MICHAEL CARBAJALES-DALE

PERSONAL DATA

Associate Professor
Department of Environmental Engineering and Earth Sciences
School of Civil and Environmental Engineering and Earth Sciences
Clemson University
Clemson, SC 29634
(864) 656-0523

EDUCATION

- Ph.D., University of Canterbury, New Zealand, 2011, Mechanical Engineering
- M.S., Bristol University, UK, 2006, Physics & Philosophy
- B.S., Bristol University, UK, 2005, Physics & Philosophy

PROFESSIONAL EXPERIENCE

- Clemson University, 2020- , Associate Professor of Environmental Engineering and Earth Sciences
- Clemson University, 2014-2020, Assistant Professor of Environmental Engineering and Earth Sciences
- Stanford University, 2014-2014, Research Associate
- Stanford University, 2013-2013, Teaching Fellow
- Stanford University, 2011-2013, Postdoctoral Fellow

PROFESSIONAL MEMBERSHIP

- Planetary Limits Academic Network (2022-Present)
- Society of Environmental Toxicology & Chemistry (2018-Present)
- Association of Environmental Engineering & Science Professors (2016-Present)
- American Center for Life Cycle Assessment (2014-Present)
- International Society for Industrial Ecology (2016-Present)
- International Society for Ecological Economics (2013-Present)
- New Zealand Society for Sustainability Engineering & Science (2008-2010)

PROFESSIONAL ACTIVITIES

- **Member**, American Center for Life Cycle Assessment (ACLCA) Scientific Advisory Board (2024-Present)
- **Chief Editor**, Frontiers in Energy Research, Sustainable Energy Systems (2023-Present)
- **Co-Chair**, ACLCA Working Group on LCA for Emerging Technologies (2019-Present)
- **Member**, Planetary Limits Academic Network (PLAN) General Circle (2023-Present)
- **Member**, PLAN Scholarly Projects Circle (2022-Present)
- **Member**, SETAC North America LCA Interest Group Steering Committee (2018-Present)
- **Member** ACLCA Technical Advisory Committee (2018-Present)
- **Member**, ACLCA Education Committee (2016-Present)
- **Member**, Scientific Advisory Board, Responsible Battery Coalition (2017-Present)
- **Member**, Scientific Advisory Board, International Society for Biophysical Economics (2017-Present)
- **Managing Editor**, Journal of Biophysical Economics and Sustainability (2015-2023)
- **Organizing Committee**, University of Calgary Workshop on LCA of Emerging Technologies (2017)
- **Organizing Committee**, ACLCA XVI Conference, (2016)
- **Organizing Committee**, Global Climate and Energy Project Workshop on Net Energy Analysis (2014-2015)
- **Reviewer:**

- **Academic Journals**: Energies, Energy Policy, Energy & Energy & Environmental Science; Environmental Research Letters; Environmental Science & Technology; Frontiers Energy Systems and Policy International Journal of Life Cycle Assessment; Journal of Cleaner Production Philosophical Transactions; Proceedings of the ASME; Science of the Total Environment; Sustainable Production & Consumption; Sustainability; The Energy Journal
- **External Doctoral Theses:** University of Bilbao, Spain; UT Austin; Lincoln University, New Zealand
- **Books**: CRC Press, Post Carbon Institute
- **Funding Agencies**: US National Science Foundation; Masdar Institute, UAE
- **Reports**: UK Dept. for International Development; International Energy Agency PVPS Task 12

PUBLICATIONS (* = Clemson student or other mentee, e.g., post-doc)

Over **fifty publications** (17 since tenure) in top-tier journals. Over **3500 citations** (over 2400 since 2019) with one paper having over 350 citations, two papers with over 200 citations, nine papers with over 100 citations, and twelve papers with over 50 citations. I have also published four book chapters (three since tenure) and one monograph. My group's research has been published in the top journals within our field of energy and environmental science including: **Nature Energy** (impact factor 67.4), **Energy and Environmental Science** (4 publications, impact factor 39.7), **Nature Climate Change** (impact factor 28.8), **IEEE Proceedings** (impact factor 20.6), **Renewable & Sustainable Energy Reviews** (impact factor 17.0), **Environmental Science & Technology** (impact factor 11.4), **Science of the Total Environment** (impact factor 10.8), **Journal of Cleaner Production** (3 publications, impact factor 9.7), and **Energy** (impact factor 9.0), among others.

H-Index: 31 (26 since 2019)

I10-Index: 39 (37 since 2019)

Refereed Journal Publications

Published:

1. Yakubu, R. O., Ijeoma, M. W.*, Yusuf, H., Abdulazeez, A. A., Acheampong, P. and **Carbajales-Dale, M.** (2024) Performance Analysis of a 50 MW Solar PV Installation at BUI Power Authority: A Comparative Study Between Sunny and Overcast Days, Electricity, DOI:10.3390/electricity5030027
2. Chen, H.*, Can Şener, Ş., Van Emberg, C.*, Jones, M.*, Bogucki, T.*, Bonilla, N.*, Ijeoma, M. W.*, Wan, H., **Carbajales-Dale, M.** (2024) Electric light-duty vehicles have decarbonization potential but may not reduce other environmental problems, Nature Communications Earth & Environment, DOI:10.1038/s43247-024-01608-z. **Impact factor: 8.4**
3. Ijeoma, M. W.*, Lewis, C. G.*, Chen, H.*, Chukwu, B. N. and **Carbajales-Dale, M.** (2024) Technical, Economic, and Environmental Feasibility Assessment of Solar-Battery-Generator Hybrid Energy Systems: A Case Study in Nigeria, Frontiers in Energy Research, DOI:10.3389/fenrg.2024.1397037. **Impact factor: 2.6**
4. Delannoy, L., Auzanneau, M., Andrieu, B., Vidal, O., Longaretti, P-Y, Prados, E., Murphy, D. J., Bentley, R. W., **Carbajales-Dale, M.**, Raugei, M., Höök, M., Court, V., King, C. W., Fizaine, F., Jacques, P., Heun, M. K., Jackson, A., Guay-Boutet, C., Aramendia, E., Wang, J., Le Boulzec, H. and Hall, C. (2024) Emerging consensus on net energy paves the way for improved integrated assessment modeling, Energy & Environmental Science, DOI:10.1039/D3EE00772C. **Impact factor: 39.7**
5. Wattier, B.*; Shuller-Nickles, L.; **Carbajales-Dale, M.** and Martinez, N. (2023) Use of life cycle impact assessment (LCIA) to advance holistic optimisation of radiological protection and safety, Journal of Radiological Protection, *IN PRESS*, **Impact factor: 1.6**
6. Murdoch, L.; Germanovich, L.; Slack, W.; **Carbajales-Dale, M.**; Knight, D.; Moak, R.; Laffaille, C.; DeWolf, S.; Roudini, S. (2023) Shallow Geologic Storage of Carbon to Re- move Atmospheric CO2 and Reduce Flood Risk, Environmental Science & Technology DOI: 10.1021/acs.est.3c00600, **Impact factor: 11.4**
7. Dal Pozzo, A.; Björklund, A.; **Carbajales-Dale, M.**; Hischier, R.; Ravikumar, D. and Righi, S. (2022) Editorial: Early-stage Quantitative Sustainability Assessment: Approaches for Pol- icy, Processes and Materials, Frontiers in Sustainability, section Quantitative Sustainability Assessment, DOI:10.3389/frsus.2023.1125016, **Impact factor: 2.1**

