

Braden Jeffery Limb

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EDUCATION:

Doctor of Philosophy, Systems Engineering

Colorado State University, Fort Collins, Colorado, August 2024

Research: The Dual Lens of Sustainability: Economic and Environmental Insights into Carbon Reduction Technologies

4.00 GPA

Masters of Science, Mechanical Engineering

Utah State University, Logan, Utah, December 2016

Research: Optimization of Roadway Electrification Integrating Wireless Power Transfer: Techno Economic Assessment and Lifecycle Analysis

4.00 GPA

Bachelor of Science, Mechanical Engineering (Summa Cum Laude)

Utah State University, Logan, Utah, May 2015

Minor in Mathematics

3.96 GPA

PROFESSIONAL & RESEARCH EXPERIENCE:

Research Associate IV (August 2023 – Present)

Colorado State University, Fort Collins, Colorado

Research Associate III (September 2020 – July 2023)

Colorado State University, Fort Collins, Colorado

Mechanical/Electrical Engineer II (January 2017 – September 2020)

Infinite Technologies Inc., Clearfield, Utah

Graduate Research Assistant (January 2015 – December 2016)

Department of Mechanical and Aerospace Engineering, Utah State University, Logan, UT

Academic Advisors: Jason C. Quinn (MAE), Regan Zane (EE), Robert Spall (MAE)

Governor's Energy Leadership Scholar (October 2015 – September 2016)

Utah Energy Research Triangle, Utah

Research Assistant (May 2015 – June 2015)

Department of Mechanical Engineering, Colorado State University, Fort Collins, CO

Advisor: Dr. Thomas Bradley (ME)

Associate Engineering Intern (May 2014 – August 2014)
Questar Gas Company, Salt Lake City, UT

RESEARCH INTERESTS:

Methodology: techno economic analysis, life cycle assessment, agent-based modeling

Applications: sustainable energy systems (electricitrified transportation, carbon capture and storage, solar energy, biofuels and sustainable aviation fuels), energy storage technologies

REFEREED PUBLICATIONS:

(h-index = 8; i-10 index = 7 via [Google Scholar](#))

1. J. P. Smith, **B. J. Limb**, C. M. Beal, K. R. Banta, J. L. Field, S. J. Simske, J. C. Quinn, *Evaluating the sustainability of the 2017 US biofuel industry with an integrated techno-economic analysis and life cycle assessment*, Journal of Cleaner Production, August 2023. <https://doi.org/10.1016/j.jclepro.2023.137364>
2. D. Quiroz, J. M. Greene, **B. J. Limb**, J. C. Quinn, *Global Life Cycle and Techno-Economic Assessment of Algal-Based Biofuels*, Environmental Science & Technology, July 2023. <https://doi.org/10.1021/acs.est.3c02892>
3. A. Asuega, **B. J. Limb**, J. C. Quinn, *Techno-economic analysis of advanced small modular nuclear reactors*, Applied Energy, January 2023. <https://doi.org/10.1016/j.apenergy.2023.120669>
4. **B. J. Limb**, E. Markey, R. Vercellino, S. Garland, M. D. Pisciotta, P. Psarras, D. R. Herber, T. Bandhauer, J. C. Quinn, *Economic Viability of Thermal Energy Storage on Natural Gas Power Plants with Carbon Capture*, Journal of Energy Storage, November 2022. <https://doi.org/10.1016/j.est.2022.105836>
5. **B. J. Limb**, Z. D. Asher, T. H. Bradley, E. Sproul, D. A. Trinko, B. Crabb, R. Zane, J. C. Quinn, *Economic Viability and Environmental Impact of In-Motion Wireless Power Transfer*, IEEE Transactions on Transportation Electrification, October 2018. <https://doi.org/10.1109/TTE.2018.2876067>
6. **B. J. Limb**, D. G. Work, J. Hodson, and B. L. Smith, *The Inefficacy of Chauvenet's Criterion for Elimination of Data Points*, Journal of Fluids Engineering, May 2017. <https://doi.org/10.1109/TTE.2018.2876067>

REFEREED CONFERENCE PUBLICATIONS:

1. **B. J. Limb**, E. Markey, R. Vercellino, J. Huyett, S. Garland, M. D. Pisciotta, P. Psarras, E. Meuleman, N. Fine, M. Abarr, D. R. Herber, J. C. Quinn, T. Bandhauer, *Evaluating the economic viability of NGCC-SWITCC: Natural Gas Combined Cycle System With Integrated Thermal storage and Carbon Capture*, 16th International Conference on Greenhouse Gas Control Technologies (GHGT-16), Lyon, France, October 2022. <https://doi.org/10.2139/ssrn.4295563>
2. R. Vercellino, E. Markey, **B. J. Limb**, M. D. Pisciotta, J. Huyett, S. Garland, T. Bandhauer, J. C. Quinn, P. Psarras, and D. R. Herber, *Control Co-Design Optimization of*

