Adam R. Brandt

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Current Position

Associate Professor, Department of Energy Resources Engineering, Stanford University

Education

Ph.D. (2008), Energy and Resources, University of California, Berkeley
M.S. (2005), Energy and Resources, University of California, Berkeley
B.S. (2003), Environmental Studies (emphasis Physics), Highest Honors, University of California, Santa Barbara

Academic Experience

Stanford University

Associate Professor 1/1/2019 to present
Associate Professor in the Department of Energy Resources Engineering. Teaching: Courses include *Optimization of Energy Systems*, *Transitions to sustainable energy systems*, and *Fundamentals of renewable energy processes*.

Assistant Professor 7/1/2012 to 12/31/2018
Assistant Professor in the Department of Energy Resources Engineering.

Acting Assistant Professor 7/1/2009 to 6/31/2012
Acting Assistant Professor in the Department of Energy Resources Engineering.

Employment History

- 2019–Present: Associate Professor, Stanford University
- 2012–2018: Assistant Professor, Stanford University
- 2009–2012: Acting Assistant Professor, Stanford University
- 2007–2012: Expert consultancy (various, see below)
- 2003–2008: Graduate Student Researcher, University of California, Berkeley
- 2003–2008: Teaching Assistant, University of California, Santa Barbara
- 2002: Undergraduate research fellow, University of Southern California
- 2001: Development Intern, Boabab Valley Resource Reserve, Morogoro Region, Tanzania.

Academic and Professional Memberships

- American Geophysical Union
- American Chemical Society
- Society of Petroleum Engineers
- American Center for Life Cycle Assessment

Peer-reviewed publications

This list includes only peer-reviewed journal articles and peer-reviewed book chapters.

*Indicates a paper authored with an advised graduate student or post-doctoral scholar.

102. D.R. Lyon, B. Hmiel, R. Gautam, M. Omara, K. Roberts, Z.R. Barkley, K.J. David, N.L. Miles, V.C. Monteiro, S.J. Richardson, S. Conley, M.L. Smith, D.J. Jacob, L. Shen, D.J. Varon, A. Deng, X. Rudelis, N. Sharma, K.T. Story, A.R. Brandt, M. Kang, E.A. Kort, A.J. Marchese, S.P. Hamburg. Concurrent variation in oil and gas methane emissions and oil price during the COVID-19 pandemic. Atmospheric Chemistry and Physics Discussions. DOI: 10.5194/acp-2020-1175

101. S. Sleep, Z. Dadashi, Y. Chen, A.R. Brandt, H.L. MacLean, J.A. Bergerson. Improving robustness of LCA results through stakeholder engagement: A case study of emerging oil sands technologies. *Journal of Cleaner Production*. DOI: 10.1016/j.jclepro.2020.125277

100. *E.D. Sherwin, Y. Chen, A.P. Ravikumar, A.R. Brandt. Single-blind test of airplane-based hyperspectral methane detection via controlled releases. In press: *Elementa*.

99. *A.R. Brandt, H. Teichgraeber, C.A. Kang, C.J. Barnhart, M.A. Carbajales-Dale, and S. Sgouridis. Blow wind blow: Capital deployment in variable energy systems. *Energy* DOI: 10.1016/j.energy.2021.120198

98. *Nie, Y., Y. Sun, Y. Chen, R. Orsini, A.R. Brandt. PV power output prediction from sky images using convolutional neural network: The comparison of sky-condition-specific sub-models and an end-to-end model. *Journal of Renewable and Sustainable Energy* DOI: 10.1063/5.0014016

97. *Teichgraeber, H., A.R. Brandt. Optimal design of an electricity-intensive industrial facility subject to electricity price uncertainty: stochastic optimization and scenario reduction. *Chemical Engineering Research and Design* DOI: 10.1016/j.cherd.2020.08.022

96. *Kuepper, L.E., H. Teichgraeber , and A.R. Brandt. CapacityExpansion: A capacity expansion modeling framework in Julia. *Journal of Open Source Software* DOI: 10.21105/joss.02034

95. *G.A. Von Wald, M.S. Masnadi, D.C. Upham, A.R. Brandt. Optimization-based technoeconomic analysis of molten-media methane pyrolysis for reducing industrial sector CO2 emissions. *Sustainable Energy and Fuels*. DOI: 10.1039/d0se00427h

94. Teichgraeber, H., C.P. Lindenmeyer, N. Baumgartner , L. Kotzur , D. Stolten , M. Robinius, A. Bardow, A.R. Brandt. Extreme events in time series aggregation: A case study for optimal residential energy supply systems. *Applied Energy*. DOI: 10.1016/j.apenergy.2020.115223

93. *A.R. Brandt. Accuracy of satellite-derived estimates of flaring volume for offshore oil and gas operations in nine countries. *Environmental Research Communications*. DOI: 10.1088/2515-7620/ab8e17.

92. Jing, L., H.M. El-Houjeiri, J.C. Monfort, A.R. Brandt, M.S. Masnadi, D. Gordon, J.A. Bergerson Carbon intensity of global crude oil refining and mitigation potential. *Nature Climate Change*. DOI: 10.1038/s41558-020-0775-3

91. *Nie, Y., S. Zhang, R.E. Liu, D.J. Roda-Stuart, A.P. Ravikumar, A. Bradley, M.S. Masnadi, A.R. Brandt, J. Bergerson, X. Bi. Greenhouse-gas Emissions of Canadian Liquefied Natural Gas for Power Generation and District Heating in China: Three Independent Life Cycle Assessments. *Journal of Cleaner Production* DOI: 10.1016/j.jclepro.2020.120701

90. A.P. Ravikumar, D. Roda-Stuart, R. Liu, A. Bradley, J. Bergerson, Y. Nie, S. Zhang, X. Bi, A.R. Brandt. Repeated leak detection and repair surveys reduce methane emissions over scale of years. *Environmental Research Letters*. DOI: 10.1088/1748-9326/ab6ae1

89. J.A. Bergerson, A.R. Brandt, J. Cresko, M. Carbajales-Dale, H.L. MacLean, H.S. Matthews, S. McCoy, M. McManus, S.A. Miller, W.R. Morrow, I.D. Posen, T. Seager, T. Skone, S. Sleep (2020). Life cycle assessment of emerging technologies: Evaluation techniques at different stages of market and technical maturity. *Journal of Industrial Ecology* 24 (1), 11-25. DOI: 10.1111/jiec.12954