8. **Carbajales-Dale, M.** and Murphy, T. (2022) The environmental and moral implications of human space travel, Science of the Total Environment, DOI:10.1016/j.scitotenv.2022.159222, Impact factor: 10.8
9. Murphy, D.; Raugei, M.; **Carbajales-Dale, M.** and Rubio Estrada, B. (2022) Energy Return on Investment of major energy carriers: review and harmonization, Sustainability, DOI:10.3390/su14127098, **Impact factor: 3.9**
10. Fthenakis, V. M.; Raugei, M.; Breyer, C.; Bhattacharya, S.; Ginsberg, M.; Jaeger-Waldau, A.; Lecissi, E.; Lincot, D.; Murphy, D.; Perez, M. R.; Sinha, P.; Rockett, A.; Sadewasser, S.; Stanbery, B. J.; Swanson, R. and **Carbajales-Dale, M.**; (2022) Critique of the paper: "Through the Eye of a Needle: An Eco-Heterodox Perspective on the Renewable Energy Transition", Energies, 15(3), 974, **Impact factor: 3.3**
11. Khoshnevisan, B.; He, L.; Xu, M.; Valverde-Perez, B.; Sillman, J.; Mitraka, G-C.; Kougias, P. G.; Zhang, Y.; Yan, S.; Long, J.; **Carbajales-Dale, M.**; Nashmin Elyasi, S.; Marami, H.; Tsapekos, P.; Liu, H.; and Angelidaki, I. (2022) From renewable energy to sustainable protein sources: Advancement, challenges, and future roadmaps, Renewable and Sustainable Energy Reviews, DOI:10.1016/j.rser.2021.112041, **Impact factor: 16.8**
12. Can Sener, Serife*; Thomas, Valerie; Hogan, David; Maier, Raina; **Carbajales-Dale, M.**; Barton, Mark; Karanfil, Tanju; Crittenden, John; and Amy, Gary L. (2021) Recovery of Critical Metals from Aqueous Sources, Sustainable Chemistry & Engineering, DOI:10.1021/acssuschemeng.1c03005, **Impact factor: 9.2**
13. Nashmin Elyasi, S.; He, L.; Tsapekos, P.; Rafiee, S.; Khoshnevisan, B.; Saeid Mohtasebi, S.; Liu, H.; Angelidaki, I. and **Carbajales-Dale, M.** (2021) Could biological biogas upgrading be a sustainable substitution for water scrubbing technology? A case study in Denmark, Energy Conversion and Management, DOI:10.1016/j.enconman.2021.114550**, Impact factor: 11.5**
14. Mahmud, R.*; Moni, S.*; High, K. and **Carbajales-Dale, M.** (2021) Techno-Economic Analysis and Life Cycle Assessment for Technology Appraisal - A Review, Journal of Cleaner Production, DOI:10.1016/j.jclepro.2021.128247, **Impact factor: 11.1**
15. Brandt, A. R.; Teichgraber, H.; Kang, C. A.; Barnhart, C. J.; Sgouridis, S. and **Carbajales- Dale, M.** (2021) Blow wind blow: Capital deployment in variable energy systems, Energy, DOI:10.1016/j.energy.2021.120198, **Impact factor: 8.9**
16. Clabeaux, R.*; Ladner, D.; Walker, T. and **Carbajales-Dale, M.** (2020) Assessing the carbon footprint of a university campus using a life cycle assessment approach, Journal of Cleaner Production, DOI: 10.1016/j.jclepro.2020.122600, **Impact factor: 6.4**

Pre-tenure:

17. Sherwood, J.*; Haney, B. R. and **Carbajales-Dale, M.** (2020) Putting the Biophysical (back) in Economics: a taxonomic review of modelling the earth-bound economy, Biophysical Eco- nomics and Sustainability, DOI:10.1007/s41247-020-00069-0, **Impact factor: 2.1**
18. Sherwood, J.*; Bickhart Jr.*, R.; Murawski*, E.; Dhanani, Z.; Lytle, B.; Carbajales-Dale, P. and **Carbajales-Dale, M.** (2020) Rolling Coal: The Greenhouse Gas Emissions of Coal Rail Transport for Electricity Generation, Journal of Cleaner Production, DOI:10.1016/j.jclepro.2020. 120770, **Impact factor: 11.1**
19. Koffler, C.; Amor, B. M.; **Carbajales-Dale, M.**, Cascio, J.; Conroy, A.; Fava, J.; Goudreault, C.; Gloria, T.; Hensler, C.; Horvath, A.; Humbert, S.; Manzardo, A.; Margni, M.; Osset, P. Prox, M.; Sinistore, J.; Wallace, M.; Vigon, B. and Wang, M. (2019) On the reporting and review requirements of ISO 14044, The International Journal of Life Cycle Assessment, DOI:10.1007/s11367-019-01706-7, I**mpact factor: 4.8**
20. **Carbajales-Dale, M.** (2019) When is EROI not EROI?, Biophysical Economics and Resource Quality, DOI:10.1007/s41247-019-0065-8. **Impact factor: 2.1**
21. Moni, S.*; Mahmud, R.*; High, K. and **Carbajales-Dale, M.** (2019) Life Cycle Assessment of Emerging Technologies: A Review, Journal of Industrial Ecology, DOI:10.1111/jiec.12965. **Impact factor: 7.2**
22. Bergerson, J.; Brandt, A.; Cresko, J.; **Carbajales-Dale, M.**; MacLean, H.; Matthews, H. S.; McCoy, S.; Mcmanus, M.; Miller, S.; Morrow III, W.; Posen, D.; Seager, T.; Skone, T.; Sleep, S. (2019) Life Cycle Assessment of Emerging Technologies: Evaluation Techniques at Different Stages of Market and Technical Maturity, Journal of Industrial Ecology, DOI:10.1111/jiec.12954. **Impact factor: 7.2**
23. Levi, P.; Davidsson Kurland, S., **Carbajales-Dale, M.;** Weyant, J. P.; Brandt, A.; and Benson, S. M. (2019) Macro-Energy Systems: Toward a New Discipline, Joule, DOI: 10.1016/j.joule.2019.07.017. **Impact factor: 46.0**

