

**Sarah Marie Jordaan, B.Sc., Ph.D.**  
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**Research and teaching interests:** international trade and energy, energy policy, public policy, environmental policy, energy and environmental systems, sustainable energy, technology assessment, technology innovation.

### **Education**

2010      **Ph.D. Environmental Design**, specialization in Energy and Environmental Systems, University of Calgary, received on June 7.  
2003      **B.Sc. Physics**, Computer Science minor, Department of Physics and Physical Oceanography, Memorial University of Newfoundland.  
1998      French Bursary Program, Université de Montréal.

### **History of employment**

2016 -      **Johns Hopkins University.** Assistant Professor of Energy, Resources, and Environment, School of Advanced International Studies; Canadian Studies (2016-present); Fellow, Initiative for Sustainable Energy Policy (2018-present).  
2013 - 2016      **University of Calgary.** Assistant Professor of Energy Politics and Policy, Department of Political Science.  
2012 - 2014      **Electric Power Research Institute (EPRI).** Project Manager, Environmental and Economic Challenges and Opportunities: Shale Gas in the U.S., Environment and Renewables (2012-2013); Consultant (through June 2013); Contractor (2013-2014).  
2010 - 2012      **Harvard University.** Postdoctoral Fellow/Associate, Energy Technology Innovation Policy, J. F. Kennedy School of Government and Department of Earth and Planetary Sciences.  
2010 - 2012      **University of California, San Diego.** Associate, Laboratory on International Law and Regulation.  
2004 - 2010      **University of Calgary.** Postdoctoral Fellow/Ph.D. Candidate. Environmental Design/Institute for Sustainable Energy Economy and Environment. Transferred to Ph.D. program in 2006.  
2006      **Shell Canada Limited.** Environmental planner (coop student), Peace River oil sands project.  
2004      **Memorial University.** Science Technician, Ocean Sciences Center.  
2003 - 2004      **Carpathian Wildlife Foundation, Romania.** Young Professionals International Intern, Department of Foreign Affairs and International Trade, Government of Canada.  
2003      **Memorial University.** Research Assistant, Department of Physics.

### **Research grants, fundraising, awards, and scholarships**

- Sloan Foundation Grant, 2018 (\$65,456). Improving spatiotemporal energy infrastructure datasets for the United States, in collaboration with the National Renewable Energy Laboratory (NREL).
- Discovery Award, Johns Hopkins University, 2018-2019 (\$99,253). An Inventory of Methane Emissions from Natural Gas Infrastructure, co- PI Scot Miller.
- Outstanding Teaching Performance, Schulich School of Engineering, University of Calgary, 2015-2016.
- Life Cycle Assessment of Liquefied Natural Gas, Hydraulic Fracturing Initiative, University of Calgary, 2014-2015 (\$29,000); Canadian Association of Petroleum Producers, 2015 (\$7,500), co-PI James Coleman.
- Technical Paper Award, 2013 Canadian Renewable Fuels Summit.
- NREL-EPRI research grant (\$40,000). The Spatial Footprint of Natural Gas Fired Electricity, 2013-2015, co-PI Garvin Heath, NREL.
- Start-up Grant, University of Calgary, 2013-2015 (\$20,000).
- EPRI research project (\$600,000). Shale Gas Production in the United States: Environmental and Economic Resource Challenges and Opportunities, 2012-2013.
- Mentor of the Year, 2012 nominee. Harvard Graduate Women in Science and Engineering.
- Queen Elizabeth II Doctoral Scholarship, 2009 (\$15,000).
- Environmental Design Departmental Scholarship, 2006-2009 (\$2000-3000 each year).
- Ethics of climate change essay contest winner in Environmental Science, 2007 (\$1000).
- Dean's Entrance Award, 2006 (\$6000).
- Alberta Graduate Scholarship, 2005 (\$2000).

### Accepted articles (in press)

1. **Jordaan, S. M.**, A. Siddiqi, B. Kakenmaster, and A. Hill. The Climate Vulnerabilities of Global Nuclear Power. *Global Environmental Politics*.
2. **Jordaan, S. M.**, A. Davidson, J. Nazari, I. M. Herremans. The Dynamics of Advancing Climate Policy in Federal Political Systems. *Environmental Policy and Governance*.