88. M.S. Masnadi *, P.R. Perrier , J. Wang , J. Rutherford , A.R. Brandt. Statistical proxy modeling for life cycle assessment and energetic analysis. *Energy* DOI: 10.1016/j.energy.2019.116882

87. K.A. Klise, B.L. Nicholson, C.D. Laird, A.P. Ravikumar, A.R. Brandt, Sensor Placement Optimization Software Applied to Site-Scale Methane-Emissions Monitoring. *Journal of Environmental Engineering.* 146 (7), 04020054. DOI: 10.1061/(ASCE) EE.1943-7870.0001737

86. V. Venugopal, Y. Sun, and A.R. Brandt. Short-term solar PV forecasting using computer vision: The search for optimal CNN architectures for incorporating sky images and PV generation history. *Journal of Renewable and Sustainable Energy.* DOI: 10.1063/1.5122796

85. *Wang, J., Tchapmi, L.P., Ravikumar, A.P., McGuire, M., Bell, C.S., Zimmerle, D., Savarese, S. and Brandt, A.R.. Machine Vision for Methane Emissions Detection Using an Infrared Camera. *Applied Energy* DOI: 10.1016/j.apenergy.2019.113998

84. *Ravikumar, A.P., S. Sreedhara, J. Wang, J. Englander, D. Roda-Stuart, C. Bell, D. Lyon, I. Mogstad, B. Ratner, A.R. Brandt. Single Blind Inter-comparison of Methane Detection Technologies - Results from the Stanford/EDF Mobile Monitoring Challenge. *Elementa: Science of the Anthropocene.* DOI: 10.1525/elementa.373

83. * Teichgraeber, H., L.E. Kuepper, and A.R. Brandt. TimeSeriesClustering: An extensible framework in Julia. *Journal of Open Source Software.* DOI: 10.21105/joss.01573

82. *Levi, P., S. Davidsson Kurland, M. Carbajales-Dale, J.P. Weyant, A.R. Brandt, S.M. Benson. Macro-energetics: Toward a new discipline. *Joule.* DOI: 10.1016/ j.joule.2019.07.017

81. *Sun, Y., V. Venugopal, A.R. Brandt (2019). Short-term solar power prediction with deep learning: exploring optimal input and output configuration. *Solar energy.* DOI: 10.1016/j.solener.2019.06.041

80. *Von Wald, G.A., A.J. Stanion, D. Rajagopal, A.R. Brandt. Biomethane addition to California transmission pipelines: Regional simulation of the impact of regulations. *Applied Energy.* DOI: 10.1016/j.apenergy.2019.05.031

79. Yuan, M., H. Teichgraeber, J. Wilcox, A.R. Brandt. Design and operations optimization of membrane-based flexible carbon capture. *International Journal of Greenhouse Gas Control.* DOI: 10.1016/j.ijggc.2019.03.018

78. *Teichgraeber, H., A.R. Brandt. Clustering methods to find representative periods for the optimization of energy systems: An initial framework and comparison.*Energy* DOI: 10.1016/j.apenergy.2019.02.0

77. *Grubert, E., A.R. Brandt. Three Considerations for Modeling Natural Gas System Methane Emissions in Life Cycle Assessment. *Journal of Cleaner Production* DOI: 10.1016/j.jclepro.2019.03.096

76. *Masnadi, M.S., H.M. El-Houjeiri, D. Schunack, Y. Li, J.G. Englander, A. Badahdah, J.E. Anderson, T.J. Wallington, J.A. Bergerson, D. Gordon, S. Przesmitzki, I.L. Azevedo, G. Cooney, J.E. Duffy, G.A. Keoleian, C. McGlade, D.N. Meehan, T.J. Skone, F. You, M.Q. Wang, A.R. Brandt. Global carbon intensity of crude oil production. *Science.* DOI: 10.1126/science.aar6859

75. * Englander, J.G.; Brandt, A.R.; Conley, S.; Lyon, D.; Jackson, R.B. (2018). Aerial inter-year comparison and quantification of methane emissions persistence in the Bakken formation of North Dakota, USA. *Environmental Science & Technology.* DOI: 10.1021/acs.est.8b01665

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DOI: 10.1016/j.apenergy.2018.06.052

73. R.A. Alvarez, D. Zavala-Araiza, D.R. Lyon, D.T. Allen, Z.R. Barkley, A.R. Brandt, K.J. Davis, S.C. Herndon, D.J. Jacob, A. Karion, E.A. Kort, B.K. Lamb, T. Lauvaux, J.D. Maasakkers, A.J. Marchese, M. Omara, S.W. Pacala, J. Peischl, A.L. Robinson, P.B. Shepson, C. Sweeney, A. Townsend-Small, S.C. Wofsy, S.P. Hamburg. Assessment of methane emissions from the U.S. oil and gas supply chain. *Science*. DOI: 10.1126/science.aar7204

72. *Sun, Y., G. Szucs, A.R. Brandt. Solar PV output prediction from video streams using convolutional neural networks. *Energy & Environmental Science* 2018, DOI: 10.1039/C7EE03420B

71. *Brandt, A.R., M.S. Masnadi, J.G. Englander, J.G. Koomey, D. Gordon. Climate-wise oil choices in a world of oil abundance. *Environmental Research Letters* DOI: 10.1088/1748-9326/aaae76

70. *Ravikumar, A.P., J. Wang, M. McGuire, C. Bell, D. Zimmerle, A.R. Brandt. "Good versus Good Enough?" Empirical tests of methane leak detection sensitivity of a commercial infrared camera. *Environmental Science & Technology*. DOI: 10.1021/acs.est.7b04945

69. *Masnadi, M.S., D. Schunack, Y. Li, S.O. Roberts, A.R. Brandt, H.M. El-Houjeiri, S. Przesmitzki, M.Q. Wang. Well-to-refinery emissions and net-energy analysis of China?s crude-oil supply. *Nature Energy*. DOI: 10.1038/s41560-018-0090-7

68. *Brodrick, P.G., A.R. Brandt., L.J. Durlofsky. Operational optimization of an integrated solar combined cycle under practical time-dependent constraints. *Energy*. DOI: 10.1016/j.energy.2017.11.059

67. *Kolster, C., M.S. Masnadi, S. Krevor, N. MacDowell, and A.R. Brandt. CO_2 enhanced oil recovery: a catalyst for gigatonne-scale carbon capture and storage deployment? *Energy & Environmental Science*. DOI: 10.1039/c7ee02102j

