

CHIARA LO PRETE

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ACADEMIC APPOINTMENTS

07/2020 – present: Associate Professor of Energy Economics, The Pennsylvania State University
07/2014 – 06/2020: Assistant Professor of Energy Economics, The Pennsylvania State University
09/2012 – 06/2014: Ziff Environmental Fellow, Harvard University

EDUCATION

2012: Ph.D., Geography and Environmental Engineering, The Johns Hopkins University
2009: M.S., Geography and Environmental Engineering, The Johns Hopkins University
2004: M.A., Energy Economics, Scuola Enrico Mattei, Milan, Italy
2003: B.A., Economics (summa cum laude), LUISS University, Rome, Italy

RESEARCH INTERESTS

- Competition and design of electricity markets
- Geopolitics of energy
- Natural gas markets
- Economics of energy infrastructure resilience
- Impacts of environmental regulations on power generation

WORK EXPERIENCE

2004 - 2007: Energy Analyst
Energy Studies Department, Eni S.p.A., Rome

TEACHING EXPERIENCE

The Pennsylvania State University

- Econometrics II (graduate)
- Introduction to Electricity Markets (undergraduate)
- Introduction to Energy and Environmental Economics (undergraduate)
- Corporate Finance (undergraduate)
- The Geopolitics of Energy (undergraduate)

The Johns Hopkins University

- Introduction to Applied Econometrics (undergraduate) (Instructor, winter intersession 2012)
- Microeconomics (undergraduate) (Teaching Assistant)

PUBLICATIONS

Notes: * denotes a supervised PSU student; ** denotes a postdoctoral scholar that I have mentored; *** denotes my Ph.D. or postdoctoral advisor.

Journal articles

S. Fang, A. M. Jaffe, T. Loch-Temzelides and C. Lo Prete (2024). “Electricity grids and geopolitical coercion: a game theoretic analysis of the synchronization of the Baltic states’ networks with continental Europe”. *Energy Policy* 188, 114068.

C. Lo Prete, A. Tyagi** and Q. Xu (2024). “California’s cap-and-trade program and emission leakage in the Western Interconnection: comparing econometric and partial equilibrium model estimates”. *Journal of the Association of Environmental and Resource Economists* 11(2), 359-402.

C. Lo Prete and S. Blumsack (2023). “Enhancing the reliability of bulk power systems against the threat of extreme weather: Lessons from the 2021 Texas electricity crisis”. *Economics of Energy & Environmental Policy* 12(2), 31-47.

A. Radhakrishnan* and C. Lo Prete (2023). “Bulk power system reliability and resilience: An overview of planning and market measures”. Book chapter in *Advancing the Resilience of the Power Grid under a Changing Climate*, Wiley-IEEE Press Book.

C. Hohl*, C. Lo Prete, A. Radhakrishnan* and M. Webster (2023). “Intraday markets, wind integration and uplift in a regional U.S. power system”. *Energy Policy* 175, 113503.

C. Lo Prete and A. Radhakrishnan* (2023). “Leaker-follower equilibria to examine investment decisions in grid resilience-enhancing measures”. *Risk Analysis* 43, 280-307.

N. Guo* and C. Lo Prete (2019). “Cross-product manipulation with intertemporal constraints: an equilibrium model”. *Energy Policy* 134, 1-10.

C. Lo Prete, W.W. Hogan***, B. Liu* and J. Wang* (2019). “Cross-product manipulation in electricity markets, microstructure models and asymmetric information”. *The Energy Journal* 40(5) 221-246.

C. Lo Prete, N. Guo* and U.V. Shanbhag (2019). “Virtual bidding and financial transmission rights: an equilibrium model for cross-product manipulation in electricity markets”. *IEEE Transactions on Power Systems* 34(2), 953-967.

A. Kleit, C. Lo Prete, S. Blumsack and N. Guo* (2019). “Weather or not? Welfare impacts of natural gas pipeline expansion in the Northeastern U.S.” *Energy Systems* 10(3), 593-633.

C. Lo Prete and B.F. Hobbs*** (2016). “A cooperative game theoretic analysis of incentives for microgrids in regulated electricity markets”. *Applied Energy* 169, 524-541.

C. Lo Prete and B.F. Hobbs*** (2015). “Market power in power markets: an analysis of residual demand curves in California’s day-ahead energy market in 1998-2000”. *The Energy Journal* 36(2), 191-218.

S. Cano-Andrade, M.R. von Spakovsky, A. Fuentes, C. Lo Prete and L. Mili (2015). “Upper level of a sustainability assessment framework for power system planning”. *Journal of Energy Resources Technology* 137(4), 1-11.