24. Karimi, H.*; **Carbajales-Dale, M.** and Eksioglu, S. D. (2019) A Bi-objective Chance Constrained Optimization Model to Evaluate the Economic and Environmental Impacts of Biopower Supply Chains, Annals of Operations Research, DOI: 10.1007/s10479-019-03331-x. **Impact factor: 4.8**
25. Sgouridis, S., **Carbajales-Dale, M.**, Csala, D., Chiesa, M., and Bardi, U. (2019) Comparative net energy analysis of renewable electricity and carbon capture and storage, Nature Energy, DOI:10.1038/s41560-019-0365-7. **Impact factor: 67.4**
26. Langlois, T.*, **Carbajales-Dale, M.**, and Carraway, E. (2018). Visualizing Relative Potential for Aquatic Ecosystem Toxicity Using the EPA Toxics Release Inventory and Life Cycle Assessment Methods. Journal of South Carolina Water Resources, 5(1), 2. Impact factor: N/A
27. **Carbajales-Dale, M.**, and Douglass, B.* (2018). Human-Powered Electricity Generation as a Renewable Resource. BioPhysical Economics and Resource Quality, 3(1), 3. **Impact factor: 2.1**
28. Zhou, Z.* and **Carbajales-Dale, M.** (2018) Assessing the photovoltaic technology land- scape: efficiency and energy return on investment, Energy & Environmental Science, DOI: 10.1039/C7EE01806A. **Impact factor: 39.7**
29. Sherwood, J.*, Clabeaux, R.* and **Carbajales-Dale, M.** (2017) An Extended Environmental- Input-Output Lifecycle Assessment Model to Study the Urban Food-Energy-Water Nexus, Environmental Research Letters, 12(10), 105003. **Impact factor: 4.5**
30. Sherwood, J.*, Ditta, A., Haney, B. Haarsma, L. and **Carbajales-Dale, M.** (2017) Resource Criticality in Modern Economies: Agent-based model demonstrates vulnerabilities from technological interdependence, Biophysical Economics and Resource Quality, 2:9. **Impact factor: 2.1**
31. Raugei, M., Sgouridis, S., Murphy, D., Fthenakis, V., Frischknecht, R., Breyer, C., Bardi, U., Barnhart, C., Brandt, A., Buckley, A., **Carbajales-Dale, M.**, Csala, D., de Wild-Scholten, M., Heath, G., Jaeger-Waldau, A., Jones, C., Keller, A., Leccisi, E., Mancarella, P., Pearsall, N., Siegel, A., Sinke, W., and Stolz, P. (2017) Energy Return on Energy Invested (ERoEI) for photovoltaic solar systems in regions of moderate insolation: A comprehensive response. Energy Policy, 102, 377-384. **Impact factor: 4.0**
32. Farthing, A.*, **Carbajales-Dale M.**, Mason, S., Carbajales-Dale, P. and Matta, P. (2016) Utility-Scale Solar PV in South Carolina: Analysis of Suitable Lands and Geographical Potential. Biophysical Economics & Resource Quality, 1(2). **Impact factor: 2.1**
33. Murphy, D. and **Carbajales-Dale M.** (2016) Comparing Apples to Apples: Why the Net Energy Analysis community needs to adopt the LCA framework. Energies, 9(11), 917. **Impact factor: 2.7**
34. King, C. W. and **Carbajales-Dale, M.** (2016) Food-energy-water metrics across scales: project to system level, Journal of Environmental Studies and Sciences, 6(1), 39-49. **Impact factor: 2.1**
35. Salkeld, D. J., Nieto, N. C., Carbajales-Dale, P., **Carbajales-Dale, M.**, Cinkovich, S. S., and Lambin, E. F. (2015). Disease Risk & Landscape Attributes of Tick-Borne Borrelia Pathogens in the San Francisco Bay Area, California. PLoS one, 10(8), e0134812. **Impact factor: 2.8**
36. **Carbajales-Dale, M.**; Raugei, M.; Fthenakis, V. and Barnhart, C. J. (2015) Energy return on investment (EROI) of solar PV: an attempt at reconciliation, [Point of View]. Proceedings of the IEEE, 103(7), 995-999. **Impact factor: 9.1**
37. Raugei, M.; **Carbajales-Dale, M.**; Barnhart, C. J. and Fthenakis, V. (2015) Rebuttal: "Comments on 'Energy intensities, EROIs (energy returned on invested), and energy payback times of electricity generating power plants' — Making clear of quite some confusion" Energy, dx.doi.org/10.1016/ j.energy.2014.12.060. **Impact factor: 8.9**
38. **Carbajales-Dale, M.** (2014). Investing in a sustainable future. International Innovation, 159, 84-86.

Prior to Clemson:

39. **Carbajales-Dale, M.**; Barnhart, C. J.; Brandt, A. R. and Benson, S. M. (2014). A better currency for investing in a sustainable future. Nature Climate Change, 4(7), 524-527. **Impact factor: 28.9**
40. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2014) Can we afford storage? A dynamic net energy analysis of renewable electricity generation firmed by energy storage, Energy and Environmental Science, 7(5), 1538–1544. **Impact factor: 39.7**
41. Barnhart, C. J.; **Dale, M.**; Brandt, A. R. and Benson, S. M. (2013) The energetic implications of curtailing or storing wind and solar generated electricity, Energy and Environmental Science, 6(10), 2804–2810. **Impact factor: 39.7**
42. Brandt, A.R.; **Dale, M.** and Barnhart, C. (2013) Calculating systems-scale energy efficiency and energy returns: a bottom-up matrix-based approach, Energy, 62, 235–247. **Impact factor: 8.9**
43. Barnhart, C. and **Dale, M.** (2013) Informing the transition to low-carbon energy systems through energy systems analysis of energy storage for the power grid, Stanford Energy Journal, June 2013

44. **Dale, M.** (2013) A comparative analysis of energy of photovoltaic, solar thermal, and wind electricity generation technologies Applied Sciences, 3(2), 325-337. **Impact factor: 2.8**
45. **Dale, M.** and Benson, S. M. (2013) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? Environmental Science & Technology, 47(7), 3482-3489. **Impact factor: 11.4**
46. **Dale, M.** and Barnhart, C. (2012) Fundamentals of Energy, Encyclopedia of Energy, Golson Publishing
47. Krumdieck, S.; **Dale, M.** and Page, S. (2012) Design and Implementation of a Community- based Sustainable Development Action Research Method Social Business, 2, 291-337. **Impact factor: 0.6**
48. Murphy, D.; Nelder, C.; Jefferson, M.; Hall, C.; Laherrere, J.; Baldauf, J.; Kuperus-Heun, M. and **Dale, M.** (2012). Peak Oil is Affecting the Economy Already. Nature 483 (541), Correspondence. Impact factor: 64.8.
49. **Dale, M.** (2012) Meta-Analysis of Non-Renewable Energy Resource Estimates, Energy Policy, 43, 102-122. **Impact factor: 7.6**
50. **Dale, M.**; Krumdieck, S. and Bodger, P. (2012) Global Energy Modelling - a Biophysical Approach (GEMBA) Part 1: An overview of biophysical economics, Ecological Economics, 73, 152-157. **Impact factor: 6.5**
51. **Dale, M.**; Krumdieck, S. and Bodger, P. (2012) Global Energy Modelling - a Biophysical Approach (GEMBA) Part 2: Methodology and Results, Ecological Economics, 73, 158-167. **Impact factor: 6.5**
52. **Dale, M.**; Krumdieck, S. and Bodger, P. (2011) Net Energy Yield from Production of Conventional Oil. Energy Policy, 39 (11), 7095-7102. **Impact factor: 7.6**
53. **Dale, M.**; Krumdieck, S. and Bodger, P. (2011) A Dynamic Function for EROI, Sustainability, 3 (10), 1972-1985. **Impact factor: 3.9**
54. Murphy, D. J.; Hall, C. A. S.; **Dale, M.** and Cleveland, C. (2011) Order from Chaos: A Preliminary Protocol for Determining the EROI of Fuels, Sustainability, 3 (10), 1888-1907. **Impact factor: 2.1**
55. Brandt, A.R.; **Dale, M.** (2011) A General Mathematical Framework for Calculating Systems- Scale Efficiency of Energy Extraction and Conversion: Energy Return on Investment (EROI) and Other Energy Return Ratios. Energies, 4, 1211-1245. **Impact factor: 2.7**
56. **Dale, M.**; Krumdieck, S. and Bodger, P. (2010) Global Energy Modelling - a Biophysical Approach, World Energy Congress XXI
57. **Dale, M.**; Krumdieck, S.; Page, S.; Mulligan, K. and Rendall, S. (2008) An Ecological Approach to Community-Based Sustainable Development, 3rd International Conference on Sustainability Engineering and Science
58. **Dale, M.**; Krumdieck, S.; Page, S.; and Mulligan, K. (2008) TransitionScape: Generating Community-Based Sustainable Transport Initiatives, NERI Energy Transport and Sustainability Symposium

Monographs:

1. Heun, M. K.; Carbajales-Dale, M. and Haney, B. R. (2015) Beyond GDP: National Accounting in the Age of Resource Depletion, Springer.