### Published articles (852 citations reported by Google Scholar as of 03/23/2019)

1. **Jordaan, S. M.** and K. Konschnik. (2019) Measuring and Managing the Unknown: Methane Emissions from the Oil and Gas Value Chain. C.D. Howe Institute, Issue Brief.
2. Umeozor, E. C., **S. M. Jordaan**, and I. D. Gates. (2018) On Methane Emissions from Shale Gas Development. *Energy*, 152: 594-600.
3. **Jordaan, S. M.**, L. A. Patterson, and L. Diaz Anadon. (2018) A spatially-resolved inventory analysis of the water consumed by the coal-to-gas transition of Pennsylvania. *Journal of Cleaner Production*, 184: 366–374.
4. Kasumu, A., V. Li, J. W. Coleman, J. Liendo, **S. M. Jordaan**. (2018) Country-level Life Cycle Assessment of Liquefied Natural Gas Trade for Electricity Generation. *Environmental Science & Technology*, 52(4): 1735–1746.
5. Konschnik, K. and **S. M. Jordaan**. (2018) Reducing fugitive methane emissions from the North American oil and gas sector: a proposed science-policy framework. *Climate Policy*.
6. **Jordaan, S. M.** (2018) Resilience for power systems amid a changing climate. *Bulletin of the Atomic Scientists*, 74:2, 95–101.
7. **Jordaan, S. M.**, G. A. Heath, J. Macknick, E. Mohammadi, D. Ben-Horin, V. Urrea and D. Marceau. (2017). Understanding the life cycle surface land requirements of natural gas-fired electricity. *Nature Energy*, 2: 804–812.
8. **Jordaan, S. M.**, E. Romo-Rabago, R. McLeary, L. Reidy, J. Nazari, I. M. Herremans. (2017) The role of energy technology innovation in reducing greenhouse gas emissions in Canada. *Renewable and Sustainable Energy Reviews*, 78: 1397–1409.
9. Boersma, T. and **S. M. Jordaan**. (2017) Whatever happened to the golden age of natural gas? *Energy Transitions*, 1:5.
10. Coleman, J. W. and **S. M. Jordaan**. (2016) Clearing the Air: How Canadian LNG Exports Could Help Meet World Greenhouse Gas Reduction Goals. C.D. Howe Institute, Issue Brief.
11. Ciliberti, C., **S. M. Jordaan**, S. V. Smith, S. Spatari. (2016) A life cycle perspective on land use and project economics of electricity from wind and anaerobic digestion. *Energy Policy*, 89: 52–63.
12. Brandt, A. R., G. A. Heath, E. A. Kort, F. O'Sullivan, G. Pétron, **S. M. Jordaan**, P. Tans, J. Wilcox, A. M. Gopstein, D. Arent, S. Wofsy, N. J. Brown, R. Bradley, G. D. Stucky, D. Eardley, and R. Harriss. (2014) Methane Leaks from North American Natural Gas Systems. *Science*, 343: 733–735.
13. **Jordaan, S. M.**, L. D. Anadon, E. Mielke, D. P. Schrag. (2013) Regional water implications of reducing oil imports with liquid transportation fuel alternatives in the United States. *Environmental Science & Technology*, 47(21): 11976–11984. (Awarded Best Technical Paper at the Canadian Renewable Fuels Summit).
14. **Jordaan, S. M.** (2012) Land and water impacts of oil sands production in Alberta. *Environmental Science & Technology*, 46(7): 3611–3617.
15. Doluweera, G., **S. M. Jordaan**, M. Moore, D. W. Keith, and J. A. Bergerson. (2011) Evaluating the role of cogeneration for carbon management in Alberta. *Energy Policy*, 39: 7963–7974.
16. **Jordaan, S. M.** and M. C. Moore. (2010) Ethical risks of environmental policies: ethanol production in North America. *School for Public Policy, University of Calgary*, 3(9).
17. Yeh, S., **S. M. Jordaan**, A. Brandt, S. Spatari, M. Turetsky, D. W. Keith. (2010) Land use greenhouse gas emissions from conventional oil and oil sands production. *Environmental Science & Technology*, 44(22): 8766–8772.
18. **Jordaan, S. M.**, D. W. Keith, B. Stelfox. (2009) Quantifying land use of oil sands production: a life cycle perspective, *Environmental Research Letters*, 4: 024004.
19. **Jordaan, S. M.** (2007) Ethical risks of attenuating climate change through new energy systems: the case of a biofuel system. *Ethics in Science and Environmental Politics*, 2007: 23–29. (Essay Contest Winner, *Environmental Science*).