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65. *Masnadi, M.S., A.R. Brandt. Energetic productivity dynamics of global super-giant oilfields. *Energy & Environmental Science*. DOI: 10.1039/C7EE01031A

64. *Masnadi, M.S., A.R. Brandt. Climate impacts of oil extraction increase significantly with oilfield age. *Nature Climate Change*. DOI: 10.1038/nclimate3347

63. Gvakharia, A., E.A. Kort, M.L. Smith, J. Peischl, J.P. Schwarz, A.R. Brandt, T.B. Ryerson, C. Sweeney. Methane, black carbon, and ethane emissions from natural gas flares in the Bakken Shale, ND. *Environmental Science & Technology*. DOI: 10.1021/acs.est.6b05183

62. *Ravikumar, A.P.; A.R. Brandt. Designing better methane mitigation policies: The challenge of distributed small sources in the natural gas sector. *Environmental Research Letters* 12 044023

61. Clack, C.T.M. *et al.* Evaluation of a proposal for reliable low-cost grid power with 100% wind, water, and solar *Proceedings of the National Academy of Sciences*. DOI: 10.1073/pnas.1610381114

60. Brandt, A.R. How does energy resource depletion affect prosperity? Mathematics of a minimum energy return on investment (EROI). *Biophysical Economics and Resource Quality*. DOI: 10.1007/s41247-017-0019-y

59. *Tripathi, V. and A.R. Brandt. Estimating decades-long trends in petroleum field energy return on investment (EROI) with an engineering-based model. *PLOS ONE*. DOI: 10.1371/journal.pone.0171083

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57. *Ravikumar, A.P., J. Wang, A.R. Brandt. Are optical gas imaging technologies effective for methane leak detection? *Environmental Science & Technology.* DOI: 10.1021/acs.est.6b03906

56. Cooney, G., M. Jamieson, J. Marriott, J. Bergerson, A.R. Brandt, T.J. Skone. Updating the US life cycle GHG petroleum baseline to 2014 with projections to 2014 using open-source engineering-based models. *Environmental Science & Technology* DOI: 10.1021/acs.est.6b02819

55. *Wang, J., A.R. Brandt, J. O'Donnell. Potential for use of solar energy use in the global petroleum sector. *Energy: The International Journal.* DOI: 10.1016/j.energy.2016.10.107

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53. Brandt, A.R., G.A. Heath, D. Cooley. Methane leaks from natural gas systems follow extreme distributions. *Environmental Science & Technology.* DOI: 10.1021/acs.est.6b04303

52. *Kang, C.A., A.R. Brandt, L. Durlofsky, I. Jayaweera. Assessment of advanced solvent-based post-combustion CO_2 capture processes using a bi-objective optimization technique. *Applied energy.* DOI: 10.1016/j.apenergy.2016.07.062

51. *Vafi, K. A.R. Brandt. GHGfrack: A model for estimating greenhouse gas emissions from drilling vertical and directional wells and hydraulic fracturing. *Environmental Science & Technology.* DOI: 10.1021/acs.est.6b01940

50. Peischl, J. A. Karion, C. Sweeney, E. A. Kort, M. L. Smith, A.R. Brandt, T. Yeskoo, K.C. Aikin, S.A. Conley, M. Trainer, S. Wolter, and T.B. Ryerson. Quantifying atmospheric methane emissions from oil and natural gas production in the Bakken shale region of North Dakota. *Journal of Geophysical Research - Atmospheres.* DOI: 10.1002/2015JD024631

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47. Lyon, D.R.; R.A. Alvarez; D. Zavala-Araiza; A.R. Brandt; R.B. Jackson; S.P. Hamburg (2016). Aerial surveys of elevated hydrocarbon emissions from oil and gas production sites. *Environmental Science & Technology.* DOI: 10.1021/acs.est.6b00705

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28. Brandt, A.R., G.A. Heath, E.A. Kort, F. O'Sullivan, G. Petron, S.M. Jordaan, P. Tans, J. Wilcox, A.M. Gopstein, D. Arent, N.J. Brown, R. Bradley, G.D. Stucky, D. Eardley, R. Harriss (2014). Methane Leaks from North American Natural Gas Systems. *Science* **343** 733-735. DOI:10.1126/science.1247045

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9. Brandt A.R. (2010). Review of mathematical models of future oil supply: Historical overview and synthesizing critique. *Energy* **35**(9): 3958-3974. DOI: 10.1016/j.energy.2010.04.045

8. Brandt A.R., R.J. Plevin and A.E. Farrell (2010). Dynamics of the oil transition: Modeling capacity, depletion, and emissions. *Energy: The International Journal* **35**(7): 2852-2860. DOI: 10.1016/j.energy.2010.03.014

7. Brandt, A.R., J. Boak, and A.K. Burnham (2010). Carbon dioxide emissions from oil shale derived liquid fuels, in *Oil shale: A solution to the liquid fuels dilemma*, O. Ogunsola, Editor. ACS Symposium Series 1032. American Chemical Society: Washington, D.C. DOI: 10.1021/bk-2010-1032.ch011

6. Sorrell, S., J. Speirs, R. Bentley, A.R. Brandt, R. Miller (2009). Global oil depletion: A review of the evidence. *Energy Policy* **38**(9): 5290-5295. DOI: 10.1016/j.enpol.2010.04.046

5. Brandt, A.R. (2009). Converting oil shale to liquid fuels with the Alberta Taciuk Processor: Energy inputs and greenhouse gas emissions. *Energy & Fuels* **23**(12): 6253-6258. DOI: 10.1021/ef900678d.

4. Brandt, A.R. (2008). Converting oil shale to liquid fuels: Energy inputs and greenhouse gas emissions of the Shell in situ conversion process. *Environmental Science & Technology* **42**(19): 7489-7495. DOI: 10.1021/es800531f

3. Brandt, A.R. and A.E. Farrell (2007). Scraping the bottom of the barrel: CO_2 emission consequences of a transition to low-quality and synthetic petroleum resources. *Climatic Change* **84**(3-4): 241-263. DOI: 10.1007/s10584-007-9275-y

2. Brandt, A.R. (2007). Testing Hubbert. *Energy Policy* **35**(5): 3074-3088. DOI: 10.1016/j.enpol.2006.11.004

1. Farrell, A.E. and A.R. Brandt (2006). Risks of the oil transition. *Environmental Research Letters* **1**(1). DOI: 10.1088/1748-9326/1/1/014004

Google scholar statistics

Google scholar statistics as of March 22nd, 2021:

- Citations = 6400
- h-index = 42
- i10-index =91

Technical reports and other scholarship

* Indicates a publication authored with an advised student or post-doctoral scholar.