C. Lo Prete and C.S. Norman*** (2013). “Rockets and feathers in CO₂-power markets? New evidence from the second phase of the EU ETS”. *Energy Economics* 36, 312-321.

C. Lo Prete, B.F. Hobbs***, C.S. Norman***, S. Cano-Andrade, A. Fuentes, M.R. von Spakovsky and L. Mili (2012). “Sustainability and reliability assessment of microgrids in a regional electricity market”. *Energy* 41, 192-202.

Refereed conference proceedings

C. Hohl* and C. Lo Prete (2019). “Capacity markets versus energy-only markets: a comparison under increasing wind penetration”. *53rd Hawaii International Conference on System Sciences (HICSS-53)*, Maui, HI, January 7-10, 2020.

Y. Shan*, C. Lo Prete, G. Kesidis and D.J. Miller (2017). “A simulation framework for uneconomic virtual bidding in day-ahead electricity markets”. *Proceedings of the 2017 American Control Conference (ACC)*, Seattle, WA, May-24-26.

C. Lo Prete and B.F. Hobbs*** (2013). “Modeling the interaction between microgrids and electric utilities: a regulator’s perspective”. *Proceedings of the Fourth IEEE International Conference on Smart Grid Communications*, Vancouver, October 21-24.

S. Cano-Andrade, M.R. von Spakovsky, A. Fuentes, C. Lo Prete, B.F. Hobbs*** and L. Mili (2012). “Multi-objective optimization for the sustainable-resilient synthesis/design/operation of a power network coupled to distributed power producers via microgrids”. *Proceedings of ASME International Mechanical Engineering Congress and Exposition*, vol. 6, Energy: Sustainable Technologies, Houston, TX, November 9-15.

Research reports to sponsors

A. Kleit, C. Lo Prete, S. Blumsack, N. Guo* and K. Yoo (2014). “Weather or not? Welfare impacts of natural gas pipeline expansion in the Northeastern U.S.” *Report to Williams Company*, 1-46.

S. Blumsack, C. Lo Prete, U.V. Shanbhag and M. Webster (2018). Analysis of State Policy Interactions with Electricity Markets in the Context of Uneconomic Existing Resources: a Critical Assessment of the Literature. *Report to PJM Interconnection*, 1-53.

MANUSCRIPTS UNDER REVISION

“Capacity Markets vs. “Energy Only” Markets with Improved Scarcity Pricing under Increasing Wind Penetration”, with C. Hohl*.

WORK IN PROGRESS

“Grid reliability and competing claims for scarce natural gas during winter storms”, with A. Radhakrishnan*.

“Time for a market upgrade? A review of wholesale electricity market designs for the future”, with K. Palmer and M. Robertson.

“Comparing multi-settlement market designs for wind integration: an experimental study”, with C. Hohl*, J. Wu*, A. Kwasnica, R. Rong and F. Zhu.

“Comparing designs for resource adequacy in laboratory electricity markets”, with J. Wu*, R. Rong B. Ünél and F. Zhu.

“Enhancing energy adequacy in wholesale electricity markets: comparing forward energy contracts and capacity markets”, with J. Wang*.

FUNDED RESEARCH

C. Lo Prete. SH₂INE: Sustainable, Holistic Hydrogen INtegration Evaluation: models and analyses of human, environmental and policy dimensions. National Science Foundation. Role: PI. Total awarded: \$999,628. (Funded: September 01, 2024 – August 31, 2027. In collaboration with J. Dunn and K. Suiseeya, Northwestern University; Z. Guo, University of Central Florida, and H. Wiseman, Penn State).

C. Lo Prete. SAI: Strengthening energy infrastructure resilience and equity during extreme cold weather events. National Science Foundation. Role: PI. Total awarded: \$750,000. (Funded: September 15, 2023 – August 31, 2026. In collaboration with A. Dubey, Washington State University; B. Ünel, Institute for Policy Integrity at NYU, and C. Mason, University of Wyoming).

C. Lo Prete. Geopolitics of electricity and the weaponization of electricity trade. Center for Security Research and Education at Penn State. Role: PI. Total awarded: \$30,000. (Funded: September 1, 2023 – June 30, 2025. In collaboration with A.M. Jaffe, New York University; S. Fang and T. Loch-Temzelides, Rice University).

C. Lo Prete. A novel approach for estimating residential customer benefits from avoiding long-duration power interruptions. Center for Security Research and Education at Penn State. Role: PI. Total awarded: \$15,000. (Funded: January 1, 2022 – December 31, 2022. In collaboration with D. Brent, Penn State, and B. Leibowicz, University of Texas at Austin).

