Rebecca Ciez

Postdoctoral Research Scientist
Columbia University
500 W. 120th St, New York, NY 10027

rec2125@columbia.edu
rciez2125.github.io

EDUCATION

Carnegie Mellon University, College of Engineering, Pittsburgh, PA
Ph.D. Engineering and Public Policy, 2018

Columbia University, School of Engineering and Applied Science, New York, NY
B.S. Mechanical Engineering, Economics & Sustainable Engineering Minors, 2013

EXPERIENCE

Columbia University, Chemical Engineering, New York, NY
Postdoctoral Research Scientist (2020)
Andlinger Center for Energy and the Environment, Princeton University, Princeton, NJ
Distinguished Postdoctoral Fellow (2018 – 2020)
Carnegie Mellon University, Engineering and Public Policy, Pittsburgh, PA
Graduate Research Assistant (2013 – 2018)
ASME, Washington DC
Public Policy Research Intern (2014)

SELECTED HONORS AND AWARDS

Andlinger Distinguished Postdoctoral Fellowship (2018-2020)
Carnegie Mellon GSA/Provost Office Graduate Project Research Grant (2017)
NSF Graduate Research Fellowship (2015-2018)
Neil and Jo Bushnell Fellowship (2014)
Friedman Fellowship (2014)
Columbia University King's Crown Civic Responsibility Award (2013)

WORKING PAPERS

10. David L. Greene, Judith M. Greenwald, **Rebecca E. Ciez***, *US fuel economy and greenhouse gas standards: What have they achieved and what have we learned*?

PUBLICATIONS

9. Guannan He, **Rebecca E. Ciez**, Qixin Chen, Panayiotis Moutis, Soummya Kar, Jay Whitacre*, *The Economic End of Life of Electrochemical Energy Storage*, Applied Energy, (2020) Accepted https://arxiv.org/abs/1811.08486

8. Eric Hittinger*, **Rebecca E. Ciez**, *Modeling the costs and benefits of energy storage systems,* Annual Review of Environment and Resources, **45**, (2020)

7. **Rebecca E. Ciez**, Daniel Steingart*, *Asymptotic Cost Analysis of Intercalation Lithium Ion Systems for Multi-Hour Duration Energy Storage*, Joule, **4**, 1-18 (2020)

6. **Rebecca E. Ciez**, J.F. Whitacre*, *Examining different recycling processes for lithium-ion batteries*. Nature Sustainability, **2**, 148-156, (2019)

5. Kevin Knehr, Robert Buline, Todd Baldwin, Erick Guzman, Hang Huynh, **Rebecca E. Ciez**, Daniel Steingart*, *Optimization and Design of the Minimal Architecture Zinc-Bromine Battery using Insight from a Levelized Cost of Storage Model*, Journal of the Electrochemical Society **165**, A4041-A4050 (2018)

4. Brian Sergi, Matthew Babcock, Nathaniel J. Williams, Jesse Thornburg, Aviva Loew, **Rebecca E. Ciez***, *Institutional Influence on Power Sector Investments: A Case Study of Distributed and Centralized Energy in Kenya and Tanzania,* Energy Research and Social Science **41**, 59-70 (2018)

3. **Rebecca E. Ciez**, J.F. Whitacre*, *Comparison between cylindrical and prismatic li-ion cell costs using a process based cost model*, Journal of Power Sources **340**, 273-281 (2017)

2. **Rebecca E. Ciez**, J.F. Whitacre*, *The cost of lithium is unlikely to upend the price of Li-ion storage systems*, Journal of Power Sources **320**, 310-313 (2016)

1. **Rebecca E. Ciez**, J.F. Whitacre*, *Comparative techno-economic analysis of hybrid micro-grid systems utilizing different battery types*, Energy Conversion and Management **112**, 435-444 (2016)

CONFERENCE PRESENTATIONS

9. *Effectiveness of expert judgement in technology innovation*. USAEE/IAEE North American Conference, Denver, CO, November 6, 2019.

8. *Batteries for environmental goals.* Center for Energy Initiatives Battery and Energy Storage Workshop, New York, NY, October 22, 2019. (Invited)

7. *Recycled Battery Materials for Electric Vehicles: Cost and Consumer Perceptions*. USAEE/IAEE North American Conference, Washington, DC, September 25, 2018.

