

Christoph Graf

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Experience

- 2022–
 - 📌 **New York University**, Institute for Policy Integrity. Senior Economist/Research Scholar.
 - 📌 **Stanford University**, Program on Energy and Sustainable Development (PESD). Research Affiliate.
- 2026
 - 📌 **Columbia University**, School of International and Public Affairs. Lecturer (Fall Semester).
 - 📌 **Stanford University**, Department of Economics. Lecturer (Winter Quarter).
- 2021–2022
 - 📌 **Stanford University**, Program on Energy and Sustainable Development (PESD). Social Science Research Scholar.
- 2019–2021
 - 📌 **Stanford University**, Department of Economics. Postdoctoral Research Fellow.
- 2017–2019
 - 📌 **University of California, Berkeley**, Department of Industrial Engineering and Operations Research. Postdoctoral Scholar.
- 2015–2017
 - 📌 **Vienna University of Economics and Business**, Research Institute for Regulatory Economics. Research and Teaching Associate.
- 2014–2015
 - 📌 **European University Institute**, Florence School of Regulation-Climate. Research Associate.

Education

- 2014
 - 📌 **Ph.D., University of Vienna**, Management.
- 2010
 - 📌 **Diploma, University of Vienna**, Economics.

Research Interests

Energy Transition; Market Design; Electricity Systems; Public Policy; Energy and Environmental Economics; Climate Change; Machine Learning; Optimization; Industrial Organization

Awards and Grants

- 2026
 - 📌 NYU Climate Research Seed Award for “A Viable Path to Decarbonize New York City’s Buildings,” with D. Mallapragada, \$20 000.
 - 📌 NYU Goddard Impact Award “Managing Bits for Cheaper Watts: Computational Modeling, Policy, and Market Design for Grid-Responsive Data Centers,” with D. Mallapragada (Lead PI), L. Subramanian, and R. Revesz, \$15 000.
 - 📌 Future of Heat Initiative (FoHI) Academic Research Funding “Coordinated Gas and Electric Distribution Infrastructure Planning in NYC,” with D. Mallapragada, \$10 000.
- 2024
 - 📌 NYU Climate Change Initiative Seed Grant for “Emissions Accounting to Accelerate Electric Sector Decarbonization” Conference, with B. Ünel (Lead PI) and D. Mallapragada, \$10 000.
- 2019
 - 📌 Austrian National Bank (OeNB) Research Grant, “A deep Q-learning approach on bidding in wholesale electricity markets,” Award number 18306, with C. Klöckl (Lead PI), €123 000.
- 2016
 - 📌 Erwin Schrödinger Fellowship awarded by Austrian Science Fund (FWF), “Merits and Limitations of Economic Dispatch Models,” Project number J-3917, €161 110.
- 2014
 - 📌 Doc.Award for PhD thesis (City of Vienna, Department of Cultural Affairs–Science).
 - 📌 PhD thesis Award, Austrian Society of Operations Research (OeGOR).

Awards and Grants (continued)

- Short-term grant supporting a 4-month stay at Imperial College London (Advisor: Richard Green), University of Vienna.
- 2009 ■ Scholarship for Erasmus exchange program (6 months) at University of Alicante (Spain).
- 2008–2010 ■ Prize for academic excellence (Leistungsstipendium), University of Vienna.

Research

Working Papers

- 1 L. Cantoni, V. Catalano, **C. Graf**, F. Quaglia, A. Terracciano, and F. A. Wolak, “Under the Hood: Penalty Parameters for System Constraint Violations in Short-Term Wholesale Electricity Market-Clearing Mechanisms,” Working Paper, 2026. [URL: https://fawolak.org/pdf/market_clearing_penalty_parameters.pdf](https://fawolak.org/pdf/market_clearing_penalty_parameters.pdf).
- 2 D. Daví-Arderius and **C. Graf**, “Iberian Peninsula Blackout: A Trade-Off Between Operational Risk and Consumer Cost,” Working Paper, 2025. [DOI: 10.2139/ssrn.5429395](https://ssrn.com/abstract=5429395).
- 3 M. Domeshek, **C. Graf**, and B. Ünel, “Coordinated vs. Sequential Transmission Planning,” Working Paper, 2025. [DOI: 10.48550/arXiv.2509.24959](https://arxiv.org/abs/2509.24959).
- 4 **C. Graf**, E. La Pera, F. Quaglia, and F. A. Wolak, “Market Power Mitigation Mechanisms for Wholesale Electricity Markets: Status Quo and Challenges,” Working Paper, 2021. [URL: https://web.stanford.edu/group/fwolak/cgi-bin/sites/default/files/MPM_Review_GPQW.pdf](https://web.stanford.edu/group/fwolak/cgi-bin/sites/default/files/MPM_Review_GPQW.pdf).
- 5 **C. Graf**, F. Quaglia, and F. A. Wolak, “Market Performance Assessment in Locational Markets with Non-convexities,” Working Paper, 2020. [URL: https://web.stanford.edu/group/fwolak/cgi-bin/sites/default/files/NonConvexBenchmark_0.pdf](https://web.stanford.edu/group/fwolak/cgi-bin/sites/default/files/NonConvexBenchmark_0.pdf).
- 6 **C. Graf**, F. Quaglia, and F. A. Wolak, “Simplified Electricity Market Models with Significant Intermittent Renewable Capacity: Evidence from Italy,” National Bureau of Economic Research, NBER Working Paper 27262, 2020. [URL: http://www.nber.org/papers/w27262](http://www.nber.org/papers/w27262).