C. Lo Prete. CAREER: Capacity adequacy options for electricity markets with increasing renewable penetration: equilibrium models and laboratory experiments. National Science Foundation. Role: PI. Total awarded: \$500,000. (Funded: March 01, 2020 – February 28, 2025).

C. Lo Prete. Electricity market structure, wind penetration and information aggregation. Alfred P. Sloan Foundation. Role: PI. Total awarded: \$250,000. (Funded: November 8, 2018 - May 31, 2022. In collaboration with M. Webster and A. Kwasnica, Penn State).

C. Lo Prete. CRISP 2.0 Type 1: Economic mechanisms for grid resilience against extreme events and natural gas disruptions. National Science Foundation. Role: PI. Total awarded: \$250,000. (Funded: September 1, 2018 - August 31, 2022. In collaboration with D. Kirschen and B. Zhang, University of Washington; total awarded for the collaborative grant: \$750,000).

S. Blumsack, C. Lo Prete, U.V. Shanbhag, M. Webster. Analysis of state policy interactions with electricity markets in the context of uneconomic existing resources. PJM Interconnection, L.L.C. Role: Co-PI. Total awarded: \$75,144. (Funded: October 9, 2017 - October 31, 2018).

S. Blumsack, C. Lo Prete, N.R. Chaudhuri. Smart traction systems for weak power grids. Penn State Institutes for Energy and the Environment. Role: Co-PI. Total awarded: \$25,000. (Funded: September 1, 2017 - August 31, 2018).

C. Lo Prete. Complementarity-based equilibrium models for the analysis of market power in electric distribution networks. E. Willard and Ruby S. Miller Faculty Fellowship, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$50,000. (Funded: September 1, 2016 - August 31, 2018).

C. Lo Prete. Understanding the impacts of water scarcity on the evolution of the U.S. power system. Gladys Snyder Grant Program, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$10,000. (Funded: January 20, 2017 - December 31, 2017).

C. Lo Prete. Market design and price formation in electric distribution networks deploying energy and demand resources. Penn State Institutes for Energy and the Environment. Role: PI. Total awarded: \$25,000. (Funded: September 1, 2015 - August 31, 2016. In collaboration with M. Webster and U.V. Shanbhag at Penn State).

C. Lo Prete. Theory and models of price manipulation through uneconomic bidding in wholesale electricity markets. Wilson Research Initiation Grant, College of Earth and Mineral Sciences. Role: PI. Total awarded: \$10,000. (Funded: July 1, 2015 - June 30, 2016).

A. Kleit, S. Blumsack and C. Lo Prete. The economic impacts of expanding the Transco pipeline. Williams Company. Role: Co-PI. Total awarded: \$91,044. (Funded: May 1, 2014 - July 31, 2014).

CONFERENCE AND WORKSHOP PRESENTATIONS

- 2024: Penn State Workshop on the Geopolitics of Electricity (Event organizer and speaker)
University of Tennessee at Knoxville (Invited)
Atlantic Council (Invited)
Jenner Energy Conference (Invited)
Informs 2024 Annual Energy Conference
- 2023: College of Earth and Mineral Sciences Panel on the Energy Transition (Invited)
Resources For the Future workshop on “Reforming Resource Adequacy Practices and Ensuring Reliability in the Clean Energy Transition” (Invited)
NYU panel on “The Crisis in Ukraine: Geopolitics of Energy in Year One and Beyond” (Invited)
The Doorstep (Invited)
IEEE Power & Energy Society General Meeting (Invited)
Resources for the Future “Friends of RFF seminar” (Invited)
40th USAEE/IAEE North American Conference, Chicago, IL
Johns Hopkins School of Advanced International Studies (Invited)
Center for Strategic and International Studies (Invited)
- 2022: Institute for Policy Integrity (Invited)
Critical Infrastructure Protection Workshop, session on “Regulating and Managing Energy Infrastructure Interdependencies” (Organizer and Moderator)
Columbia University, Department of Earth and Environmental Engineering (Invited)
Boise University, Energy Policy Institute (Invited)
ISO New England (Invited)
43rd IAEE International Conference
39th USAEE/IAEE North American Conference, Houston, TX
Energy Insights 2022 (Invited)
- 2021: IEEE PESGM (Invited)
- 2020: Hawaii International Conference on System Sciences (HICSS-53), Maui, HI
University of Maryland, School of Public Policy (Invited)
39th Annual Eastern Conference, Shawnee-on-Delaware, PA
- 2019: Sandia National Laboratories, Albuquerque, NM (Invited)
Lehigh University, Department of Economics (Invited)
Ohio State University, Department of Integrated Systems Engineering (Invited)
37th USAEE/IAEE North American Conference, Denver, CO
EMbeDS 2019 Workshop, Pisa, Italy (Invited)