Book Chapters:

1. **Carbajales-Dale, M.** (2023) Life cycle assessment: meta-analysis of cumulative energy demand and greenhouse gas emissions for wind energy technologies, in Letcher, T. ed., Wind Energy Engineering: A Handbook on On-shore Turbines, 2nd Edition, Elsevier
2. **Carbajales-Dale, M.** and King, C. (2020) Metrics in Saundry, P. and Ruddell, B. (eds.) Introduction to the Food-Energy-Water Nexus, Springer
3. **Carbajales-Dale, M.**;Eftelioglu, E.; King, C. Miralles-Wilhelm, F. R. and Ruddell, B. (2020) Questions and Scales in Saundry, P. and Ruddell, B. (eds.) Introduction to the Food-Energy- Water Nexus, Springer

Pre-tenure:

4. **Carbajales-Dale, M.** (2017) Life cycle assessment: meta-analysis of cumulative energy demand for wind energy technologies, in Letcher, T. ed., Wind Energy Engineering: A Handbook on On-shore Turbines, Elsevier.

PRESENTATIONS (* = a Clemson student or other mentee, e.g., post-doc)

Given 33 invited talks (13 since tenure), 28 conference presentations (2 since tenure), and organized or chaired 16 conference sessions (6 since tenure)

Invited talks:

Since tenure:

1. Carbajales-Dale, M. and Bergerson, J. (2024) LCA for Emerging Technologies, ACLCA Technical Committee Working Groups Status Updates, Virtual Meeting, June 2024
2. Carbajales-Dale, M. (2024) Energy-Economy-Environment (E3) Systems Analysis, SC Society of Professional Engineers, Monthly Meeting, Greenville SC, January 8th, 2024
3. Carbajales-Dale, M. (2023) The environmental and moral implications of human space travel, SESA Conference 2023 Islands in Space: From Skylab to Gateway, Virtual Meeting, Sept 22nd, 2023
4. **Carbajales-Dale, M.** (2023) Energy-Economy-Environment (E3) Systems Analysis, *LCA in Academia Series, American Center for Life Cycle Assessment (ACLCA)*, Virtual Meeting, Sept 12th, 2023
5. **Carbajales-Dale, M.** (2023) Energy-Economy-Environment (E3) Systems Analysis, KAUST Sustainability of Energy and Industrial Systems, Virtual Meeting, July 12th, 2023
6. **Carbajales-Dale, M.** (2023) Energy-Economy-Environment (E3) Systems Analysis, Battelle Savannah River Alliance Collaboration Exchange, Georgia Cyber Center, Augusta GA, June 22nd, 2023
7. **Carbajales-Dale, M.** (2023) Energy-Economy-Environment (E3) Systems Analysis, Battelle Savannah River Alliance Board Meeting, Clemson University, Clemson SC, May 23rd, 2023
8. **Carbajales-Dale, M.** and Bergerson, J. (2023) LCA for Emerging Technologies Working Group Status Update, SETAC/ACLCA North-American LCA Interest Group Working Groups Status Updates, Virtual Meeting, April 2023, https://www.youtube.com/watch?v=3X2fmTeAfck& list=PL1v8g7CqkgIJq-pJYTPCXyFugK4PCPQme&index=4
9. **Carbajales-Dale, M.** (2023) Energy-Economy-Environment (E3) Systems Analysis, Battelle Savannah River Alliance Computing Exchange, Virtual Meeting, March 30th, 2023
10. **Carbajales-Dale, M.** (2022) LCA for Emerging Technologies, EarthShift Global Webinars, Virtual Meeting, December 1st 2022, https://www.youtube.com/watch?v=9VbtGXnjfrU
11. **Carbajales-Dale, M.** and Bergerson, J. (2021) LCA for Emerging Technologies Working Group Status Update, SETAC/ACLCA North-American LCA Interest Group Working Groups Status Updates, Virtual Meeting, December 2021, https://www.youtube.com/watch?v=3X2fmTeAfck& list=PL1v8g7CqkgIJq-pJYTPCXyFugK4PCPQme&index=4
12. **Carbajales-Dale, M.** and Sherwood, J.* (2021) BaSKET: Building a Strategy for Key Energy Transitions, University of Texas Energy Symposium, Virtual Meeting, September 7th 2021, https://www.youtube.com/watch?v=nLuRcbwDd4E
13. **Carbajales-Dale, M.** and Bergerson, J. (2021) LCA for Emerging Technologies Working Group Status Update, SETAC/ACLCA North-American LCA Interest Group Working Groups Status Updates, Virtual Meeting, April 2021, https://www.youtube.com/watch?v=JdbvrRsmnRY& list=PL1v8g7CqkgIJq-pJYTPCXyFugK4PCPQme&index=2

Pre-tenure:

14. High, K.; **Carbajales-Dale, M.**; Smith, J.; Moni, S.* and Mahmud, R.* (2018) Sustainability Evaluation and Sustainable Process Design, Eastman Chemical, Kingsport, TN, April 23rd, 2018
15. **Carbajales-Dale, M.** (2018) Energy-Economy-Environment Systems Analysis, Sierra Club Up- state Chapter Meeting, March 7th, 2018
16. **Carbajales-Dale, M.** (2017) Beyond GDP: National Accounting in the Age of Resource
17. Depletion, INFORMS Annual Meeting, Houston TX, October 23rd, 2017 2016
18. **Carbajales-Dale, M.** (2016) An overview of energy-economy-environment (E3) systems anal- ysis, Basque Centre for Climate Change (BC3), June 2nd, 2016
19. **Carbajales-Dale, M.**; Barnhart, C. J.; Brandt, A. R. and Benson, S. M. (2015) A better currency for investing in a sustainable future, GCEP Net Energy Analysis Workshop, Stanford CA, March 31st-April 1st
20. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2015) Fueling the energy transi- tion: the net energy perspective, GCEP Net Energy Analysis Workshop, Stanford CA, March 31st-April 1st
21. Heun, M. K.; **Carbajales-Dale, M.** and Haney, B. R. (2015) Beyond GDP: National Accounting in the Age of Resource Depletion, Calvin College, February 27th 2015

Prior to Clemson:

22. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2014) Fueling the energy transition: the net energy perspective, UC Berkeley, May 22nd 2014
23. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2014) Fueling the energy transition: the net energy perspective, Environmental Engineering & Earth Sciences departmental seminar, Clemson University, April 10th 2014
24. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2014) Fueling the energy transition: the net energy perspective, Institute of Environmental Sciences (CML), Leiden University, Holland, March 17th 2014
25. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2013) Fueling the energy transition: the net energy perspective, Tesla Motors, Palo Alto, CA, October 4th 2013
26. **Carbajales-Dale, M.**; Barnhart, C. J. and Benson, S. M. (2013) Fueling the energy transition: the net energy perspective, Global Energy Systems 2013, Edinburgh, Scotland, June 26th- 28th, 2013 http://glocast.com/webcasts/global energy systems conference 2013/3.5 Michael Dale.html
27. **Dale, M.** and Benson, S. M. (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? GCEP Annual Symposium, October 11th 2012, http://gcep.stanford.edu/events/symposium2012/presentations.html
28. **Dale, M.** and Benson, S. M. (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? Stanford Student Energy Lectures, July 23rd 2012
29. **Dale, M.** and Benson, S. M. (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? GCEP Management Committee Meeting, May 15th 2012
30. **Dale, M.** and Benson, S. M. (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? Stanford Energy Seminar, April 2nd 2012, http://energyseminar.stanford.edu/node/431
31. **Dale, M.** and Benson, S. M. (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? Energy Resources Engineering departmental seminar, Stanford University, January 17th 2012
32. **Dale, M.**; Krumdieck, S. and Bodger, P. (2010) Global Energy Modelling - a Biophysical Approach, Mechanical Engineering departmental seminar, Canterbury University, New Zealand, June 16th 2010
33. **Dale, M.**; Krumdieck, S. and Bodger, P. (2008) Global Energy Modelling - a Biophysical Approach, Mechanical Engineering departmental seminar, Canterbury University, New Zealand, November 12th 2008

