) “Does a regional greenhouse gas policy make sense? A case study of carbon leakage and emissions spillover,” *Energy Economics*, 31:667–675. (doi.org/10.1016/j.eneco.2009.02.003)

6. Ruth, M., S. Gabriel, K. Palmer, D. Burtraw, A. Paul, **Y. Chen**, B.F. Hobbs, D. Irani, J. Michael, K. Ross, R. Conklin and J. Miller (2008) “Economics and Energy Impacts from Participation in the Regional Greenhouse Gas Initiative: A Case Study of the State of Maryland,” *Energy Policy*, 36: 2279–2289. (doi.org/10.1016/j.enpol.2008.03.012)

5. **Chen, Y.** and C.-L. Tseng (2008) “Climate Policies and the Power Sector: Challenges and Issues,” *Journal of Energy Engineering*, 134(2): 31–32.

4. **Chen, Y.**, J. Sijm, B.F. Hobbs, W. Lise (2008) “Implications of CO<sub>2</sub> Emissions Trading for Short-run Electricity Market Outcomes in Northwest Europe,” *Journal of Regulatory Economics*, 34(3): 251–281.

3. Sijm, J., K. Neuhoff, and **Y. Chen** (2006) “CO<sub>2</sub> Costs Pass Through and Windfall Profits in the Power Sector,” *Climate Policy*, 6(1): 49–72. (doi.org/10.1080/14693062.2006.9685588)

2. **Chen, Y.**, B.F. Hobbs, S. Leyffer and T. Munson (2006) “Leader-follower equilibria for electric power and NO<sub>x</sub> allowances markets,” *Computational Management Science*, 3(4): 307–330.

1. **Chen, Y.** and B.F. Hobbs (2005) “An Oligopolistic Power Market Model with Tradable NO<sub>x</sub> Permits,” *IEEE Transactions on Power Systems*, 20(1): 119–29. (DOI:10.1109/TPWRS.2004.840440)

#### Under Review

“A Power Market Model in Presence of Strategic Prosumers” with Sepehr Ramyar and Andrew L. Liu

“Death Spiral, Transmission Costs, and Prosumers in the Power Market” with Ryuta Takashima

#### Selected Presentations (2014–)

“A Leader-follower Model for Tradable Performance-Based CO<sub>2</sub> Emissions Standards,” IEEE SMC 2018, Miyazaki, Japan, Oct. 7–10, 2018 (Makoto Tanaka, Afzal Siddiqui).

“A Power Market Model in Presence of Strategic Prosumers,” 3rd Annual CROSS Research Symposium & UCSC Systems Oktoberfest, Santa Cruz, CA, USA, Oct. 3–4, 2018 (with Sepehr Ramyar)

“Economic and environmental consequences of market power in the South-East Europe regional electricity market,” EURO 2018, Valencia, Italy, July 8–11, 2018 (with Afzal Siddiqui, Verena Viskovic, and Makoto Tanaka)

“A Oligopoly Power Market Model in Presence of Strategic Prosumers,” INFORMS International, Taipei, Taiwan, June 17–20, 2018 (with Sepehr Ramyar)

“A Oligopoly Power Market Model in Presence of Strategic Prosumers,” National Central University, Department of Business Management, Taoyuan, Taiwan, June 20, , 2018 (with Sepeh Ramyar)

“Regulatory Jurisdiction and Policy Coordination: A Bi-level Modeling Approach for Performance-based Policy,” INFORMS International, Taipei, Taiwan, June 17–20, 2018 (with Makoto Tanaka, Afzal S. Siddiqui)

“Carbon Emissions Forensic in Energy Sector: Is it Necessary?,” INFORMS Annual, Houston, TX, Oct 22–25.

“Analysis of Climate-induced Vulnerability of Northern California Natural Gas System,” INFORMS Annual, Houston, TX, Oct 22–25 (with Sepehr Ramyar).

“Leader-Follower Model for Policymakers: A Case of Optimal Performance-Based Policy,” IAEE European Conference, Vienna, Austria, Sep. 3–6, 2017 (with Makoto Tanaka).