- 2018: Centro de Investigación y Docencia Económicas (CIDE), Mexico City (Invited)
Purdue University, Department of Industrial Engineering (Invited)
University of Texas at Austin, Department of Electrical Engineering (Invited)
Harvard University, Kennedy School of Government (Invited)
IEEE Power & Energy Society General Meeting, Portland, OR
11th International Workshop on Empirical Methods in Energy Economics, Milan, Italy
36th USAEE/IAEE North American Conference, Washington DC
- 2017: 35th USAEE/IAEE North American Conference, Houston, TX
10th International Workshop on Empirical Methods in Energy Economics, Los Angeles, CA
36th Annual Eastern Conference, Annapolis, MD
- 2016: 86th Annual Meetings of the Southern Economic Association, Washington, D.C. (Invited)
34th USAEE/IAEE North American Conference, Tulsa, OK
35th Annual Eastern Conference, Shawnee-on-Delaware, PA
West Virginia University, Department of Economics (Invited)
- 2015: 33rd USAEE/IAEE North American Conference, Pittsburgh, PA
- 2014: 37th IAEE International Conference, New York, NY
INFORMS Annual Meeting, San Francisco, CA
- 2013: 11th Annual International Industrial Organization Conference, Boston, MA
6th International Workshop on Empirical Methods in Energy Economics, Ottawa
4th IEEE International Conference on Smart Grid Communications, Vancouver
Annual Trans-Atlantic Infraday Conference, Washington D.C.
- 2012: American Economic Association Annual Meeting, Chicago, IL
- 2011: INFORMS Annual Meeting, Charlotte, NC
4th International Workshop on Empirical Methods in Energy Economics, Dallas, TX
- 2010: ECOS 2010 Conference, Lausanne
Annual Trans-Atlantic Infraday Conference, Washington D.C.

SUPERVISION OF PH.D. DISSERTATIONS

- Nongchao Guo (Ph.D., Department of Energy and Mineral Engineering) (July 2014 – July 2018).
- Cody Hohl (Ph.D., Department of Energy and Mineral Engineering) (September 2015 – December 2022).
- Ashish Radhakrishnan (Ph.D., Department of Energy and Mineral Engineering) (September 2019 - Present).
- Jiaying Wu (Ph.D., Energy, Environmental and Food Economics) (September 2021 - Present).
- Jingzhou Wang (Ph.D., Energy, Environmental and Food Economics) (September 2022 - Present).

UNIVERSITY SERVICE

- Associate Head for Diversity, Equity and Inclusion (Department of Energy and Mineral Engineering, Penn State)
- Undergraduate Program Chair for the Energy, Business and Finance program (Department of Energy and Mineral Engineering, Penn State)
- Doctoral oral examination committee member (Department of Industrial Engineering, Department of Computer Science and Engineering, and Department of Energy and Mineral Engineering, Penn State)
- Master's thesis committee member (Department of Energy and Mineral Engineering, Penn State)

- Ph.D. candidacy committee member (Department of Energy and Mineral Engineering, Penn State)
- Member of the EME Graduate Programs Committee
- Member of the EME Executive Council

PROFESSIONAL SERVICE AND OUTREACH

- Editorial Board Member, Economics of Energy & Environmental Policy
- Co-Editor of the Symposium “Energy transformation, social inclusion, and economic prosperity in Latin America”, Economics of Energy & Environmental Policy
- Co-Editor of the Symposium “What happened in Texas? Understanding the February 2021 black-outs and learning lessons to prepare the grid for extreme weather events”, Economics of Energy & Environmental Policy
- Editor of the “Contemporary Energy Issues in Europe” section, Current Sustainable/Renewable Energy Reports
- Reviewer of grant proposals for ARPA-E and the National Science Foundation
- Referee for The Energy Journal, IEEE Transactions on Power Systems, Energy Economics, Networks and Spatial Economics, Energy Policy, Energy, IIE Transactions, Energy Engineering
- Harvard Electricity Policy Group
- Austin Electricity Conference, University of Texas at Austin

PROFESSIONAL AFFILIATIONS

Member, Energy Systems Integration Group (ESIG)
 Member, International Association of Energy Economists (IAEE)
 Member, U.S. Association of Energy Economists (USAEE)
 Member, American Economic Association (AEA)