6. *The Costs and Environmental Impacts of Lithium-Ion Battery Production and Recycling.* International Battery Seminar & Exhibit. Fort Lauderdale, FL, March 26-29, 2018.

5. *Evaluating food-energy-water systems with a concurrent assessment method*. Energy Policy Research Conference. Santa Fe, NM, September 8-9, 2016.

4. *Prospects for lithium ion battery recycling in a changing market.* Energy Policy Research Conference. Santa Fe, NM, September 8-9, 2016.

3. *Process-based cost modeling of cylindrical lithium-ion batteries.* ASME Power & Energy Conference & Exhibition: Energy Storage Forum. Charlotte, NC, June 26-30, 2016.

2. *How do different battery chemistries perform in a hybrid microgrid?* ASME Power & Energy Conference & Exhibition: Energy Storage Forum. Charlotte, NC, June 26-30, 2016.

1. *Energy Storage Optimization: A Techno-economic Analysis of Battery Chemistries in Hybrid Microgrids*. USAEE/IAEE North American Conference, Pittsburgh, PA, October 27, 2015.

POSTER PRESENTATIONS

12. *How cheap can long-duration lithium-ion batteries be?* Andlinger Center Annual Meeting, Princeton, NJ, November 8, 2019.

11. *How cheap can long-duration lithium-ion batteries be?* Princeton E-ffiliates Partnership Retreat, Princeton, NJ, June 11, 2019.

10. *How Effective is Expert Judgement for Technology Innovation?* Andlinger Center Advisory Board Meeting, Princeton, NJ, May 2, 2019.

9. *How cheap can long-duration lithium-ion batteries be?* Andlinger Center Annual Meeting, Princeton, NJ, November 9, 2018.

8. *Recycled batteries for electric vehicles: A first look at EV owner preferences*, Princeton E-ffiliates Partnership Retreat, New York, NY, June 13, 2018.

7. *Recycled batteries for electric vehicles: A first look at EV owner preferences,* Carnegie Mellon Innovation with Impact Exhibition, Pittsburgh, PA, April 12, 2018.

6. *Analyzing Food-Energy-Water systems with a concurrent assessment method,* International Conference on Energy Research and Social Science, Sitges, Spain, April 2-5, 2017.

5. *Lithium-ion battery costs: Can manufacturing economies of scale deliver cost goals?* Carnegie Mellon Electrochemical Energy Symposium, Pittsburgh, PA, October 21, 2016.

4. *Lithium-ion battery costs: Using process-based cost modeling to capture the manufacturing costs of recent battery trends*. Carnegie Mellon Energy Week, Pittsburgh, PA, March 14-18, 2016.

3. *Optimizing Energy Storage: A Techno-Economic Analysis for Hybrid Microgrid Systems*. Center for Climate and Energy Decision Making Annual Meeting, Pittsburgh, PA, May 20-21, 2015.

2. *Optimizing Energy Storage: A Techno-Economic Analysis for Hybrid Microgrid Systems*. Engineering Sustainability: Innovation and the Triple Bottom Line, Pittsburgh, PA, April 20, 2015.

1. *The (Not So) Little Engine That Could: Implementing Multifunction Energy Platforms in Uganda*. National Sustainable Design Expo, Washington, DC, April 18-19, 2013.

OTHER PRESENTATIONS

10. *Low-cost grid energy storage: cost limits of lithium-ion batteries.* Columbia Electrochemical Energy Center, New York, NY, September 27, 2019.

9. *Grid Energy Storage*. Andlinger Center Advisory Board Meeting, Princeton, NJ, May 2, 2019.

8. *Trends in Energy Storage Costs*. Electricity Roundtable: The role of storage in Alberta's electricity market, University of Calgary School of Public Policy, Calgary, AB, March 18, 2019. (Invited)

7. *Low-cost grid energy storage: cost limits of lithium-ion batteries*. NREL, Golden, CO, March 15, 2019. (Invited)

6. *Lithium-Ion Battery Recycling Processes: Environmental Impacts and Economics*, Decommissioning, End of Life, and Recycling Energy Storage Association Webinar, March 13, 2019.

