

October 19th, 2020

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C. Anna Spurlock

Doctoral Studies:

University of California, Berkeley: Ph.D., Agricultural and Resource Economics - May 17th, 2013

Dissertation Title: *Essays in Energy Economics*

Primary Field: Energy and Environmental Economics

Secondary Fields: Psychology and Economics (Behavioral Economics), Applied Econometrics

Pre-Doctoral Studies:

University of California, Berkeley: M.S., Agricultural and Resource Economics - December 2009

University of California, Santa Cruz: B.A., Anthropology - December 2002

Research and Work Experience:

May 2019-present Research Scientist, Energy Analysis and Environmental Impacts Division,
Lawrence Berkeley National Laboratory (LBNL)

July 2013-May 2019 Senior/Principal Scientific Engineering Associate, Energy Efficiency Standards
Group, Electricity Market and Policy Group, and Sustainable Transportation
Initiative, Lawrence Berkeley National Laboratory

July 2012-July 2013 Graduate Student Researcher, Energy Efficiency Standards Group, LBNL

Sept. 2009-Sept. 2011 Intermittent work as a Graduate Student Researcher under Dr. Peter Berck and
Dr. Maximilian Auffhammer, Agricultural and Resource Economics Dept., UC
Berkeley

June-Sept. 2009 Consultant, Yemeni Social Fund for Development (SFD), Sana'a, Yemen in
support of the collaborative World Bank-SFD project, "Assessing local
communities and household resilience to adapt to climate change in rain-fed
areas of Yemen"

Published Peer-Reviewed Journal Articles:

Jin, Ling, Alina Lazar, James Sears, Annika Todd, Alexander Sim, Keshang Wu, Hung-Chia Yang, C. Anna Spurlock. Forthcoming. "Life Course as a Contextual System to Investigate the Effects of Life Events, Gender, and Generation on Travel Mode Use." *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2020.3032328>. Role: Principal Investigator.

Spurlock, C. Anna, Annika Todd, Gabrielle Wong-Parodi, Victor Walker. 2020. "Children, Income, and the Impact of Home-Delivery on Household Shopping Trips." *Transportation Research Record*. DOI: <https://doi.org/10.1177/0361198120935113>. Role: Principal Investigator and lead author.

- Todd-Blick, Annika, **C. Anna Spurlock**, Ling Jin, Sam Borgeson, Peter Cappers, Daniel Fredman, Jarett Zuboy. 2020. “Winners are not keepers: Characterizing household engagement, gains, and energy patterns in demand response using machine learning.” *Energy Research & Social Science* 70, 101595. DOI: <https://doi.org/10.1016/j.erss.2020.101595>. Role: Co-Principal Investigator.
- Todd, Annika, Peter Cappers, **C. Anna Spurlock** and Ling Jin. 2019. “Spillover as a Cause of Bias in Baseline Evaluation Methods for Demand Response Programs.” *Applied Energy*, 250, 344-357. DOI: <https://doi.org/10.1016/j.apenergy.2019.05.050>. Role: Contributing author.
- Spurlock, C. Anna**, James Sears, Gabrielle Wong-Parodi, Victor Walker, Ling Jin, Margaret R. Taylor, Andrew Duvall, Anand Gopal, Annika Todd. 2019. “Describing the users: Understanding adoption of and interest in shared, electrified, and automated transportation in the San Francisco Bay Area.” *Transportation Research Part D*, 71, 283-301. DOI: <https://doi.org/10.1016/j.trd.2019.01.014>. Role: Principal Investigator and lead author.
- Lazar, Alina, Ling Jin, **C. Anna Spurlock**, Annika Todd, Kesheng Wu and Alex Sim. 2019. “Evaluating the Effects of Missing Values and Mixed Data Types on Social Sequence Clustering Using t-SNE Visualization.” *Journal of Data and Information Quality (JDIQ)* 11(2), 7. DOI: <https://doi.org/10.1145/3301294>. Role: Principal Investigator.
- Cappers, Peter, **C. Anna Spurlock**, Annika Todd and Ling Jin. 2018. “Are vulnerable customers any different than their peers when exposed to critical peak pricing: Evidence from the US.” *Energy Policy*, 123, 421-432. DOI: <https://doi.org/10.1016/j.enpol.2018.09.013>. Role: Contributing author.
- Kim, Taehoon, Jaesik Choi, Dongeun Lee, Alexander Sim, **C. Anna Spurlock**, Annika Todd, and Kesheng Wu. 2018. “Predicting Baseline for Analysis of Electricity Pricing,” *International Journal of Big Data Intelligence*. Special issue on Data to Decision. Vol.5, No.1/2, pp.3-20. DOI: <http://dx.doi.org/10.1504/IJBDI.2018.088269>. Role: Co-Principal Investigator.
- Houde, Sébastien, and **C. Anna Spurlock**. 2016. "Minimum Energy Efficiency Standards for Appliances: Old and New Economic Rationales." *Economics of Energy & Environmental Policy* 5.2. DOI: <https://doi.org/10.5547/2160-5890.5.2.shou>. Role: Contributing author.