“Pure or Hybrid?: Policy Options for Renewable Energy,” IAEE European Conference, Vienna, Austria, Sep. 3–6, 2017 (with Makoto Tanaka, Ryuta Takashima, and Yuta Kamobayashi).

“Investigating Climate-change-induced Vulnerability of the Northern California Natural Gas Energy System and Identifying Resilience Options,” California Energy Commission, Sacramento, CA, May 11, 2017.

“Investigating Climate-change-induced Vulnerability of the Northern California Natural Gas Energy System and Identifying Resilience Options,” California Climate Change Symposium 2017, Sacramento, CA, January 25–26, 2017 (poster).

“US EPA Tradable Performance-Based CO2 Emissions Standards: Walking on Thin Ice?,” Department of Earth Resource Engineering and Environmental Science, Akita University, Akita, Japan, December 16, 2016

“US EPA Tradable Performance-Based CO2 Emissions Standards: Walking on Thin Ice?,” Symposium on New Course for Value and Systems Innovation (Keynote Speech), Tokyo University of Sciences, Tokyo, Japan, December 10, 2016

“Solving Conflicts: Fun of Equilibrium Modeling,” Tokyo University of Sciences, Tokyo, Japan, December 7, 2016.

“Market Power in Performance-based Permit Trading Policies: Walk on the Thin Ice?,” IAEE International Conference, Bergen, Norway, June 19-23, 2016 (with Makoto Tanaka, Afzal Siddiqui)

“Analysis of Regional Market Impact of the US EPAs Clean Power Plan: mass-based vs.rate-based standard,” INFORMS Annual Conference, Philadelphia, PA, Nov. 1-4, 2015 (with Makoto Tanaka, Duan Zhang)

“Do Emission Caps Lead to Carbon Leakage in Regional Markets? A Case Study of South-east Europe,” INFORMS Annual Conference, Philadelphia, PA, Nov. 1-4, 2015 (with Afzal

Siddiqui, Verena Viskovic).

“A Bottom-up Biofuel Market Equilibrium Model for Policy Analysis, INFORMS Annual Conference, Philadelphia, PA, Nov. 1-4, 2015 (with Leilei Zhang, Guiping Hu).

“Analysis of Regional Market Impact of the US EPAs Clean Power Plan: mass-based vs.rate-based standard,” Urban Operations Research Workshop, Nagoya, Japan, Dec. 12, 2015.

“Analysis of Regional Market Impact of the US EPAs Clean Power Plan: mass-based vs.rate-based standard,” USAEE North America Annual Conference, Pittsburgh, PA, USA, Oct. 25–28, 2015. (with Makoto Tanaka and Duan Zhang)

“Do Emission Caps Lead to Carbon Leakage in Regional Markets? A Case Study of South-east Europe,” USAEE North America Annual Conference, Pittsburgh, PA, USA, Oct. 25–28, 2015. (with Afzal Siddiqui, Verena Viskovic).

“Strategic Manipulation of Emission Permit Prices in the Energy Sector: What can We Learn from Modeling?,” Workshop on Systems Management and Control, University of Tsukuba, Japan, Dec. 11, 2015

“Are Targets for Renewable Portfolio Standards Too Low? The Impact of Market Structure on Energy Policy,” Department of Integrated Systems Engineering, Ohio State University, Oct 26, 2015 (with Makoto Tanaka, Afzal Siddiqui).

“Is Emission Trading A Safe Passage to the Promising Land?,” Department of Environmental Science and Engineering, Tunghai University, Taichung, Taiwan, June 14, 2015.

“Green Infrastructures? The Effects of Urban Mass Transit on Air Quality,” Graduate Institute of Environmental Engineering, National Taiwan University, Taipei, Taiwan, June 14, 2015. .

“Modeling Inter-temporal Permit Banking in Multi-sector Emission Trading Programs,” Urban Operations Research Workshop, Nagoya, Japan, Dec. 13, 2014.

“Emissions Trading: a Safe Passage to Promised Lands?” Department of Economics, Tohoku University, Sendai, Japan, April 1, 2014.