23. G. Von Wald, A.R. Brandt, D. Rajagopal, A. Stanion. Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications. Technical Report: California Council on Science and Technology. June 2018.

22. D. Gordon, J. Feldman, J. Bergerson, A.R. Brandt, J. Koomey. The Oil-Climate Index: Assessing GHG Emission Impacts Across the Oil Value Chain. Carnegie Endowment for International Peace, Washington, D.C. 2017

21. *El-Houjeiri, H.M., A.R. Brandt *et al.* (2017). Oil Production Greenhouse Gas Emissions Estimator OPGEE v2.0a User guide & Technical documentation. March 27th 2017.

20. H. Teichgraeber, A.R. Brandt. Identifying and Evaluating New Market Opportunities with Capacity Expansion Models. Stanford Precourt Institute for Energy. Working paper, November 2017.

19. A.R. Brandt, T. Yeskoo, S. McNally, K. Vafi, H. Cai, M.Q. Wang (2015) Energy Intensity and Greenhouse Gas Emissions from Crude Oil Production in the Bakken Formation: Input Data and Analysis Methods. Argonne National Laboratory, September 2015.

18. G.A. Heath, E. Warner, D. Steinberg, A.R. Brandt. Estimating US Methane Emissions from the Natural Gas Supply Chain. Approaches, Uncertainties, Current Estimates, and Future Studies. National Renewable Energy Lab (NREL), Golden, CO (United States)

17. J.C.S. Long et al. An Independent Scientific Assessment of Well Stimulation in California. California Council on Science and Technology. 2015.

16. A. Ghandi, S. Yeh, A.R. Brandt, K. Vafi, H. Cai, M.Q. Wang, B.R. Scanlon, R.C. Reedy (2015) Energy Intensity and Greenhouse Gas Emissions from Crude Oil Production in the Eagle Ford Region: Input Data and Analysis Methods. Argonne National Laboratory, September 2015.

15. Brandt, A.R., G. Pétron (2015). Fugitive emissions and air quality impacts of US natural gas systems. *The Bridge*, National Academy of Engineering, **2015**(Summer).

14. Gordon, D., A.R. Brandt, J. Bergerson, J. Koomey (2015). Know your oil: Creating a global oil-climate index. Carnegie Endowment for International Peace, Washington, D.C.

13. S. Yeh, A. Zhao, S.D. Hogan, A.R. Brandt, J.G. Englander, D.W. Beilman et al. Past and Future Land Use Impacts of Canadian Oil Sands and Greenhouse Gas Emissions. Institute of Transportation Studies, University of California, Davis

12. *Englander, J.G., A.R. Brandt (2014). Oil sands energy intensity analysis for GREET model update. Technical Report, May 4th, 2014. Argonne National Laboratory and Stanford University.

11. *El-Houjeiri, H.M., K. Vafi, M.S. McNally, A.R. Brandt (2014). Oil Production Greenhouse Gas Emissions Estimator OPGEE v1.1 DRAFT B. User guide & Technical documentation. March 11th 2014.

10. *El-Houjeiri, H.M., M.S. McNally, A.R. Brandt (2013). Oil Production Greenhouse Gas Emissions Estimator OPGEE v1.1 DRAFT A. User guide & Technical documentation. February 23rd 2013.

9. * El-Houjeiri, H.M., A.R. Brandt (2013). Oil Production Greenhouse Gas Emissions Estimator OPGEE v1.0. User guide & Technical documentation. August 22nd 2012.

8. Brandt, A.R. (2011). Upstream greenhouse gas (GHG) emissions from Canadian oil sands as a feedstock for European refineries. Report for European Commission. January 18th, 2011, updated May 2011.

7. Sorrell, S., J. Speirs, R. Bentley, A.R. Brandt, R. Miller (2009). An assessment of the evidence for a near-term peak in global oil production. UK Energy Research Centre, 2009.

6. Brandt, A.R. (2009). Methods of forecasting future oil supply. Technical Report 6, UKERC Review of Evidence for Global Oil Depletion, UK Energy Research Centre.

5. Farrell, A.E., A.R. Brandt, S. Arons (2008). The Race for 21st Century Auto Fuels. *Physics of Sustainable Energy: Using Energy Efficiently and Producing it Renewably.* D. Hafemeister, B. Levi, M. Levine and P. Schwartz, American Institute of Physics: 235-250.

4. Brandt A.R., A.E. Farrell (2008). Dynamics of the oil transition: Modeling capacity, costs, and emissions. UC Energy Institute, Energy Policy and Economics Working Paper 021.

3. Farrell, A.E., D. Sperling, et al. (2007). A low carbon fuel standard for California, Part 1: Technical analysis. California Energy Commission, August 1st. Available from http://www.energy.ca.gov/low_carbon_fuel_standard/.

2. Farrell, A.E., D. Sperling, et al. (2007). A low carbon fuel standard for California, Part 2: Policy analysis. California Energy Commission, August 1st. Available from http://www.energy.ca.gov/low_carbon_fuel_standard/.

1. Farrell, A.E., A. Kerr, A.R. Brandt, M. Torn (2005). Research roadmap for greenhouse gas inventory methods. California Energy Commission Report #CEC-500-2005-097.

In review

* Indicates a paper authored with an advised student or post-doctoral scholar.

9. M.S. Masnadi, G. Benini , A. Milivinti , J.E. Anderson , T.J. Wallington , R. De Kleine , V. Dotti , P. Jochem , H. El-Houjeiri , A.R. Brandt. Carbon implications of global marginal oils: market-derived displacement effects of short-term demand shocks. In review: *Nature*

8. SH El Abbadi, ED Sherwin, AR Brandt, SP Luby, CS Criddle. Stranded methane to food: techno-economic analysis of methanotrophic protein production. Preprint: EarthArXiv

7. *G. Benini, A.R. Brandt, V. Dotti, and H.M. El-Houjeiri. The Marginal Oil Field. In review: *Resource and Energy Economics.*

6. *J.G. Englander, A.R. Brandt, R.B. Jackson, S. Conely, D. Lyon, R.A. Alvarez. Aerial inter-year comparison and quantification of methane leakage persistence in the Bakken formation of North Dakota USA. In review: *Elementa*

5. *A.R. Brandt, H.M. El-Houjeiri, A.A. Badahdah, M.S. Masnadi, J.C. Monfort, G. Benini, J. Bergerson, B. Caldecott, K. Gillingham, D. Gordon, M. Jakob, N. Jevney, N. Meehan, J.-M. Sun, S. Suh. Stranding of global oil reserves in a carbon constrained world. In review.