Conference talks:

Since tenure:

1. **Ijeoma, M.**, **Carbajales-Dale, M.**, Ross, B., Layton, P., Stoner, M., Albright, D., Pang, W. (2024) Development of an Entirely Wood Floor System Designed for Biogenic Carbon Storage, Adaptability, and End of Life De/Re/Construction: Life Cycle Assessment, *International Mass Timber Conference*, Portland, OR, March 26-28, 2024
2. Ijeoma, M.*; **Carbajales-Dale, M.**; Ross, B.; Layton, P. and Stoner, M. (2023) Poster: Life cycle assessment of an entirely wood floor mass timber building, International Mass Timber Conference 2023, Portland, OR. March 27-29, 2023

Pre-tenure:

3. Moni, S.*; High, K.; and **Carbajales-Dale, M.** (2019) Poster: A general LCA framework for prospective environmental evaluation of emerging technologies: a case study of perovskite PV cells, International Symposium for Sustainable Systems and Technology (ISSST) 2019, Portland, OR. June 25-27th, 2019
4. Mahmud, R.*, **Carbajales-Dale, M.**, High, K. (2019) Integration of TEA and LCA - A Case Study of wastewater treatment using anaerobic membrane bioreactor (AnMBR), ISSST, Portland, Oregon, June 25-27th, 2019
5. Sherwood, J.* (2019) 3MT: Building a Strategy for Key Energy Transitions, Resilient Infrastructure & Environmental Systems Fall Research Summit, Clemson, SC, April 24th, 2019

6. Moni, S.*; High, K.; and **Carbajales-Dale, M.** (2019) Poster: Think before you design: A framework for life cycle assessment (LCA) of emerging technologies at early development stages, Graduate Research and Discovery Symposium, Clemson University, Clemson, SC. April 3rd, 2019
7. Sherwood, J.* (2019) 3MT: Building a Strategy for Key Energy Transitions, Department of Environmental Engineering & Earth Sciences seminar series, Clemson, SC, January 11th, 2019
8. Sherwood, J.* and **Carbajales-Dale, M.** (2018) Rolling Coal: The Environmental Impacts of Coal Rail Transport for Electricity Generation, American Geophysical Union Fall Meeting, Washington, D.C. December 10-14th, 2018
9. Boyer, D. M., Shuller-Nickles, L., **Carbajales-Dale; M.**, Smith, F. N., Hanna, A., Hoover, M., Godsey,K., Moysey, S.M.(2018) Navigating Design Bias in the Research and Development of an Energy Management Game-Based Simulation. Poster session presented at the Annual Convention of the Association for Educational Communications and Technology, Kansas City MO, October 23rd-27th, 2018
10. Moni, S.*; High, K., and **Carbajales-Dale, M.** (2018) A Scale-up Framework for Life Cycle Assessment (LCA) of Emerging Technologies, International Symposium on Sustainable Systems and Technologies (ISSST) 2018, Buffalo, NY, June 26-28th, 2018
11. Karimi, H.*; Eksioglu, S. D.; and **Carbajales-Dale; M.** (2017) A Stochastic Multi-objective Optimization Model to Analyze the Economic and Environmental Impacts of Biopower Supply Chains, INFORMS Annual Meeting, Houston TX, October 23rd, 2017
12. Sherwood, J.*; Bickhart, R.*; and **Carbajales-Dale, M.** (2017) The Thermal Coal Transportation Story: A Processed Based Supply Chain LCA, LCA XVII, Portsmouth, NH, October 3rd-5th, 2017
13. Karimi, H.*, Eksioglu, Sandra D., and **Carbajales-Dale, M.** (2017) A Biobjective Optimization Model for Analyzing the Environmental and Economic Impacts of Biopower Supply Chains. IISE Annual Conference & Expo, Pittsburgh, PA, May 20th, 2017
14. **Carbajales-Dale, M.** (2016) Lifecycle Assessment and Net Energy Analysis: birds of a feather or uncomfortable bedfellows?, ISEE 2016. Transforming the Economy: Sustaining Food, Water, Energy and Justice, Washington DC, June 29th, 2016
15. Panelist: S-A5 Metrics for Food-Energy-Water Projects (2016) 16th National Conference and Global Forum on Science, Policy and the Environment: The Food-Energy-Water Nexus, Washington DC, January 19th-21st, 2016
16. **Carbajales-Dale, M.** (2015) Lifecycle Assessment and Net Energy Analysis: birds of a feather
17. or uncomfortable bedfellows?, LCA XV 2015, Vancouver, BC, October 6th-8th, 2015
18. **Carbajales-Dale, M.** (2015) Beyond GDP: National Accounting in the Age of Resource De- pletion, CANUSSEE 2015. Pathways for Change: Towards a Just and Sustainable Economy, Vancouver, BC, October 1st-4th, 2015
19. **Carbajales-Dale, M.** (2015) Beyond GDP: National Accounting in the Age of Resource Depletion, Engineering Sustainability 2015: Innovation and the Triple Bottom Line, Pittsburg, PA, April 19th-21st, 2015

Prior to Clemson:

20. **Carbajales-Dale, M.** (2013) Net Energy Analysis & Energy Return on Investment, World Future Conference, Chicago, IL ,July 20th-21st, 2013
21. **Dale, M.** (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? EcoSummit, Columbus, OH, September 30th-October 5th, 2012
22. **Dale, M.** (2012) The Energy Balance of the Photovoltaic (PV) Industry - Is the PV Industry a Net Energy Provider? 34th International Geological Congress, Brisbane, Australia, August 5th-10th, 2012
23. **Dale, M.** (2011) Net energy yield of renewable energy resources. Biophysical Economics Conference (3rd), April 15th-16th 2011 2010
24. **Dale, M.**; Krumdieck, S. and Bodger, P. (2010) Global Energy Modelling - a Biophysical Approach, World Energy Congress XXI, Montreal, Canada, September 12th-16th, 2010
25. **Dale, M.**; Krumdieck, S. and Bodger, P. (2009) Global Energy Modelling - a Biophysical Approach, Massey University Centre for Energy Research (MUCER) Conference, Massey University, Wellington, New Zealand, November 26th-27th, 2009
26. **Dale, M.**; Krumdieck, S.; Page, S.; Mulligan, K. and Rendall, S. (2008) An Ecological Approach to Community-Based Sustainable Development, 3rd International Conference on Sustainability Engineering and Science, Auckland, New Zealand, December 9th-12th, 2008

27. **Dale, M.**; Krumdieck, S.; Page, S.; and Mulligan, K. (2008) TransitionScape: Generating Community-Based Sustainable Transport Initiatives, NERI Energy Transport and Sustain- ability Symposium, Wellington, New Zealand, June 26th-27th, 2008
28. **Dale, M.**; Krumdieck, S.; Page, S.; Mulligan, K. and Rendall, S. (2008) An Ecological Approach to Community-Based Sustainable Development, MUCER Conference, Massey University, Wellington, New Zealand, June 3rd-5th, 2008