Journal Articles Under Review:

- Wells, Emily, Mitchell Small, **C. Anna Spurlock**, Gabrielle Wong-Parodi. “Factors Influencing Emerging Multimodal Transportation Behavior in the San Francisco Bay Area.” (Under review at *Transportation Research Part A*). Role: Contributing Author.
- Popovich, Natalie, **C. Anna Spurlock**, Zachary Needell, Ling Jin, Tom Wenzel, Colin Sheppard, and Mona Asudegi. “A Methodology to Develop a Geospatial Transportation Typology.” (Revise and Resubmit – *Journal of Transportation Geography*). Role: Principal Investigator.
- Jin, Ling, **C. Anna Spurlock**, Sam Borgeson, Daniel Fredman, Annika Todd, Alina Lazar. “Capturing Variability Drivers in Energy Usage Patterns with Load Shape Clustering of Residential Smart Meter Data.” (Under review *International Journal of Energy Technology and Policy (IJETP)*). Role: Co-Principal Investigator.
- Taylor, Margaret, K. Sydney Fujita, Annika Todd, Yulei Shelley He, Victor Walker, Andrew Duvall, Gabrielle Wong-Parodi, Ling Jin, James Sears, Ted Kwasnik and **C. Anna Spurlock**. “The WholeTraveler Transportation Behavior Survey: Decision-Making Data related to Transportation Energy Use in the San Francisco Bay Area.” (Revise and Resubmit – *Transportation*). Role: Principal Investigator.
- Fowlie, Meredith, Catherine Wolfram, **C. Anna Spurlock**, Annika Todd, Patrick Baylis, and Peter Cappers. “Default Effects and Follow-On Behavior: Evidence from an Electricity Pricing Program” (Conditionally Accepted – *Review of Economic Studies*). Role: Contributing author.

Peer-Reviewed Conference Papers:

- Lazar, Alina, Alexandra Ballow, Ling Jin, **C. Anna Spurlock**, Alex Sim, and Kesheng Wu. 2019. "Machine Learning for Prediction of Mid to Long Term Habitual Transportation Mode Use." 2019 IEEE International Conference on Big Data. DOI: <https://doi.org/10.1109/BigData47090.2019.9006411>. Role: Principal Investigator.
- Lazar, Alina, Ling Jin, **C. Anna Spurlock**, Annika Todd, Kesheng Wu, Alex Sim. 2017. "Data Quality Challenges with Missing Values and Mixed Types in Joint Sequence Analysis." 2017 IEEE International Conference on Big Data. DOI: <https://doi.org/10.1109/BigData.2017.8258222>. Role: Principal Investigator.
- Jin, Ling, Doris Lee, Alex Sim, Sam Borgeson, John Wu, **C. Anna Spurlock**, Annika Todd. 2017. "Comparison of Clustering Techniques for Residential Energy Behavior using Smart Meter Data." 2nd Association for the Advancement of Artificial Intelligence (AAAI) Workshop on Smart Grid and Smart Buildings. <https://aaai.org/ocs/index.php/WS/AAAIW17/paper/view/15166>. Role: Co-Principal Investigator.
- Patel, Siddharth, Sam Borgeson, Ram Rajagopal, **C. Anna Spurlock**, Ling Jin, Annika Todd. 2016. "Time Will Tell: Using Smart Meter Time Series Data to Derive Household Features and Explain Heterogeneity in Pricing Programs" 2016 ACEEE Summer Study Conference Proceedings. https://aceee.org/files/proceedings/2016/data/papers/12_199.pdf. Role: Co-Principal Investigator.
- Baylis, Patrick, Peter Cappers, Ling Jin, **C. Anna Spurlock**, Annika Todd. 2016. "Go for the Silver? Evidence from field studies quantifying the difference in evaluation results between "gold standard" randomized controlled trial methods versus quasi-experimental methods." 2016 ACEEE Summer Study Conference Proceedings. https://aceee.org/files/proceedings/2016/data/papers/2_363.pdf. Role: Contributing author.
- Kim, Taehoon, Dongeun Lee, Jaesik Choi, Alex Sim, **C. Anna Spurlock**, Annika Todd, Kesheng Wu. 2015. "Extracting Baseline Electricity Usage with Gradient Tree Boosting." 2015 International Conference on Big Data Intelligence and Computing (DataCom 2015). DOI: <https://doi.org/10.1109/SmartCity.2015.156>. Role: Co-Principal Investigator.