4. R. Orsini, P.G. Brodrick, L. Durlofsky, A.R. Brandt. Optimal design of solar thermal systems with storage in the context of highly variable power prices. In review: *Energy*

3. *H. Teichgraeber, A.R. Brandt, Extreme events in capacity expansion modeling: Framework for robust inclusion of rare days. In review: *IEEE Transactions on Power Systems*

2. J.S. Rutherford, E.D. Sherwin, A.P. Ravikumar, G.A. Heath, J.G. Englander, D. Cooley, D. Lyon, M. Omara, Q. Langfitt, A.R. Brandt. Closing the gap: Explaining persistent underestimation by US oil and natural gas production-segment methane inventories. Preprint submitted to EarthArXiV. In review: *Nature Communications.*

1. *L.E. Kuepper, H.Teichgraeber, N. Baumgaertner, A. Bardow, A.R. Brandt. Wind data introduce error in time series reduction for capacity expansion modeling. Submitted: *Energy & Environmental Science*

In preparation

* Indicates a paper authored with an advised student or post-doctoral scholar.

6. Y. Chen, E.D. Sherwin, E. Berman, B. Jones, A.R. Brandt. Methane emissions from the New Mexico Permian basin: assessment from hyperspectral imaging of 30,000 wells.

5. S. Sreedhara, J. Wang, A.R. Brandt. Accuracy of camera-based automated approaches to methane detection: hyperspectral detection and plume quantification.

4. *Y. Sun, A.R. Brandt. Value of short-term solar forecasts: applications to microgrids and demand charge management.

3. *J. Wang, J. Ji, L.P. Tchapmi, A.P. Ravikumar, S. Savarese, A.R. Brandt. VideoGasNet: Deep Learning for Natural Gas Methane Leak Classification Using an Infrared Camera.

2. *J. Wang, X. Gao, A.P. Ravikumar, A.R. Brandt. Techno-economic analysis of computer-vision-enabled automated natural gas leakage detection.

1. *H. Teichgraeber, A.R. Brandt, Review of methods of time series aggregation for use in energy systems optimization models

Conference Presentations and Posters

*Indicates presentation by advised student or post-doctoral scholar.

48. *J.G. Englander, A.R. Brandt. Development of a life-cycle fugitive methane emissions model utilizing device level emissions and activity factors. American Geophysical Union, December 14th 2017.

47. *D.J. Roda-Stuart, A.P. Ravikumar, A.R. Brandt. Impact of Methane Leak Detection and Repair Programs: Determining Pre- and Post-Survey Emissions Profiles December 14 2017

46. *J. Wang, A.P. Ravikumar, M. McGuire, C. Bell, L.P. Tchapmi, A.R. Brandt. Two-stream Convolutional Neural Network for Methane Emissions Quantification. American Geophysical Union, December 14th 2017.

45. *A.P. Ravikumar, J. Wang, M. McGuire, C. Bell, A.R. Brandt. Of Detection Limits and Effective Mitigation: The Use of Infrared Cameras for Methane Leak Detection. American Geophysical Union, December 14th 2017.

44. B. Nicholson, K.A. Klise, C.D. Laird, A.P. Ravikumar, A.R. Brandt. Optimization of Emissions Sensor Networks Incorporating Tradeoffs Between Different Sensor Technologies. American Geophysical Union, December 14th 2017.

43. *H. Teichgraeber, A.R. Brandt, Representative Energy Costs for Optimization of Industrial Process Design and Operations ? Systematic Comparison of Clustering Methodologies. AIChE Annual Meeting, November 1 2017, Minneapolis MN.

42. *M. Yuan, H. Teichgraeber, A.R. Brandt, J. Wilcox. Design and Operations Optimization of Membrane Separation for Flexible Carbon Capture from Natural Gas Combined Cycle Systems. AIChE Annual Meeting, October 30 2017, Minneapolis MN.

41. *M.S. Masnadi, A.R. Brandt, Greenhouse Gas Intensities and Energetic Productivity Dynamics of Giant Global Oilfields: A Life Cycle Approach. AIChE Annual Meeting, November 1 2017, Minneapolis MN.

40. *M.S. Masnadi, A.R. Brandt, D. Schunack, Y. Li. Global Oilfields Upstream Carbon Intensity Supply Curve. LCA XVII Conference, Portsmouth NH. October 4th, 2017.

39. *J.G. Englander, J. Wang, E. Lebel, A.R. Brandt, R.B. Jackson. Short-interval repeat ground-based surveys of fugitive emissions from oil production facilities in the Bakken. American Geophysical Union, December 2016.

38. *J.G. Englander, A.T. Austin, A.R. Brandt. A Case Study Examining Egypt, Nigeria, and Venezuela and their Flaring Behavior Utilizing VIIRS Satellite Data. American Geophysical Union, December 2016.

37. *J. Jagdeo, A.P. Ravikumar, E. Grubert, A.R. Brandt. A Holistic Assessment of Energy Production: Environmental, Economic, and Social Impacts of Hydraulic Fracturing in Williams County, North Dakota. American Geophysical Union, December 2016.

36. *A.P. Ravikumar, J. Wang, A.R. Brandt. Is Optical Gas Imaging Effective for Detecting Fugitive Methane Emissions?-A Technological and Policy Perspective. American Geophysical Union, December 2016.

35. *G. Melby, E. Grubert, A.R. Brandt. Perceptions of Shale Gas Development: Differences in Urban and Rural Communities. American Geophysical Union, December 2016.

34. *J.G. Englander, A.R. Brandt, R.B. Jackson, R. Alvarez, D.R. Lyon. Repeated helicopter-based surveys of fugitive hydrocarbon emissions from tight oil operations: Persistence and driving factors. American Geophysical Union, December 2016.

33. *E. Grubert, V.A. Drummond, A.R. Brandt. Fault Lines: Seismicity and the Fracturing of Energy Narratives in Oklahoma. American Geophysical Union, December 2016.

32. P.B. Kelemen, A.R. Brandt, S.M. Benson. Carbon Dioxide Removal from Air using Seafloor Peridotite. American Geophysical Union, December 2016.

31. *S. Roberts, A.R. Brandt, M. Masnadi. Improved oilfield GHG accounting using a global oilfield database. American Geophysical Union, December 2016.