Journal Articles

- 1 **C. Graf** and F. A. Wolak, “Measuring Market Power in Network-Constrained Markets,” *The RAND Journal of Economics*, forthcoming. [URL: https://www.nber.org/papers/w34272](https://www.nber.org/papers/w34272).
- 2 Z. Zhou, **C. Graf**, and Y. Dvorkin, “Unlocking Transmission Flexibility under Uncertainty: Getting Dynamic Line Ratings into Electricity Markets,” *IEEE Transactions on Energy Markets, Policy, and Regulation*, forthcoming. [DOI: 10.1109/TEMPR.2025.3636820](https://doi.org/10.1109/TEMPR.2025.3636820).
- 3 **C. Graf**, “Simplified Short-Term Electricity Market Designs: Evidence from Europe,” *The Electricity Journal*, vol. 39, p. 107486, 1 2026. [DOI: 10.1016/j.tej.2025.107486](https://doi.org/10.1016/j.tej.2025.107486).
- 4 **C. Graf**, C. Holt, and B. Ünel, “Cost-Effective Capacity Markets,” *The Energy Journal*, vol. 47, no. 1, pp. 45–76, 2026. [DOI: 10.1177/01956574251379783](https://doi.org/10.1177/01956574251379783).
- 5 S. Khanal, **C. Graf**, Z. Liang, Y. Dvorkin, and B. Ünel, “Multi-objective transmission expansion: An offshore wind power integration case study,” *IEEE Transactions on Energy Markets, Policy, and Regulation*, pp. 519–535, 2024. [DOI: 10.1109/TEMPR.2024.3390760](https://doi.org/10.1109/TEMPR.2024.3390760).
- 6 **C. Graf**, T. Kuppelwieser, and D. Wozabal, “Frequent Auctions for Intraday Electricity Markets,” *The Energy Journal*, vol. 45, no. 1, pp. 231–256, 2024. [DOI: 10.5547/01956574.45.1.cgra](https://doi.org/10.5547/01956574.45.1.cgra).
- 7 **C. Graf**, V. Zobernig, J. Schmidt, and C. Klöckl, “Computational Performance of Deep Reinforcement Learning to Find Nash Equilibria,” *Computational Economics*, vol. 63, pp. 529–576, 2024. [DOI: 10.1007/s10614-022-10351-6](https://doi.org/10.1007/s10614-022-10351-6).
- 8 **C. Graf**, J. Rosselló-Nadal, and A. Sansó-Rosselló, “Is Daylight Saving Time worth it in tourist regions?” *Tourism Management Perspectives*, vol. 45, p. 101068, 2023. [DOI: 10.1016/j.tmp.2022.101068](https://doi.org/10.1016/j.tmp.2022.101068).

- 9 C. Graf, F. Quaglia, and F. A. Wolak, "(Machine) learning from the COVID-19 lockdown about electricity market performance with a large share of renewables," *Journal of Environmental Economics and Management*, vol. 105, p. 102398, 2021. [DOI: 10.1016/j.jeem.2020.102398](#).
- 10 S. F. Verde, C. Graf, and T. Jong, "Installation entries and exits in the EU ETS: Patterns and the delay effect of closure provisions," *Energy Economics*, vol. 84, pp. 508–524, 2019. [DOI: 10.1016/j.eneco.2018.11.032](#).
- 11 C. Graf and C. Marcantonini, "Renewable energy and its impact on thermal generation," *Energy Economics*, vol. 66, pp. 421–430, 2017. [DOI: 10.1016/j.eneco.2017.07.009](#).
- 12 D. Wozabal, C. Graf, and D. Hirschmann, "The effect of intermittent renewables on the electricity price variance," *OR Spectrum*, vol. 38, no. 3, pp. 687–709, 2016. [DOI: 10.1007/s00291-015-0395-x](#).
- 13 C. Graf and F. Wirl, "Corporate social responsibility: A strategic and profitable response to entry?" *Journal of Business Economics*, vol. 84, no. 7, pp. 917–927, 2014. [DOI: 10.1007/s11573-014-0739-z](#).
- 14 C. Graf and M. Six, "The effect of information on the quality of decisions," *Central European Journal of Operations Research*, vol. 22, pp. 647–662, 4 2014. [DOI: 10.1007/s10100-013-0291-x](#).
- 15 C. Graf and D. Wozabal, "Measuring competitiveness of the EPEX spot market for electricity," *Energy Policy*, vol. 62, pp. 948–958, 2013. [DOI: 10.1016/j.enpol.2013.07.052](#).
- 16 C. Graf, R. Vetschera, and Y. Zhang, "Parameters of social preference functions: Measurement and external validity," *Theory and Decision*, vol. 74, no. 3, pp. 357–382, 2013. [DOI: 10.1007/s11238-012-9312-9](#).