Published Working Papers and Reports:

- Department of Energy. 2020. "SMART Mobility: Mobility Decision Science Capstone Report." Department of Energy Office of Energy Efficiency and Renewable Energy. https://www.energy.gov/sites/prod/files/2020/08/f77/SMART-MDS_Capstone_08.05.20.pdf. Role: Principal Investigator and lead author.
- Cappers, Peter, **C. Anna Spurlock**. 2020. "A Handbook for Designing, Implementing, and Evaluating Successful Pilots." LBNL Report. <https://eta.lbl.gov/publications/handbook-designing-implementing>. Role: Contributing author.
- Fowlie, Meredith, Catherine Wolfram, **C. Anna Spurlock**, Annika Todd, Patrick Baylis, and Peter Cappers. 2017. "Default Effects and Follow-On Behavior: Evidence from an Electricity Pricing Program." Working Paper No. w23553. National Bureau of Economic Research. DOI: 10.3386/w23553 <https://www.nber.org/papers/w23553>. Role: Contributing author.
- Cappers, Peter, **C. Anna Spurlock**, Annika Todd, Ling Jin. 2016. "Experiences of Vulnerable Residential Subpopulations with Critical Peak Pricing" LBNL Report No. LBNL-1006294. <https://emp.lbl.gov/publications/experiences-vulnerable-residential>. Role: Contributing author.
- Cappers, Peter, **C. Anna Spurlock**, Annika Todd, Patrick Baylis, Meredith Fowlie, Catherine Wolfram. 2016. "Time-of-Use as a Default Rate for Residential Customers: Issues and Insights" LBNL Report No. LBNL-1005704. <https://emp.lbl.gov/publications/time-use-default-rate-residential>. Role: Contributing author.

- Taylor, Margaret and **C. Anna Spurlock** and Hung-Chia Yang. 2015. “Confronting Regulatory Cost and Quality Expectations: An Exploration of Technical Change in Minimum Efficiency Performance Standards” Resources for the Future Working Paper DP 15-50. <http://www.rff.org/research/publications/confronting-regulatory-cost-and-quality-expectations-exploration-technical>. Role: Contributing author.
- Spurlock, C. Anna**. 2015. “Loss Aversion and Time-Differentiated Electricity Pricing” LBNL Report No. LBNL-182764. <https://eta.lbl.gov/publications/loss-aversion-time-differentiated>. Role: Lead author.
- Houde, Sebastien and **C. Anna Spurlock**. 2015. “Do Energy Efficiency Standards Improve Quality? Evidence from a Revealed Preference Approach” LBNL Report No. LBNL-182701. <https://eta.lbl.gov/publications/do-energy-efficiency-standards>. Role: Contributing author.
- Spurlock, C. Anna**. 2013. “Appliance Efficiency Standards and Price Discrimination.” LBNL Report No. LBNL-6283E. <https://eta.lbl.gov/publications/appliance-efficiency-standards-price>. Role: Lead author.
- Spurlock, C. Anna**, Hung-Chia Yang, Larry Dale. 2013. “Energy Efficiency and Minimum Standards: A Market Analysis of Recent Changes in Appliance Energy Efficiency Standards in the United States.” LBNL Report No. LBNL-6353E. <https://eta.lbl.gov/publications/energy-efficiency-minimum-standards>. Role: Lead author.