Conference session chair:

Since tenure:

1. Bergerson, J.; Posen, D. and **Carbajales-Dale, M.** (2023) Pre-Conference 1: LCA for Emerging Technologies, *30th International Symposium on Sustainable Systems and Technology – ISSST 2023*, Fort Collins, CO, June 12th, 2023
2. Bergerson, Joule; **Carbajales-Dale, Michael**; Moni, Sheikh*; Kirchofer, Abby; Shah, Ketan; Liddell, Heather; Posen, Daniel; MacLean, Heather; Miller, Shelie; Vipparla, Naveen; Cresko, Joe (2022) Special Session: Life Cycle Assessment of Emerging Technologies: Update on the SETAC/ACLCA Working Group Progress, American Center for Life Cycle Assessment (ACLCA) 2022 Conference, Virtual, November 7-11, 2022
3. Bergerson, Joule; **Carbajales-Dale, Michael**; Moni, Sheikh*; Kirchofer, Abby; Shah, Ketan; Liddell, Heather; Posen, Daniel; MacLean, Heather; Miller, Shelie; Vipparla, Naveen; Cresko, Joe (2022) Special Session: Life Cycle Assessment of Emerging Technologies: Update on the SETAC/ACLCA Working Group Progress, International Symposium on Sustainable Systems and Technologies (ISSST) 2022, Pittsburgh, PA, June 21-23, 2022
4. Bergerson, Joule; **Carbajales-Dale, Michael**; Moni, Sheikh*; Kirchofer, Abby; Shah, Ketan; Liddell, Heather; Posen, Daniel; MacLean, Heather; Miller, Shelie; Vipparla, Naveen; Cresko, Joe (2022) Special Session: Life Cycle Assessment of Emerging Technologies: Update on the SETAC/ACLCA Working Group Progress, Global CO2 initiative Carbon Capture Use and Storage (CCUS) Workshop 2022, Ann Arbor, MI, May 19-20, 2022
5. **Carbajales-Dale, Michael**; Bergerson, Joule; Moni, Sheikh*; Kirchofer, Abby; Shah, Ketan; Liddell, Heather; Posen, Daniel; MacLean, Heather; Miller, Shelie; Vipparla, Naveen; Cresko, Joe (2021) Life Cycle Assessment of Emerging Technologies: Current State, Challenges and Recommendations, American Center for Life Cycle Assessment (ACLCA) 2021 Conference, Virtual, September 21-24, 2021.
6. Bergerson, Joule; **Carbajales-Dale, Michael**; Sleep, Sylvia; MacLean, Heather; Miller, Shelie; Posen, Daniel; Morrow, William; McCoy, Sean; Jaramillo, Paulina; Cresko, Joe (2020) Life Cycle Assessment of Emerging Technologies: The case for a sub-discipline research network, American Center for Life Cycle Assessment (ACLCA) 2020 Conference, Virtual, September 22-24, 2020.

Pre-tenure:

7. **Carbajales-Dale, M.**; Bergerson, J.; Johnson, J.; Seager, T.; Morrow III, W.; Cresko, J.; McManus, M.; McCoy, S.; Williams, E.; Posen, D.; Maclean, H.; Heath, G.; Skone, T.; Brandt, A.; Matthews, S.; Miller, S.; Cucurachi, S.; Prado, V.; Carlson, D.; Wang, M.; Shehabi, A. and Carpenter, A. (2019) Building a Community for LCA of Emerging Technologies, International Symposium on Sustainable Systems and Technologies (ISSST) 2019, Portland, OR, June 25- 28th, 2019
8. Bergerson, J.; Skone, T.; Cresko, J.; McCoy, S.; Morrow, W.; **Carbajales-Dale, M.**; MacLean, H. and Shehabi, A. (2018) The Intersection of Life Cycle Assessment and Techno-Economic Analysis of Emerging Technologies, International Symposium on Sustainable Systems and Technologies (ISSST) 2018, Buffalo, NY, June 26-28th, 2018
9. McManus, M.; Seager, T.; Williams, E.; Bergerson, J.; Morrow, W.; MacLean, H.; **Carbajales- Dale, M.**; Skone, T.; Wang, M.; Posen, D.; Cresko, J.; Miler, S.; Matthews, S.; Brandt, A.; McCoy, S.; Marriott, J. and Heath, G. (2018) Life Cycle Assessment of Emerging Technologies: The case for a sub-discipline research network, International Symposium on Sustainable Systems and Technologies (ISSST) 2018, Buffalo, NY, June 26-28th, 2018
10. SS-08: Special Session: Case Studies on the Prospective Analysis of Emerging Technologies (2017) LCA XVII, Portsmouth NH, October 3rd-5th, 2017

11. SS-13: Special Session: Towards a framework for LCA of Emerging Technologies (2017) LCA XVII, Portsmouth NH, October 3rd-5th, 2017
12. Developing Robust Methods for Prospective Life Cycle Assessment for Early-Stage Technologies (2016) LCA XVI, Charleston, SC, September 27th-29th, 2016
13. Wealth Dynamics - Statistical/Mathematical Economics (2016) ISEE 2016. Transforming the Economy: Sustaining Food, Water, Energy and Justice, Washington DC, June 26th-29th, 2016
14. WC-1 Models, Metrics and Data (2016) 16th National Conference and Global Forum on Sci- ence, Policy and the Environment: The Food-Energy-Water Nexus, Washington DC, January 19th-21st, 2016
15. Biophysical Economics - Measurement (2015) CANUSSEE 2015. Pathways for Change: Towards a Just and Sustainable Economy, Vancouver, BC, October 1st-4st, 2015
16. Modeling for Biophysical and Ecological Economics (2015) CANUSSEE 2015. Pathways for Change: Towards a Just and Sustainable Economy, Vancouver, BC, October 1st-4st, 2015

SPONSORED RESEARCH

Over **one hundred** proposals (46 since tenure) totaling over **$200M** ($108M since tenure), leading to **$38M** ($30M since tenure) in awards. My share of awarded projects is **$5.3M** ($3.7M since tenure). I currently have a further **$15M** of proposals under review, of which my share is over **$3M**. Funding agencies include US Dept. of Energy (DOE), US Environmental Protection Agency (EPA), US National Science Foundation (NSF), US National Oceanic and Atmospheric Administration (NOAA), US Dept. of Agriculture (USDA), US National Aeronautics and Space Administration (NASA), and US Dept. of Education (DoEd).