Conference Proceedings

- 1 A. Ortner and C. Graf, "Multi-market unit-commitment and capacity reserve prices in systems with a large share of hydro power: A case study," in *10th International Conference on the European Energy Market (EEM)*, 2013, pp. 1–8. [DOI: 10.1109/EEM.2013.6607336](#).

Books and Chapters

- 1 D. Wozabal, C. Graf, and D. Hirschmann, "Renewable Energy and Its Impact on Power Markets," in *Handbook of Risk Management in Energy Production and Trading*, ser. International Series in Operations Research & Management Science, R. M. Kovacevic, G. C. Pflug, and M. T. Vespucci, Eds., vol. 199, Springer US, 2013, pp. 283–311. [DOI: 10.1007/978-1-4614-9035-7_12](#).

Selected Policy Work

- 2026  "Co-optimization Models for Transmission Planning: Legal Foundations Under the Federal Power Act," Research Report
 "Drivers of Transmission: Examining Demand Growth and State Clean Energy Policies," Issue Brief
 Comments on the GHG Protocol Scope 2 Public Consultation
 Market-Based Methods in Greenhouse Gas Accounting (Webinar moderation)

Selected Policy Work (continued)

- 2025 ■ “The Myth of ‘Baseload’ Power in Modern Power Grids,” Report
“Enough Energy: A Review of DOE’s Resource Adequacy Methodology,” Report
Comments to EIA on BlueSky Prototype Model
Comments to New York Public Service Commission on New York Clean Energy Standard
Comments to New York Public Service Commission on New York Zero Emission Credits
Energy Systems Integration Group (ESIG), FERC Order 1920 Task Force, Member
Power Perspectives, Podcast on Capacity Markets
Advancing Offshore Wind Transmission at Global Transmission Report’s 5th Annual Transmission Infrastructure U.S. conference (Panel moderation)
Transmission Planning Under Uncertainty—PJM State Participation in Order 1920 Scenario Development (Webinar)
- 2024 ■ “Guide to State Participation in PJM Long-Term Scenario Development Under FERC Order No. 1920,” Report
Public Comments to EPA on Request for Input on Reducing Greenhouse Gas Emissions from Existing Fossil-Fuel-Fired Stationary Combustion Turbines
Stakeholder Feedback on Policy-Driven Retirements to PJM’s Transmission Expansion Advisory Committee Special Session on Order No. 1920
Stakeholder Feedback on Corporate Commitments to PJM’s Transmission Expansion Advisory Committee Special Session on Order No. 1920
Voluntary Carbon Markets: Is Skepticism Justified? (Webinar moderation)
Electric Transmission and the Energy Transition: Perspectives from Africa, Europe, and North America (Webinar moderation)
Modeling the Energy Transition (Webinar moderation)
- 2023 ■ “Transmission Planning for the Energy Transition: Rethinking Modeling Approaches,” Report
Public Comments to FERC in Support of Technical Conference on Capacity Accreditation, Public Comments to PJM on the Resource Adequacy Critical Issue Fast Path
Public Comments to DOE on National Interest Electric Transmission Corridors, Public Comments to FERC on its Backstop Siting Authority
Public Comments to NY Public Service Commission on Energy Storage Roadmap
Critical Raw Materials, Industrial Policy, and the Energy Transition (Webinar moderation)
- 2022 ■ Public Comments to PUCT on Wholesale Electricity Market Design
Public Comments to FERC on Transmission NOPR