Grants:

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| 2020 | Department of Energy, Vehicle Technologies Office, EEMS Program, SMART Mobility: “SMART 2.0.” (Principal Investigator for LBNL’s contribution). |
| 2020 | Federal Highways Administration (FHWA) year 3 follow-on funding: “Geo-Economics Multi-Modal System Modeling.” (Principal Investigator) |
| 2018 | LBNL Early Career Development Laboratory Directed Research and Development (LDRD) second year follow-on funding: “A Neuroeconomics Experiment to Study Routine Transportation Decision-Making Processes and Drivers.” (Principal Investigator) |
| 2017 | LBNL Early Career Development Laboratory Directed Research and Development (LDRD): “A Neuroeconomics Experiment to Study Routine Transportation Decision-Making Processes and Drivers.” (Principal Investigator) |
| 2016 | Department of Energy, Vehicle Technologies Office, EEMS Program, SMART Mobility: “Mobility Decision Science.” (Initially LBNL Deputy Pillar Lead, then became Principal Investigator) |
| 2015 | LBNL Laboratory Directed Research and Development (LDRD) grant second year follow-on funding: “Behavior Analytics,” with Annika Todd. (Co-Principal Investigator) |
| 2014 | LBNL Laboratory Directed Research and Development (LDRD) grant: “Behavior Analytics,” with Annika Todd. (Co-Principal Investigator) |
| 2013 | Resources for the Future Regulatory Performance Initiative Proposal: “Accounting for Innovation in Regulatory Impact Analyses,” with Margaret Taylor. (Senior research contributor) |

Awards, Honors, and Fellowships:

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| 2018 | Director’s Award for Exceptional Achievement – Diversity, Lawrence Berkeley National Laboratory |
| 2017 | SPOT Award, Lawrence Berkeley National Laboratory, “Anna working in collaboration with ETA staff Corrine Scown and Sr. HRDP, Leticia Ericson |

identified an effective, but not well understood mechanism for providing compensation to women employees while on maternity leave.”

- 2017 2017 Kevin McCauley Memorial Outstanding Staff Award, Council of UC Staff Assemblies (CUCSA). For exceptional efforts engaging staff and leadership on diversity & inclusion efforts.
- 2016 SPOT Award, Lawrence Berkeley National Laboratory, “C. Anna Spurlock has substantively contributed to promoting a more inclusive and diverse workplace environment through her many efforts as the EAEI representative on the ETA Diversity and Inclusion Council”
- 2015 Best Paper Award at 2015 International Conference on Big Data Intelligence and Computing (DataCom 2015) for “Extracting Baseline Electricity Usage with Gradient Tree Boosting”, with Kim, Taehoon, Dongeun Lee, Jaesik Choi, Alex Sim, Annika Todd, Kesheng Wu.
- 2013 Outstanding Graduate Student Instructor Award, UC Berkeley
- 2012 & 2010 Precourt Energy Efficiency Center Fellow, BECC Conference
- 2007-2009 Foreign Language and Area Studies Fellowship (Arabic), UC Berkeley
- 2002 College Honors, UC Santa Cruz

Presentations, Conferences & Webinars:

- June 2020 2020 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review and Peer Evaluation Meeting: “WholeTraveler Transportation Behavior Study.”
- January 2020 Transportation Review Board (TRB) Annual Meeting 2020: “Children, Income, and the Impact of Home-Delivery on Household Shopping Trips,” work joint with Annika Todd, Gabrielle Wong-Parodi, and Victor Walker (poster)
- January 2020 Transportation Review Board (TRB) Annual Meeting 2020: “What will happen to mass transit use if the price of ride hailing falls? Insights from the WholeTraveler Transportation Behavior Study,” work joint with Annika A. Todd, and Saika Belal (poster)
- November 2019 Behavior Energy and Climate Change (BECC) 2019: “Children, Income, and the Impact of Home-Delivery on Household Shopping Trips,” work joint with Annika Todd, Gabrielle Wong-Parodi, Victor Walker
- June 2019 2019 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review and Peer Evaluation Meeting: “WholeTraveler Transportation Behavior Study.”
- June 2018 2018 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review and Peer Evaluation Meeting: “WholeTraveler Survey on Life Trajectories and Mobility Decisions.”
- October 2017 Behavior Energy and Climate Change (BECC) 2017: “Understanding the Whole Traveler in an Era of Rapid Transportation Innovation,” (Poster)
- June 2017 2017 DOE Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review and Peer Evaluation Meeting: “WholeTraveler Survey on Life Trajectories and Mobility Decisions.” (Poster)
- September 2016 Energy Efficiency EM&V Webinar Series: “Evaluation of Residential Behavior-Based Programs”
- October 2016 Behavior Energy and Climate Change (BECC) 2016: “Go for the Silver? Evidence from field studies quantifying the difference in evaluation results between “gold standard” randomized controlled trial methods versus quasi-