5. *Reducing BEV battery costs: contributions from manufacturing and recycling*. UC Davis Sustainable Transportation Energy Pathways Seminar. June 20, 2017. (Invited)

4. *Battery reuse and recycling in a changing energy storage market*. Carnegie Mellon Electricity Industry Center Advisory Committee Meeting. October 26, 2016.

3. *Policies Shaping Power Africa: Perspectives on Energy Policy for the Developed and Developing World*. ASME Board on Government Relations. November 16, 2014.

2. Panel Moderator, *Early Career Engineer Mini-Talks*. ASME Board on Career Development, November 16, 2014.

1. *The Techno-Economics of Distributed Hybrid Micro-grid Systems: Optimizing the Energy Storage Element*. Carnegie Mellon Electricity Industry Center Advisory Committee Meeting. October 21, 2014.

TEACHING AND MENTORING EXPERIENCE

Columbia University

MBA Independent Research Mentor, Angelica Crispino (Spring 2020)
Project: Economies of Scale of Flow Batteries
MS (Earth & Environmental Engineering) Thesis Supervisor, David Ng (Fall 2019)
Project: Modeling the Use of Zinc as an Energy Storage Medium for Seasonal Arbitrage of Electrical Power

Carnegie Mellon University

External Project Mentor, Electrochemical Energy Storage Systems (Fall 2018)
Project: Lithium-Ion Battery Recycling and Reuse Decision Tree

Engineering for Change

Expert Fellow advising Water, Energy, and Transport Research Fellows (Summer 2017)

Carnegie Mellon University – Teaching Assistant

Energy Policy and Economics (Spring 2016, Spring 2017)
Materials for Energy Storage (Spring 2016)

LEADERSHIP AND SERVICE

Center for Energy Initiatives Battery and Energy Storage Workshop, Organizing Committee (2019)

Institute for Transformative Technologies, 50 Breakthroughs Scientific Translation Committee (2019)

World Bank Technology Futures Workshop (April 24, 2018)

Reviewer US Department of Energy Vehicle Technologies Office (2019), US Department of Energy Advanced Manufacturing Office (2019), US Department of Defense Strategic Environmental Research and Development Program (2020)

Journal Reviewer Applied Energy, Energies, Energy, Energy Conversion and Management, Sustainable Production and Consumption

ASME

Nominating Committee Voting Member (2018-2020)
Nominating Committee Alternate Member (2017-2018)

Society of Women Engineers

WE Local Pittsburgh Conference Host Committee Chair (2016-2017)
Pittsburgh Section Representative (2016-2017)

PROFESSIONAL AND CONSULTING EXPERIENCE

ASME, 2013

Integrated technical data collected from researchers and subject matter experts to develop an online decision aid tool for base-of-pyramid consumers. Assisted in the development and launch of *Demand*, an international development case study journal.

Disney/ABC Television, 2012

Supported commissioning process for LEED silver building and NYSERDA supported energy audits. Assisted in the management of mechanical and electrical systems of broadcast facilities.

Uncharted Play, 2012

Analyzed and recommended sustainable manufacturing processes and end-of-life practices for consumer electronics. Designed surveys using mobile data collection technologies to measure consumer satisfaction and product impact.

MEDIA AND BLOG POSTS

Andlinger Center Speaks: Electric vehicles, their batteries, and the road to electric transportation, June 17, 2019.

Wired: VW Will Make Its Own Batteries to Power an Electric Future, May 19, 2019

The Wall Street Journal: The Secret to Why a Tesla Costs So Much (Hint: Batteries), February 19, 2019.

Nature Research Sustainability Community: Behind the paper: Examining different recycling processes for lithium-ion batteries, February 11, 2019.

Press Release: Making green cars greener with battery recycling, February 12, 2019.

ARS Technica: Electric car batteries might be worth recycling, but bus batteries aren't yet, February 12, 2019

IEEE Spectrum: 2017 Is the Make-or-Break Year for Tesla's Gigafactory, December 30, 2016.

Green Car Congress: CMU study suggests difficulties in reaching target low price points for Li-ion batteries, December 11, 2016.

Charged: New study: Lithium cost swings unlikely to impact battery prices, May 26, 2016.

Green Car Congress: CMU study concludes lithium market fluctuations unlikely to impact Li-ion battery prices significantly, May 5, 2016.