30. *Optimal Design and Operation of a Semi-Closed Oxy-Combustion Combined Cycle Power Plant. 2016 AIChE Annual Meeting. November 16, 2016, San Francisco, CA.

29. *J.G. Englander, A.T. Austin, A.R. Brandt. Estimating greenhouse gas intensity of flaring emission from oil production at the field level utilizing VIIRS satellite data. LCA XVI, Charleston, SC. September 28th, 2017

28. *J.G. Englander, P.G. Brodrick and A.R. Brandt Monitoring Oilfield Operations and GHG Emissions Sources Using Object-based Image Analysis of High Resolution Spatial Imagery. American Geophysical Union, December 14th, 2015.

27. A. Gvakharia, E.A. Kort, C. Sweeney, J. Peischl, T.B. Ryerson, A.R. Brandt M.L. Smith, Quantitative airborne assessment of gas flaring combustion efficiency in the Bakken Shale. American Geophysical Union, December 14th, 2015.

26. *S. Sweeney Smith, Y. Sun, A. Calbry-Muzyka, C. Edwards, A.R. Brandt. (2015). Systems analysis of CO2 capture technologies: Developing economy-wide thermodynamic metrics. 2015 GCEP Symposium, October 13th, 2015.

25. Brandt, A.R. (2015). Using life cycle net energy metrics to assess impacts of oil resource depletion and technological change in the oil industry. LCA XV: American Center for Life Cycle Assessment, October 7th, 2015.

24. *Vafi, K., Brandt, A.R. (2015). GHGfrack: An open-source LCA model to estimate greenhouse gas emissions from hydraulic fracturing, October 7th, 2015.

23. * Grubert, E., Brandt, A.R. (2015). Methane Leakage in LCA: Quantifying the Effect of Fugitive Methane Emissions on Greenhouse Gas Inventories. LCA XV: American Center for Life Cycle Assessment, October 7th, 2015.

22. Brandt, A.R. K. Vafi, S. Yeh, M. Wang (2015). Life cycle GHG impacts of oil from hydraulically-fractured reservoirs: A first well-level engineering analysis. LCA XV: American Center for Life Cycle Assessment, October 8th, 2015.

21. Brandt, A.R. (2015). Using life cycle net energy metrics to assess impacts of oil resource depletion and technological change in the oil industry. LCA XV: American Center for Life Cycle Assessment, October 7th, 2015.

20. *Barnhart, C.J., Pellow, M., Brandt, A.R. (2015). Ideal limits to energy storage energy cost minimization. LCA XV: American Center for Life Cycle Assessment, October 7th, 2015.

19. *Roda-Stuart, D. J. Englander, A.R. Brandt, (2014). Quantifying fugitive methane emissions in the Barnett Shale: Reanalysis of an existing dataset. American Geophysical Union, December 15th, 2014.

18. *Vafi, K., A.R. Brandt, (2014). Validation of GHG estimation models for petroleum production: challenges and promises. LCA XIV, American Center for Life Cycle Assessment. October 7th, 2014.

17. *Brodrick, P.A., A.R. Brandt, L.J. Durlofsky (2013). Optimization of CCS-enabled Coal-Gas-Solar Power Generation. *Poster*. Carbon Management Technology Conference, Alexandria VA, October 20-24 2013.

16. *Kang, C.A., A.R. Brandt, L.J. Durlofsky (2012). Optimal heat integration in a coal-natural gas energy park with CO_2 capture. GHGT-11, the 11th International Conference on Greenhouse Gas Control Technologies, Kyoto, Japan, Nov. 18-22, 2012

15. *Englander, J., A.R. Brandt, (2012). Historical Life Cycle Assessment of the Carbon Intensity of Oil Sands Production: 1970-2010. Society of Environmental Toxicology and Chemistry. North America 33rd Annual Meeting. 11-15th November, 2012.

14. *Kirchofer, A., A.R. Brandt, J. Wilcox, S. Krevor, V. Priggiobe (2012). Impact of alkalinity sources on the life-cycle energy efficiency of mineral carbonation technologiees. AIChE Annual Meeting, October 31 2012.

13. *El-Houjeiri, H.M., A.R. Brandt (2012). Exploring the variation of GHG emissions from conventional oil production using an engineering-based LCA model. American Center for Life Cycle Assessment (ACLCA) LCA XII Conference. Tacoma, WA, September 27th 2012.

12. *Englander, J., A.R. Brandt, S. Bharadwaj (2012). Historical life cycle assessment of the carbon intensity of oil sands mining and upgrading: 1970-2010. American Center for Life Cycle Assessment (ACLCA) LCA XII Conference. Tacoma, WA, September 27th 2012.

11. *Kang, C.A., A.R. Brandt, L.J. Durlofsky (2012). *Impact of CO_2 Emissions Policy and System Configuration on Optimal Operation of an Integrated Fossil-Renewable Energy Park.* Carbon Management Technologies Conference, February 8th, 2012, Orlando FL.

10. Brandt, A.R. (2012). *Sources of Variability and Uncertainty in Life-Cycle Assessment (LCA) Models for Greenhouse Gas (GHG) Emissions From Canadian Oil Sands Production* Carbon Management Technologies Conference, February 9th, 2012, Orlando FL.

9. *Kirchofer, A., A.R. Brandt, J. Wilcox, S. Krevor, V. Priggiobe (2011). Impact of alkalinity sources on the life-cycle energy efficiency of CO2 mineralization technologies. American Center for Life Cycle Assessment (ACLCA) LCA XI Conference. Chicago, IL, October 5th 2011.

8. Brandt, A.R. (2011). A bottom-up mathematical framework for energy return on investment (EROI) and other energy return ratios. Biophysical Economics Conference (3rd), April 15th-16th 2011.

7. Brandt, A.R. (2010). Time-varying LCA of liquid fuels: Energy efficiency and GHG emissions consequences of oil depletion. LCA-X Conference, American Center for Life Cycle Assessment. Portland, OR, November 2010.

6. *Mulchandani, H., A.R. Brandt (2010). Oil shale as an energy resource in a CO_2 constrained world: The concept of electricity production with in-situ carbon capture (EPICC). 30th Oil Shale Symposium, Colorado School of Mines, October 2010.

5. Brandt, A.R. J. Boak, A.K. Burnham (2009) Determinants of CO_2 emissions from oil shale: The case of liquid fuel production. 29th Oil Shale Symposium, Colorado School of Mines, October 21st, 2009.