	experimental methods,” work joint with Baylis, Patrick, Peter Cappers, Ling Jin, Annika Todd.
August 2016	ACEEE Summer Study: “Go for the Silver? Evidence from field studies quantifying the difference in evaluation results between “gold standard” randomized controlled trial methods versus quasi-experimental methods,” work joint with Baylis, Patrick, Peter Cappers, Ling Jin, Annika Todd.
July 2016	Electric Power Research Institute (EPRI) and Center for Information Technology Research in the Interest of Society (CITRIS) Consumer Connectivity and Analytics Workshop: “Smart Grid, Behavior, and Big Data: improved customer targeting for residential utility programs,” work joint with Sam Borgeson, Dan Fredman, Ling Jin, Annika Todd.
June 2015	AERE Summer Conference: “The Implications of Market Structure for Appliance Energy Efficiency Regulation.”
December 2014	Behavior Energy and Climate Change (BECC) 2014: “Using Data to Identify Energy Behaviors, Actions, and Characteristics of Households,” work joint with Annika Todd.
November 2014	Energy Institute at Haas Seminar: "The Implications of Market Structure for Appliance Energy Efficiency Regulation."
July 2014	AERE Session at the AAEA Annual Meeting: “Market Structure and Energy Efficiency Regulation: the case of clothes washers.”
November 2013	Behavior Energy and Climate Change (BECC) 2013: “Loss Aversion and Time-Differentiated Electricity Pricing.” (Poster)
June 2013	ECEEE 2013 Summer Study on Energy Efficiency: “Energy Efficiency and Minimum Standards: A Market Analysis of Recent Changes in Appliance Energy Efficiency Standards in the United States,” work joint with Hung-Chia Yang and Larry Dale.
March 2013	Environment and Resource Economics Seminar, Agricultural and Resource Economics Department, UC Berkeley: “Loss Aversion and Time-Differentiated Electricity Pricing.”

Committee Membership/Leadership Experience:

February 2018 – August 2018	ETA Representative on the LBNL Diversity, Equity, and Inclusion Advisory Board (DAB)
June 2017 – June 2018	Assistant Group Leader, Electricity Markets and Policy Group, LBNL
July 2016 – December 2017	Member of the ETA Mentoring Committee
February 2017 – August 2018	Founder and Leader of the Energy Technologies Area (ETA) Diversity & Inclusion Working Group
April 2014 – August 2018	Division Representative on the LBNL Diversity & Inclusion Council.

Teaching Experience:

Spring 2012	Regulation of Energy and Environment (EEP 147), Graduate Student Instructor, UC Berkeley, Supervising Professor: Meredith Fowlie
Fall 2011	Intermediate Microeconomics (IAS 106), Graduate Student Instructor, UC Berkeley, Supervising Professor: Maximilian Auffhammer
Spring 2011	Environmental Economics (EEP C101/ECON C125), Graduate Student Instructor, UC Berkeley, Supervising Professor: David Zilberman

Fall 2010 Natural Resource Economics (EEP C102/ECON C102), Graduate Student Instructor, UC Berkeley, Supervising Professor: Hossein Farzin

Spring 2010 Intermediate Macroeconomics (IAS 107), Graduate Student Instructor, UC Berkeley, Supervising Professor: Maximilian Auffhammer

Other Information:

Analytic Software: STATA, Matlab, ArcGIS

Languages: English (native), French (conversant), Modern Standard Arabic (basic)

Referee Service:

- 2014 ACEEE Summer Study on Energy Efficiency in Buildings
- DOE SEEDS Program SunShot Initiative
- Environment for Development Program
- RFF Working Paper Series
- American Economic Review
- European Economic Review
- Energy Journal
- Transportation Research Part A
- Transportation Research Part D