Current Funding:

- 2023-2027: NRT-AI: Harnessing AI for Inverse Design Training in Advanced and Sustainable Composites (IDeAS Composites), NSF, **$3,000,000 (7% credit)**
- 2023-2027: From blue-gray to blue-green: facilitating the transition to non-plastic natural material use within the coastal zone economy, NOAA Sea Grant, **$2,619,856 (10% credit)**
- 2023-2027: A Controlled Environment Agriculture Platform for Cultivation of Salt-Tolerant Crops with Integrated Saline Water Irrigation and Salinity Management, USDA, $**9,999,987 USD (8% credit)**
- 2023-2025: Climate Resilient Sustainable Food Production: Controlled Environment Hydroponic Agriculture with Novel Wastewater Treatment & Reuse, NSF, **$1,500,000 (12.5% credit)**
- 2022-2026: Artificially Intelligent Manufacturing Paradigm for Composites (AIM for Composites), DOE, **$9,309,115 (13% credit)**
- 2022-2024: Pollution Prevention in South Carolina Chemicals Industries, EPA, **$350,000 (33%)**
- 2022-2025: An Entirely Wood Floor System Designed for Biogenic Carbon Storage, Adaptability, and End of Life De/Re/Construction, DOE, **$1,042,932 (10% credit)**
- 2022-2025: An Inverse Design Methodology to Fabricate Low-Cost Agile Tools for Manufacturing Lightweight Automotive Components, DOE, **$4,000,000 (15% credit)**
- 2021-2022: Methane as a Source of Income for South Carolina Agribusinesses and Farmers: Technical and Economic Feasibility Study, SC Agribusiness Center for Research and Entrepreneurship (SC ACRE), **$50,000 (49% credit)**
- 2021-2024: Coupling Life-Cycle Impact Assessment and Risk Assessment for Sustainability- Informed Decision Making, US Nuclear Regulatory Commission (NRC), **$499,859 (30% credit)**
- 2020-2022: Pollution Prevention in South Carolina Metals Industries, EPA, **$100,000 (33% credit)**
- 2019-2022: Peroxide-Producing Microbial Fuel Cells for Space Life Support Systems Applications, NASA, **$750,000 (10% credit)**
- 2018-2020: Source Reduction Training for South Carolina Manufacturers, EPA, **$123,043 (33% credit)**

Prior Funding:

- 2018-2019: Enabling Industry 4.0 for Multi-tiered Quality and Process Control in Precision Manufacturing of Composites, South Carolina Research Authority (SCRA) **$100,000 (5% credit)**
- 2017-2020: Graduate Research Fellowship: John Sherwood, NSF, **$138,000 (100% credit)**
- 2016-2021: Industrial Assessment Center: Energy efficiency for the growing South Carolina manufacturing industries, DOE, **$1,511,076 (25% credit)**

- 2016-2021: NRT-DESE: Preparing Resilient + Operationally Adaptive Communities through an Interdisciplinary Venture-based Education (PROACTIVE), NSF, **$2,999,965 (22% credit)**
- 2017-2019: Pollution Prevention (P2) through an Economy-Energy-Environment (E3) Partner- ship in South Carolina, EPA, **$196,596 (33% credit)**
- 2016-2019: Energize! An interactive evaluation tool for disseminating complex systems informa- tion to the general public, DOE, **$799,999 (30% credit)**
- 2015-2018: Model Validation Analytics in Support of High-Consequence Decision Making,
- DoEd, **$1,229,816 (4% credit)**
- 2015-2017: Pollution Prevention (P2) through an Economy-Energy-Environment (E3) Partnership in South Carolina, EPA, **$160,000 (33% credit)**

GRADUATE STUDENT ADVISING

Graduated 3 PhD students and **9 MS** students as committee chair. Served on the committee of 10 PhD and 7 MS graduates. I currently chairing 4 PhD students and 3 MS students committees and serving on 4 PhD and 2 MS student committees.

Doctoral Graduates:

Since tenure:

- Roksana Mahmud (PhD) Integration of Techno-Economic Analysis (TEA) and Life Cycle Assessment (LCA) for Sustainable Process Design, 5/2022, (Co-Chair)
- Ao Xie (PhD) - Microbial fuel cells for wastewater treatment, 5/2021, (Committee Member)
- John Sherwood (PhD) Building a Strategy for Key Energy Transitions: Modeling Biophysical Economics, 8/2020, (Chair)
- Rakesh Iyer (PhD) Thermoelectrics: Ecological Profile and Fundamental Principles for Sustainability, 8/2020 (Committee Member)

Pre-tenure:

- Sheikh Moni (PhD) A Framework for Life Cycle Assessment (LCA) of Emerging Technologies at Low Technology Readiness Levels, 5/2020, (Co-Chair)
- Watcharapol Pumkaew (PhD) Joint Management of Biofuel Production and Food Production to Optimize Energy Return to Land Use in Thailand: A Regional Mathematical Programming Approach, 8/2019 (Committee Member)
- Hadi Karimi (PhD) Optimization Models for Sustainable Design and Management of Biopower Supply Chains, 5/2018, (Committee Member)
- Kitiluk Thanomboonchai (PhD) Sustainable solar energy development in Thailand, 8/2017 (Committee Member)
- Amir Ahmed Asif (PhD) Manufacturing of Photovoltaic Devices, Power Electronics and Batteries for Local Direct Current Power Based Nanogrid, 5/2017, (Committee Member)

Masters Graduates:

Since tenure:

- Yash Srivastava (MS) MYSTEERIO: Multi-Regional Environmentally Extended Input-Output Model for United States, 12/2022, (Chair)
- Danielle Larsen (MS) - An Evaluation of Energy Consumption Comparing Conventional Water Treatment Plants to Microfiltration and Ultrafiltration Water Treatment Plants, 8/2022, (Committee Member)
- Vikas Garg (MS) Bilevel and Multi-objective Optimization of Electricity Price Setting with Carbon Emission Consideration, 8/2020, (Committee Member)
- Karthikeyan Karunanithi (MS) 5/2021, (Supervisor)
- Akshay Shah (MS) 5/2021, (Supervisor)
- Akash Ramdas Katkar (MS) 5/2021, (Supervisor)
- Sanjana Narayana (MS) 5/2021, (Supervisor)
- Akhil Gopireddy (MS) 5/2021, (Supervisor)

- Lingyun Peng (MS) 5/2021, (Supervisor)
- Manil Shah (MS) 5/2021, (Supervisor)
- Meet Malkan (MS) 5/2021, (Supervisor)
- Ankit Shah (MS) 5/2021, (Supervisor)
- Akshita Patlolla (MS) 5/2021, (Supervisor)
- Ishan Doshi (MS) 5/2021, (Supervisor)

Pre-tenure:

- Cole Roberts (MS) Analysis of hexavalent chromium in South Carolina industries, 5/2020, (Chair)
- Satvik Dhumal (MS Non-thesis), 5/2020, (Chair)
- Sankeerthana Panicker (MS) 5/2020, (Supervisor)
- Prina Diddee (MS) 5/2020, (Supervisor)
- Prachi Muttha (MS) 5/2020, (Supervisor)
- Parthiva Mondrety (MS) 5/2020, (Supervisor)
- Deeksha Narayan (MS) 5/2020, (Supervisor)
- Rohith Varma Nandimandalam (MS) 5/2020, (Supervisor)
- Murgesh Awati (MS) 5/2020, (Supervisor)
- Chakara Madhusudanan (MS) A Machine Learning Framework for Energy Consumption Prediction, 8/2019, (Committee Member)
- Harsh Shah (MS) 5/2019, (Supervisor)
- Aashay Mahesh Mehta (MS) 5/2019, (Supervisor)
- Ashley Martin (MS) 5/2019, (Supervisor)
- Digvijay Redekar (MS) 5/2019, (Supervisor)
- Shangarab Bera (MS) 5/2019, (Supervisor)
- Lakshana Nagaraj (MS) 5/2019, (Supervisor)
- Henry Busch (MS) Capturing, Mapping, and Analyzing Clemson University's Academic Building Utility Consumption, 5/2018 (Chair)
- Ted Langlois (MS) A Visual Data Analysis of the Toxics Release Inventory, 8/2018, (Co-Chair)
- Robert Bickhart (MS Non-thesis) 5/2018, (Committee Member)
- Raeanne Clabeaux (MS) Building a Carbon Footprint of Clemson University's Main Campus, 8/2017, (Chair)
- Elizabeth Miller (MS Non-thesis), 5/2017, (Committee Member)
- Zikai Zhou (MS) Meta-Analysis of Life Cycle Assessment Studies on Solar Photovoltaic Systems, 8/2016 (Chair)
- Kayla Quinter (MS) Evaluating Water Withdrawals and Water Availability for Projected Thermoelectric Power Growth in the Eastern Interconnection of the United States, 8/2016, (Committee Member)
- Ben Douglass (MS Non-thesis) 5/2016, (Chair)