- Natural Gas Power Plants With Carbon Capture and Thermal Storage*, 2022 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, St. Louis, MO, USA, August 2022.
3. E. Sproul, D. A. Trinko, Z. D. Asher, **B. J. Limb**, T. H. Bradley, J. C. Quinn, and R. Zane, *Electrification of class 8 trucking: Economic analysis of in-motion wireless power transfer compared to long-range batteries*, 2018 IEEE Transportation Electrification Conference and Expo, Long Beach, CA, USA, June 2018. <https://doi.org/10.1109/ITEC.2018.8450203>
 4. **B. J. Limb**, T. H. Bradley, B. Crabb, R. Zane, C. McGinty, J. C. Quinn, *Economic and Environmental Feasibility, Architecture Optimization, and Grid Impact of Dynamic Charging of Electric Vehicles using Wireless Power Transfer*, The 6th Hybrid and Electric Vehicle Conference, London, UK, November 2016. <https://doi.org/10.1049/cp.2016.0988>
 5. **B. J. Limb**, T. H. Bradley, B. Crabb, R. Zane, C. McGinty, J. C. Quinn, *Economic feasibility and infrastructure optimization of in-motion charging of electric vehicles using wireless power transfer*, 2016 IEEE PELS Workshop on Emerging Technologies: Wireless Power Transfer, Knoxville, TN, USA, October 2016. <https://doi.org/10.1109/WoW.2016.7772064>
 6. **B. J. Limb**, T. H. Bradley, R. Zane, J. C. Quinn, *Infrastructure Optimization and Economic Feasibility of In-Motion Wireless Power Transfer*, 2016 IEEE Transportation Electrification Conference, Dearborn, MI, USA, June 2016. <https://doi.org/10.1109/ITEC.2016.7520245>
 7. J. C. Quinn, **B. J. Limb**, Z. Pantic, P. Barr, R. Zane, T. H. Bradley, *Feasibility of Wireless Power Transfer for Electrification of Transportation: Techno-economics and Life Cycle Assessment*, SusTech 2015 - IEEE Conference on Technologies for Sustainability, Ogden, UT, USA, July 2015. <https://doi.org/10.1109/SusTech.2015.7314354>
 8. J. C. Quinn, **B. J. Limb**, Z. Pantic, P. Barr, R. Zane, *Techno-Economic Feasibility and Environmental Impact of Wireless Power Transfer Roadway Electrification*, IEEE Wireless Power Transfer Conference 2015, Boulder, CO, USA, May 2015. <https://doi.org/10.1109/WPT.2015.7139140>

AWARDED GRANTS:

1. **B. J. Limb**, J. C. Quinn, *Environmental Impact, Economic Feasibility, and Optimization of Transportation Electrification Integrating Wireless Power Transfer*, Governor's Energy Leadership Scholars Program, Utah's 10-Year Strategic Energy Plan, UT, USA, August 2015

CONFERENCE ORAL PRESENTATIONS:

1. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Biomass Storage and Burial Model (preliminary LCA & TEA results)*, Biomass Storage and Burial For Carbon Removal - A BiCRS/WHIS Informational Workshop (Department of Energy), Washington D.C., USA, November 2023
2. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Sustainable aviation fuel production potential of algae on marginal lands in the US*, 2023 Algae Biomass Summit, Madison, WI, USA, October 2023

3. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *County-level Life Cycle Assessment of Sustainable Aviation Fuel Feedstocks in the Contiguous US*, ACLCA 2023 Conference, Burlington, VT, USA, September 2023
4. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Sustainability Assessment of Purpose Grown Sustainable Aviation Fuel Feedstocks in the Contiguous United States*, International Congress on Sustainability Science & Engineering (ICOSSE '23), Houston, TX, USA, September 2023
5. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Feasibility of Purpose Grown Feedstocks for Sustainable Aviation Fuel in the Contiguous United States: Production Potential, Economic Feasibility, Environmental Impact, and Land Use*, North America SAF Conference & Expo, Minneapolis, MN, USA, August 2023
6. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Bioenergy production on marginal land in the contiguous United States: potential, economic feasibility, and greenhouse gas emissions*, International Symposium on Sustainable Systems and Technology, Fort Collins, CO, USA, June 2023
7. **B. J. Limb**, J. P. Smith, C. Beal, K. Banta, J. Kern, E. A. Akdemir, S. J. Simske, J. C. Quinn, *Economic and Environmental Feasibility of Sustainable Aviation Fuel Production in the US using Agent-Based Modeling*, International Symposium on Sustainable Systems and Technology, Fort Collins, CO, USA, June 2023
8. **B. J. Limb**, J. P. Smith, C. Beal, N. Putnam, E. Sproul, K. Banta, J. Kern, E. A. Akdemir, J. C. Quinn, *Evaluation of Biofuel Pathways in the CONUS using an Integrated Agent-Based Modeling Framework*, International Symposium on Sustainable Systems and Technology, Pittsburgh, PA, USA, June 2022
9. **B. J. Limb**, E. Markey, R. Vercellino, S. Garland, M.D. Pisciotta, P. Psarras, D.R. Herber, T. Bandhauer, J. C. Quinn, *Economic Viability of Thermal Energy Storage to Support Flexible Operation of Natural Gas Power Plants with Carbon Capture*, ASTFE's 7th Thermal and Fluids Engineering Conference, Las Vegas, NV, USA, May 2022
10. **B. J. Limb**, E. Markey, S. Garland, R. Vercellino, M.D. Pisciotta, P. Psarras, J. Wilcox, D.R. Herber, T. Bandhauer, J. C. Quinn, *Economic Viability of Flexible Carbon Capture for Natural Gas Power Plants*, TechConnect World Innovation Conference & Expo, Washington, DC, October 2021
11. **B. J. Limb**, E. Markey, S. Garland, R. Vercellino, A. K. Sundarrajan, M. D. Pisciotta, J. Wilcox, D. R. Herber, T. Bandhauer, J. C. Quinn, *The future of carbon capture: A story of the tortoise and the hare*, International Symposium on Sustainable Systems and Technology, Virtual, June 2021
12. **B. J. Limb**, T. H. Bradley, R. Zane, J. C. Quinn, *Infrastructure Optimization and Economic Feasibility of In-Motion Wireless Power Transfer*, 2016 IEEE Transportation Electrification Conference, Dearborn, MI, USA, June 2016
13. **B. J. Limb**, *Electric Highways*, ideacity 2016, Toronto, ON, Canada, June 2016
<http://www.ideacity.ca/video/braden-limb-electric-highways/>
14. **B. J. Limb**, *The Electric Vehicle Revolution*, 2016 Student Research Symposium, Logan, UT, USA, April 2016
15. J. C. Quinn, **B. J. Limb**, Z. Pantic, P. Barr, R. Zane, *Feasibility of Wireless Power Transfer for Electrification of Transportation: Techno-economics and Life Cycle Assessment*, SusTech 2015 - IEEE Conference on Technologies for Sustainability, Ogden, UT, USA, August 2015

16. J. C. Quinn, **B. J. Limb**, Z. Pantic, P. Barr, R. Zane, *Techno-Economic Feasibility and Environmental Impact of Wireless Power Transfer Roadway Electrification*, IEEE Wireless Power Transfer Conference 2015, Boulder, CO, USA, May 2015

CONFERENCE POSTER PRESENTATIONS:

1. **B. J. Limb**, J. P. Smith, S. J. Simske, J. C. Quinn, *Algae sustainable aviation fuel production on marginal lands in the US: potential, economic feasibility, and greenhouse gas emissions*, International Conference on Algal Biomass, Biofuels and Bioproducts (AlgalBBB 2023), Waikoloa Beach, HI, USA, June 2023
2. **B. J. Limb**, J. C. Quinn, *Electrification of Transportation Integrating Wireless Power Transfer: Economic Feasibility, Environmental Assessment, and Infrastructure Optimization*, 2016 Governor's Energy Development Summit, Salt Lake City, UT, USA, May 2016
3. **B. J. Limb**, T. H. Bradley, R. Zane, J. C. Quinn, *Economic Feasibility, Vehicle Optimization, and Vehicle-to-Grid Assessment of Roadway Electrification*, Conference on Electric Roads and Vehicles, Logan, UT, USA, May 2016
4. **B. J. Limb**, T. H. Bradley, P. Barr, R. Zane, J. C. Quinn, *Techno-Economic and Life Cycle Assessment of Wireless Power Transfer Roadway Electrification*, 2015 USTAR Confluence: Where Innovative Ideas Seed, Grow and Thrive, Salt Lake City, UT, USA, September 2015

SERVICE:

- 2023 Webmaster, International Symposium on Sustainable Systems and Technology, Fort Collins, CO, USA, June 2023
- 2022 Reviewer and Photographer, International Symposium on Sustainable Systems and Technology, Pittsburgh, PA, USA, June 2022
- 2021 Reviewer and Session Chair, International Symposium on Sustainable Systems and Technology, Virtual, June 2021

AWARDS:

- 2016 Excellent Communicator Award, Student Research Symposium, Utah State University
- 2015 Bill E. Robins Memorial Award Finalist, Utah State University
<https://www.usu.edu/involvement/events/robins-awards>
- 2015 Academic Excellence Award – Senior, Mechanical and Aerospace Engineering Department, Utah State University
- 2014 Academic Excellence Award – Junior, Mechanical and Aerospace Engineering Department, Utah State University
- 2013 Academic Excellence Award – Pre-Professional, Mechanical and Aerospace Engineering Department, Utah State University

MEDIA ATTENTION:

1. Metro Morning Interview, CBC Radio, June 15th, 2016
<http://www.cbc.ca/news/canada/toronto/programs/metromorning/electrified-roads1.3636067>
2. The Utah Statesman Article, February 2nd, 2016 <http://usustatesman.com/electrified-transportation-on-the-horizon-at-utah-state/>
3. IEEE USA InSight Article on SusTech 2015, September 19th, 2015
<http://insight.ieeeusa.org/insight/content/ieeeusa/177246>