4. Brandt, A.R. (2007). "Converting Green River oil shale to liquid fuels with ATP and ICP technologies: Life-cycle comparison of energy efficiency and GHG emissions." 27th Oil Shale Symposium, Colorado School of Mines, October 17th, 2007.

3. Brandt A.R. (2006). "Testing Hubbert." Best Student Paper Award Competition at 26th North American Conference of the International Association for Energy Economics, Ann Arbor, Michigan, September 25th, 2006.

2. Farrell A.E. and A.R. Brandt (2006). "Greenhouse gas emissions from a transition to oil substitutes." Modeling the Oil Transition: A DOE/EPA Workshop on the Economic and Environmental Implications of Global Energy Transitions, April 20th to 21st, 2006. Resources for the Future, Washington DC. Available from http://cta.ornl.gov/oilTransitions/

1. Brandt, A.R. and A.E. Farrell (2005). "Scraping the bottom of the barrel: CO_2 emission consequences of a transition to low-quality and synthetic petroleum resources." 25th Annual North American Conference of the International Association for Energy Economics, Denver, Colorado, September 19th, 2005.

Invited Lectures

This list only includes accepted talks.
Invitations not accepted are not listed.
Type of talk noted in [square brackets]

45. Argonne National Laboratory/Coordinating Research Council. CRC Workshop on Life Cycle Analysis of Transportation Fuels. October 17th, 2019.

44. Dubai Energy Water Authority, Presentation for DEWA on solar forecasting. Sept 1st 2019. Dubai, UAE.

43. National Energy Technology Laboratory, Pittsburgh PA. Workshop on Global Gas Modeling effort. NETL/KeyLogic/Aramco. July 10th-11th 2019

42. MIT, Department of Civil Engineering. Invited talk in department seminar. May 8th 2019.

41. SPE Western Regional Meeting, Panel discussion: Emerging Regulatory, Stakeholder & Technology Trends in Air Quality and Climate Change, April 23-26 2019.

40. Carnegie Mellon University, Engineering and Public Policy. Department seminar. April 17th 2019.

39. Invited talk, Institute for Energy Efficiency Seminar, UC Santa Barbara. March 7th, 2019

38. INFORMS. Open-source tools for modeling GHG emissions from oil and gas operations [invited talk]. Session: Data Analytics and Renewables in Oil & Gas Production. November 4th 2018.

37. Argonne National Laboratory, CERC-CVC annual meeting. Well-to-refinery emissions and net-energy analysis of China's crude-oil supply [invited talk]. Stanford University, August 21 2018

36. 2018 Methane Emission Measurement and Control in Oil and Gas Industry Workshop. China National Petroleum Company, Beijing China [invited talk]. July 3-4 2018.

35. California Public Utilities Commission [briefing]. Biomethane blending standards. Monday June 11th 2018. San Francisco, CA.

34. ONE Future Methane & Climate Strategies Event. Talk on methane leak detection. [invited talked]. May 15th, 2018. Houston TX.

33. Mexico Institute of Petroleum. Workshop on Oil & Gas Sustainability [Plenary talk and panel]. Mexico City, Mexico. February 13th - 15th 2018.

32. Duke University, Division of Earth & Ocean Sciences [Colloquium]. Duke University, February 9th 2018.

31. CH_4 Connections [Plenary talk and panel]. Colorado State University, Fort Collins, CO. December 12th, 2017.

30. Industrial Methane Measurement Conference [Keynote talk]. U.K. National Physical Laboratory. Antwerp, Belgium. November 28th, 2017.

29. Shell Science Council [Briefing]. Houston, TX. January 18th, 2017.

28. Statoil. Invited briefing on oil carbon intensity [Briefing]. Stavanger, Norway. December 12th 2016.

27. Schlumberger. Invited briefing on methane leakage [Briefing]. Dubai, United Arab Emirates. September 29th 2016.

26. Los Alamos National Laboratory. Frontiers in geoscience [Colloquium]. Los Alamos, NM. August 8th, 2016.

25. California Air Resources Board. ARB Methane Symposium [Plenary talk and panel]. Sacramento, CA. June 6th, 2016

24. Stanford Petroleum Investments Committee [Briefing]. Napa, CA. May 13th, 2016

23. American Chemical Society: Environmental Impacts of Unconventional Oil and Gas Production & Hydraulic Fracturing [Invited talk]. San Diego, CA. March 17th, 2016.

22. UC Berkeley, Forum on environmental impacts of shale gas extraction in Mexico [Plenary talk and panel]. Berkeley, CA. April 28th, 2015.

21. Carnegie Endowment for International Peace [Plenary talk and panel]. Oil Climate Index Public Symposium. Washington, D.C., March 7th, 2015.

20. Society of Petroleum Engineers, San Joaquin Valley Branch [Colloquium]. Bakersfield, CA. March 4th, 2015.

19. Hewlett Foundation, Cynthia and George Mitchell Foundation, Funders Meeting on Methane Emissions Strategy [Briefing]. Washington, D.C., October 2nd, 2014.

18. Lockheed Martin STAR Labs [Colloquium]. Palo Alto, CA. September 25th, 2014.

17. Carnegie Endowment for International Peace. Oil Carbon Index Workshop [Plenary talk and panel]. Washington, D.C., September 18th, 2014.

16. Society of Petroleum Engineers, Low Carbon Intensity Processes for Low Mobility Oil Recovery [Plenary talk]. Newport Beach, CA, July 27th – August 1st, 2014.

15. Carnegie Mellon University, Center for Climate and Energy Decision Making [Colloquium]. March 31st 2014, Pittsburg, PA.

14. University of California Berkeley, Energy and Resources Group [Colloquium]. Invited lecture on methane leaks from natural gas systems. March 19th 2014, Berkeley, CA.

13. University of Texas, Petroleum and Geosystems Engineering Department [Colloquium]. October 28th 2013, Austin, TX.

12. Coordinating Research Council (CRC) *Workshop on Life Cycle Analysis of Biofuels* [Plenary talk and panel]. October 15th-17th, 2013 Argonne National Laboratory, Argonne, IL.