“Bottom-up equilibrium models in energy markets: introduction and applications,” Department of Industrial Administration, Tokyo University of Science, Chiba, Japan, May 1, 2014.

## PROFESSIONAL ACTIVITIES

Members, International Association of Energy Economics (IAEE)

Member, Institute of Operations Research and Management Sciences (INFORMS)

Associate Editor, IEEE Transactions on Power System (2013- present)

Associate Editor, ASCE Journal of Energy Engineering (2013- present)

International Advisory Board, Energy Policy (2017–present)

## HONORS AND AWARDS

Best Publication Award in Sustainability, *First Place*, ENRE (Energy, Natural Resources & the Environment) Section, INFORMS Annual Conference, San Francisco, CA, USA, Nov, 2014 (Title: *Economic and Emissions Implications of Load-based, Source-based and First-seller Emissions Trading Programs under California AB32*)

Best Publication Award in Sustainability, *Second Place*, ENRE (Energy, Natural Resources & the Environment) Section, INFORMS Annual Conference, Indianapolis, IN, USA, October, 2013 (Title: *Inducing Clean Technology in the Electricity Sector: Tradable Permits or Carbon Tax Policies?*)

Best Student Paper Award, *First Place*, ENRE (Energy, Natural Resources & the Environ-

ment) Section, INFORMS Annual Conference, Denver, CO, USA, October, 2004 (Title: *An Oligopolistic Electricity Market Model with Tradable NOx Permits*)

DISCCRS fellow (DISsertation initiative for the advancement of Climate Change ReSearch) IV Symposium: Climate Research and Leadership Network for New PhDs (<http://www.disc.crs.org/symphelp.html>)

## **FUNDING ACTIVITIES**

Short-run implications of the California Greenhouse Gas Emissions Performance Standard on the Power Sector and Regional GHG Emissions, University of California Energy Institute, (2007-2008); PI

Does the Regional Greenhouse Gas Policy Make Sense? A Case Study of Carbon Leakage in the Northeast Regional Greenhouse Gas Initiative, University of California, Merced, (2007-2008); PI

Further Analysis of Economic and Energy Impacts from Maryland's Participation in RGGI, Maryland Department of the Environment (subcontracted from University of Maryland College Park), (01/2008-06/2008); subcontract

Examining short-run economic and emissions implications of different emissions trading programs under California AB32, University of California Energy Institute, (2008-2009); PI

Sierra Nevada Watershed Ecosystem Enhancement, Environmental Defense Funds, (05/2008 - 3/2011), Co-PI

An Empirical Analysis of the US Power Plant Siting Decisions during 1995-2004, University of California, Merced, (2008-2009); PI

Mapping California Solar Irradiance and Its Implications for Power Sector, University of California Energy Institute, (2008-2009); Co-PI

Possible Ancillary Environmental Benefits and Costs of Natural Gas Energy Efficiency Programs, Maryland Department of the Environment (subcontracted from University of Maryland College Park), (01/2009-09/2009); subcontract

Implementation of Carbon Emissions Trading in Regional Electricity Markets, California Air Resources Board, (2010-2012); PI

Decision Analysis for the Four River Restoration Project in South Korea, US Army Corp. of Engineers, (05/2011-08/2011): PI

Propagating Climate-Driven Changes in Hydrologic Processes and Ecosystem Functions across Extreme Biophysical and Anthropogenic Gradients, National Science Foundation, (2012-2015); Co-PI

Impact of Plasma-assisted Biomass Gasification and Power Generation with Plasma Turbine on Air Quality, California Energy Commission, (2012-2015); Co-PI

RO Brine Treatment with Zero-Liquid Discharge, California Department of Water Resources, (2014-2017), Co-PI.

CyberSEES: Type 1: Collaborative Research: Sustainability-aware Management of Interdependent Power and Water Systems, National Science Foundation, (2016-2018); PI.

Investigating Climate-change-induced Vulnerability of the California Northern Natural Gas Energy System and Identifying Resilience Options, California Energy Commission, (2016-2018); PI

CRISP 2.0 Type 1: Collaborative Research: Distributed Edge Computing to Improve Resilience of Interdependent Systems, (2019-2020); PI.