Current Advising:

Doctoral:

- Shohreb Kamyab (PhD) LCA of desalinated water use in controlled environment agriculture, 5/2027, (Chair)
- Hao Chen (PhD) Energy-economy-environmental analysis of fiber-reinforced polymer composites, 5/2026, (Chair)
- Muzan Ijeoma (PhD) Life cycle assessment of mass-timber building systems, 5/2026, (Chair)
- Sofia Paz (PhD) Climate Resilient Sustainable Food Production, 5/2026 (Committee Member)
- Jianing Bao (PhD) Indoor air quality modeling, 5/2025, (Committee Member)
- Jacob Arnold (PhD) Resilience analysis of energy infrastructure systems, 12/2024, (Chair)
- Bryanna Wattier (PhD) Coupling Life Cycle Impact Assessment and Risk Assessment for Sustainability-Informed Decision Making, 12/2024, (Committee Member)
- Snowil Lopes (PhD) Computer-aided decision-making, 12/2024, (Committee Member)

Masters:

- John Mark Asare (MS) LCA of non-plastic alternatives for use within the coastal zone, 8/2026, (Chair)
- Raquel Jordan (MS) LCA of hydroponic agriculture, 5/2025, (Chair)

- Harish Lakshmi Srinivasan (MS) LCA of algal pathways for wastewater treatment, 12/2024, (Chair)
- Abel Binoy Matthew (MS) Wastewater treatment using membranes, 12/2024, (Committee Member)

TEACHING

Teach 3 full courses and co-teach a fourth course. My total teaching load for the last year was **374 student credit hours**. My average since being awarded tenure has been 280 per year. Participated in Environmental Engineering & Science (EES) program **ABET accreditation**.

Courses Taught (Beginning Fall 2014)

- EES 4860/6860, Environmental Sustainability, Fall & Spring 2014-
- EES 8200, Environmental Systems Analysis, Spring 2015-
- EES 8060, Process and Facility Design for Environmental Control Systems, Fall 2016-
- RIES 8730, Critical Resilient Infrastructure Systems, Spring 2021
- EES 4900:014, Creative Inquiry: Sustainability Assessments, Spring 2017
- EES 4900:022, Creative Inquiry: Industrial Assessments, Fall & Spring 2018-2021

New Course Development

- EES 4860/6860, Environmental Sustainability, Fall & Spring 2014-
- EES 8200, Environmental Systems Analysis, Spring 2015-
- RIES 8730, Critical Resilient Infrastructure Systems, Spring 2021
- EES 4900:014, Creative Inquiry: Sustainability Assessments, Spring 2017
- EES 4900:022, Creative Inquiry: Industrial Assessments, Fall & Spring 2018-2021

Prior to Clemson

- Stanford University: Think 39, Energy? Understanding the challenge, developing solutions, Fall 2013
- Stanford University: Energy 101, Energy and the Environment, Fall 2012

EMPLOYEE SUPERVISING

Current

- Serife Elif Can Sener (2020-Present) – Postdoc – Critical materials for energy transitions

Previous

- Phil Litherland (2017-2021) – Assistant Director – Industrial Assessment Center

UNDERGRADUATE RESEARCH ADVISING

Current Advising

- Christopher Garrett Lewis (2025) Hybrid solar PV systems in Nigeria
- Cole Van Emberg (2024) - LCA of electric vehicles
- Miles Jones (2024) - LCA of electric vehicles
- Johnson Vo (2024) - Industrial Assessment Center
- Frances Edwards (2025) – Industrial Assessment Center
- Matt Mytych (2025) – Industrial Assessment Center
- Luciano Sineo (2024) – Industrial Assessment Center
- Emilee Ransom (2024) – Industrial Assessment Center

Graduated since tenure

- Taylor Bogucki (2023) - LCA of electric vehicles

- Julia Feresin (2021) - Industrial Assessment Center
- Polina Stasevych (2021) - Industrial Assessment Center
- Will Arrington (2021) - Industrial Assessment Center
- Shaiane Tran (2021) - Industrial Assessment Center
- Andy Le (2021) - Industrial Assessment Center
- Zachary Hermann (2021) - Industrial Assessment Center
- Ehitohan Iyile (2021) - Industrial Assessment Center
- Jack Crocker (2021) - Industrial Assessment Center
- Jake Parker (2021) - Industrial Assessment Center
- Tom Browning Love (2021) - Industrial Assessment Center
- Meg Oterson (2020) - Industrial Assessment Center
- Jacob Wortkoetter (2020) - Industrial Assessment Center

Graduated pre-tenure

- Brittney Tsui (2019) - Industrial Assessment Center
- Jushawn Macon (2019) - Industrial Assessment Center
- Sophia Lanham (2019) - Industrial Assessment Center
- Andrew Dugan (2019) - Industrial Assessment Center
- Rachella Mariano (2019) - Industrial Assessment Center
- Jacob Patterson (2019) - Industrial Assessment Center
- Ben Snelson (2019) - Industrial Assessment Center
- Alexis Chickoree (2019) - Industrial Assessment Center
- Kevin Scrimoungchan (2018) - Industrial Assessment Center
- Mitchell Hullihen (2018) - Industrial Assessment Center
- Matthew Dayton (2018) - Industrial Assessment Center
- Kelsey Stuhn (2018) - Industrial Assessment Center
- Amanda Farthing (2017) - Honors Research: Solar PV potential for South Carolina
- Elizabeth Marrs (2017) - Industrial Assessment Center
- Thomas Garrigan (2017) - Industrial Assessment Center
- Autumn Brown (2017) - Industrial Assessment Center
- Mary Boken (2017) - Industrial Assessment Center
- Barbara Astmann (2017) - Industrial Assessment Center
- Grace Wachowski (2017) - Industrial Assessment Center
- Aaron Shephard (2017) - Industrial Assessment Center

UNIVERSITY SERVICE

University:

- University: Search Committee Member, AVP for International Programs and Partnerships (2024)
- University: Faculty Senate (2022-Present)
- University: Faculty Senate Policy Committee Member (2021-Present)
- University: Organizing Committee Chair, TigerSphere Environmental Justice Workshop (2022)
- University: Program Director, Resilient Infrastructure and Environmental Systems Program (RIES) (2020-2023)
- University: Director, Clemson Industrial Assessment Center (2017-2021)
- University: RIES Steering Committee Member (2017-2023)

College:

- College: Lead Faculty Senator (2024-Present)
- College: Faculty Senator (2022-Present)
- College: Dean's Advisory Committee (2022-Present)
- College: Search Committee, Hash Chair for Sustainable Development (2015 and 2018)

School:

- School: Research Integration Committee (2022-Present)
- Department: Undergraduate Advisor, (2017-Present)
- Department: Graduate Admissions Committee (2015-2017)
- Department: Faculty Committee (2014-Present)
- Department: Curriculum and Assessment Committee (WEAVE & ABET) (2014-Present)

MISCELLANEOUS

- Research Group's Website Page https://e3sa.sites.clemson.edu

Updated September 2024.