11. University of Calgary, ISEEE (Institute for sustainable energy, environment, and economy) EES Seminar. [Colloquium]. Calgary, Alberta. November 28th,2012
10. CERA Week 2012 [Invited talk and panel]. Houston, TX. March 6th, 2012.
9. Coordinating Research Council (CRC) *Workshop on Life Cycle Analysis of Biofuels*. [Plenary talk and panel] October 17th-19th, 2011. Argonne National Laboratory, Argonne, IL.
8. The Workshop on Low Carbon Fuel Standards [Plenary talk and panel]. Victoria, British Columbia, October 12th-13th, 2011.
7. European Commission, Directorate General (DG) Climate Action [Government testimony]. Brussels, Belgium. May 27, 2011
6. Center for European Policy Studies (CEPS) [Plenary talk and panel]. Brussels, Belgium. March 21st, 2011.
5. SLAC National Accelerator Laboratory [Colloquium]. February 1st, 2010.
4. Stanford University, Stanford Energy Seminar [Colloquium]. September 23rd, 2009.
3. Humboldt State University [Colloquium]. April 16th, 2009.
2. Lawrence Livermore National Laboratory [Colloquium]. Livermore, CA. February 11th 2009.
1. Stanford University, Energy Resources Engineering [Colloquium]. December 4th, 2007.

ADVISED GRADUATE STUDENTS

Post-doctoral scholars

*Denotes current student

6. *Evan Sherwin – Post-doctoral scholar, 2019 – Present
5. *Giacomo Benini – Post-doctoral scholar, 2018 – Present
4. *Mohammad Masnadi – Post-doctoral scholar, 2016 – Present
3. Arvind Ravikumar – Post-doctoral scholar, 2015–2018
2. Kourosh Vafi – Post-doctoral scholar, 2013–2016
1. Hassan El-Houjeiri – Post-doctoral scholar, 2011–2013

Ph.D. students

*Denotes current student

15. *Zhan Zhang – Ph.D. Energy Resources Engineering, Expected June 2022
14. *Rachel Orsini – Ph.D. Energy Resources Engineering, Expected June 2022
13. *Sindhu Sreedhara – Ph.D. Energy Resources Engineering, Expected June 2022
12. *Greg Von Wald – Ph.D. Energy Resources Engineering, Expected June 2022
11. *Wennan Long – Ph.D. Energy Resources Engineering, Expected June 2022
10. *Jeff Rutherford – Ph.D. Energy Resources Engineering, Expected June 2021
9. *Lin Shi (co-advised E-IPER student) – Ph.D. Environment & Resources, expected June 2021
8. *Jingfan Wang – Ph.D. Energy Resources Engineering, Expected Dec 2019

7. *Holger Teichgraeber – Ph.D. Energy Resources Engineering, Expected June 2020
6. Yuchi Sun – Ph.D. Energy Resources Engineering, 2019
5. Jacob Englander – Ph.D. Energy Resources Engineering, August 2018
4. Mengyao Yuan – Ph.D. Energy Resources Engineering, March 2018
3. Emily Grubert (co-advised E-IPER student) – Ph.D. Environment & Resources, September 2017
2. Philip Brodrick – Ph.D. Energy Resources Engineering, March 2017
1. Charles Kang – Ph.D. Energy Resources Engineering, June 2015

M.S. students (research track only)

*Denotes current student

16. Yuanlei Chen – M.S. Energy Resources Engineering, Degree Expected June 2020
15. Rachel Orsini – M.S. Energy Resources Engineering, June 2019
14. Sindhu Sreedhara – M.S. Energy Resources Engineering, June 2019
13. Vignesh Venugopal – M.S. Energy Resources Engineering, June 2019
12. Greg Von Wald – M.S. Energy Resources Engineering, June 2018
11. Daniel Roda Stuart – M.S. Energy Resources Engineering, June 2018
10. Manohar Mogadali – M.S. Energy Resources Engineering, June 2017
9. Holger Teichgraeber – M.S. Energy Resources Engineering, June 2016
8. Vinay Tripathi – M.S. Energy Resources Engineering, June 2016
7. Chandler Kemp – M.S. Energy Resources Engineering, June 2015
6. Yuchi Sun – M.S. Energy Resources Engineering, June 2015
5. Scott McNally – M.S. Energy Resources Engineering, June 2014
4. Stuart Sweeney Smith – M.S. Energy Resources Engineering, June 2014
3. Sharad Bharadwaj – M.S. Energy Resources Engineering, June 2014
2. Charles Kang – M.S. Energy Resources Engineering, June 2011
1. Hiren Mulchandani – M.S. Materials Science, June 2010

University Service

- Summer 2010 – Present: Undergraduate Advisor, School of Earth, Energy and Environmental Sciences
- Summer 2016 – Spring 2017: Search committee chair - Faculty search for Energy Resources Engineering (resulted in two offers)
- Spring 2015 – Winter 2018: Stanford Natural Gas Initiative, Focus area lead: Methane leakage
- Winter 2015 – Winter 2018: Admissions committee - Department of Energy Resources Engineering
- Fall 2014 – Winter 2015: Search committee - Faculty Search for Precourt Institute for Energy/Management Science and Engineering joint professorship

- Summer 2014: Search committee - Undergraduate program director, School of Earth Sciences, Stanford University
- December 2013 – Winter 2018: Earth Sciences Council, School of Earth Sciences, Stanford University
- November 2013 – Winter 2016: Teaching task force, School of Earth Sciences, Stanford University
- November 2013 – November 2014: Organizing committee: Connecting the Dots, Stanford University
- March 2012 – March 2014: Selection committee, Stanford Interdisciplinary Graduate Fellowship (SIGF)
- July 2010 – September 2010: Search committee, GCEP post-doctoral scholar
- July 2009 – July 2011: Leader for Wyoming CCS research project

External Service

- June 2016 – December 2017: Scientific Advisory Panel - National Renewable Energy Laboratory, Methane reconciliation project
- August 2013 – 2015: Technical steering committee: Independent Review of Scientific and Technical Information on Well Completion Technologies, Including Hydraulic Fracturing, in California. Study convened by California Council on Science and Technology
- August 2014 – Peer review for funding proposals, Sloan Foundation
- August 2011 – Present: Technical advisor to California Environmental Protection Agency, Air Resources Board
- June 2010 – June 2011: Technical advisor for European Union, Directorate General - Climate, on technical matters related to Fuel Quality Directive regulation

Service to Scientific Community

Peer review

- National Academies of Sciences: Report on Methane emissions, *Proceedings of the National Academy of Sciences*
- AAAS: *Science*
- American Chemical Society: *Environmental Science & Technology, Energy & Fuels, Sustainable Chemistry & Engineering*
- PLoS: *PLoS One*
- Elsevier: *Energy, Energy Policy, Applied Energy, International Journal of Greenhouse Gas Control, Journal of Cleaner Production*
- Springer: *International Journal of Life Cycle Assessment, Biophysical Economics and Resource Quality*