Selected Talks and Presentations

- 2026 ■ Lehigh University, Universitat de Barcelona, ASSA Annual Meeting, XIV International Academic Symposium (IEB, Barcelona), POWER Conference on Energy Research and Policy (UC Berkeley), 15th Energy and Climate Economics Conference (Toulouse), IFORS (University of Vienna), INFORMS Annual Meeting (anticipated)
- 2025 ■ INFORMS Annual Meeting, APPAM Fall Research Conference, Energy Days 2025 (Prague), The New York Academy of Sciences Symposium on Mesoscale Weather Risk, NYU-Princeton Workshop on Future Electricity Grids and Energy Markets with Decarbonization (NYU), Austin Electricity Conference (UT Austin)
New Jersey Board of Public Utilities Technical Conference on Resource Adequacy, 5th Annual Conference Transmission Infrastructure U.S., PJM Stakeholder Meeting
- 2024 ■ Market Design to Support a Low-Cost and Reliable Energy Transition (Monash University), Sustainable Energy Transition (IFN, Stockholm), International Conference on Modelling and Managing Energy Risks (University of Modena), IAAE International Conference (Istanbul)
New England Conference of Public Utilities Commissioners, Independent Electric System Operator NY (NYISO), National Energy System Operator (GB System Operator), PJM Stakeholder Presentation on FERC Order 1920

Selected Talks and Presentations (continued)

- 2023  IAEE European Conference, Seminar Presentation at Johns Hopkins University (EHE)
OFGEM (UK Energy Regulator), PJM Interconnection
- 2022  NBER Industrial Organization Program Meeting, Conference on The Economics of Energy Markets and Energy Access, University of Chicago (EPIC), Toulouse Conference on The Economics of Energy and Climate, ASSA Annual Meeting (Paper Session, Public Utilities), Mannheim Energy Conference, Italian transmission system operator (Terna), Bocconi (GREEN), Mines Paristech (CERNA)
- 2021  ASSA Annual Meeting (Paper Session, Public Utilities), Annual Conference of the Mannheim Centre for Competition and Innovation (MaCCI), Mannheim Energy Conference
Italian Transmission System Operator (Terna)
- 2020  Italian Regulatory Authority for Energy, Networks, and the Environment (ARERA)
- 2018  European Conference on Operational Research (EURO), Universitat de València and Universitat Politècnica de València
Italian Regulatory Authority for Energy, Networks and the Environment (ARERA)
- 2017  Mannheim Energy Conference, Workshop in Economics of Environment, Energy and Climate at Peking University, Renmin University of China, University of California, Berkeley, 7th Atlantic Workshop on Energy and Environmental Economics, Mannheim Energy Conference, Robert Schuman Centre for Advanced Studies (RSCAS) Seminar Series: Economic Implication of Climate Policies, Italian Association of Environmental and Resource Economists (IAERE), Italian Association of Environmental and Resource Economists (AIEE) Energy Symposium
- 2015  Italian Association of Environmental and Resource Economists (IAERE), Florence School of Regulation-Climate, Annual Conference
- 2014  IAEE International Conference (New York), International Conference on Computational Management Science
- 2013  International Conference on the European Energy Market, Mannheim Energy Conference, Workshop on Energy and CO2 Markets (University of Valencia), Cologne International Energy Summer (CIES)
- 2012  International Conference on the European Energy Market, Mannheim Energy Conference, Austrian Workshop on Empirical Industrial Organization at Austrian Institute of Economic Research (WIFO), Centre for Competition and Regulatory Policy (CCRP) Workshop at Vienna University of Economics and Business
- 2011  Game Theory and Society Conference (ETH Zurich), International Conference on Computational Management Science
E-Control (Austrian Energy Regulator)

Teaching

- 2026  Environmental Economics, Columbia SIPA
-  Team Teaching Course on Energy Markets and Environmental Policy with Alexandre Street and Frank A. Wolak, Master's Degree level, Stanford University
- 2024  Guest Lecture, Energy Law Regulation and Policy, New York University School of Law
- 2019  Game theory in Environmental and Natural Resource Management, MSc Course for Environmental Engineering students, University of Natural Resources and Life Sciences, Vienna
- 2016  Applied Microeconomics, BSc Course for Business and Economics Students, Vienna University of Economics and Business
- 2012, 2015  Applied International Environmental Management, MSc Course for Business Students, University of Vienna
- 2011–2014  Firms and Competition, MSc Course for Business Students, University of Vienna

Academic Service

Referee Service

Applied Economics; Applied Energy; Economics Letters; Energy Economics; Energy Journal; Energy Policy; European Journal of Operations Research; IEEE Transactions on Energy Markets, Policy, and Regulation; IEEE Transactions on Power Systems; Journal of the European Economic Association; Nature Energy; OR Spectrum; RAND Journal of Economics; Science; Utilities Policy

Conference Organizing & Committees

- 2026  IFORS, Energy Stream Organizer; INFORMS, ENRE Award Committee
- 2025  INFORMS, Session Organizer, ENRE Award Committee
- 2024  NYU, Policy Integrity Annual Conference Organizer

Miscellaneous

- 2026  Eclectric, Annual Convening of interdisciplinary energy transition researchers in New York, Co-Founder
- 2025, 2026  NYU Policy Integrity Seminar Series, Organizer
- 2023–2025  NYU Policy Integrity Recruiting Committee, Member

New York, July, 2026.