### Research reports and book chapters

20. Coleman, J. W., A. Kasumu, J. Liendo, V. Li, **S. M. Jordaan**. (2015) Calibrating Liquefied Natural Gas Export Life Cycle Assessment: Accounting for Legal Boundaries & Post-Export Markets, CIRL Occasional Paper #49. Canadian Institute of Resources Law.
21. Electric Power Research Institute. (2013) Shale Gas Production in the United States: Environmental and Economic Resource Challenges and Opportunities. Palo Alto, CA. 3002002014.
22. **Jordaan, S. M.**, C. Stevens, D. B. Brooks. (2009) Chapter 12, Removing institutional barriers: challenges and opportunities *in* Making the Most of the Water We Have: The Soft Path Approach to Water Management. Editors D. B. Brooks, O. M. Brandes, S. Gurman. EarthScan Publications.

### Working papers

23. Patterson, L. A., **S. M. Jordaan**, and L. Diaz Anadon. (2016) A Spatiotemporal Exploration of Water Consumption Changes Resulting from the Coal-to-Gas Transition in Pennsylvania. Nicholas Institute of Environmental Policy Solutions, Duke University and the Belfer Center for International Affairs, Harvard Kennedy School. NI WP 16-01. Durham, NC: <http://nicholasinstitute.duke.edu/publications>.
24. **Jordaan, S. M.** (2011) Governance of impacts to land and water resources from oil sands development in Alberta. Working paper series, Laboratory on International Law and Regulation, University of California, San Diego.

### Opinion articles

25. **S. M. Jordaan**. (2018) How Climate Change Threatens the US Power Supply. Expert Analysis – Opinion, for Law360: <https://www.law360.com/articles/1028436/how-climate-change-threatens-the-us-power-supply>.
26. Konschnik, K. and **S. M. Jordaan**. (2018) How to reduce methane emissions from the oil and gas industry across North America. The Conversation: <https://theconversation.com/how-to-reduce-methane-emissions-from-the-oil-and-gas-industry-across-north-america-91635>.
27. Kasumu, A., **S. M. Jordaan**, V. Li, J. W. Coleman, and J. Liendo. (2018) The Greenhouse Gas Implications of Exporting LNG from B.C. C.D. Howe Institute, Intelligence Memo: <https://www.cdhowe.org/intelligence-memos/kasumu-jordaan-li-coleman-liendo-greenhouse-gas-implications-exporting-lng-bc>.
28. **S. M. Jordaan**. (2017) From Laggard to Leader – Canada as champion of the Paris Agreement? C.D. Howe Institute, Intelligence Memo: <https://www.cdhowe.org/intelligence-memos/sarah-m-jordaan-laggard-leader---canada-champion-paris-agreement>.
29. **S. M. Jordaan** and D. Gordon. (2017) Power to the States: How Carbon Pricing Can Be a Winning Strategy Under a Trump Administration. Carnegie Endowment for International Peace, Washington DC: <http://carnegieendowment.org/2017/04/03/power-to-states-how-carbon-pricing-can-be-winning-strategy-under-trump-administration-pub-68530>.
30. Coleman, J. W. and **S. M. Jordaan**. (2016) B.C. LNG could reduce emissions overseas – if it's done correctly. Globe and Mail, Op-Ed: <https://www.theglobeandmail.com/report-on-business/rob-commentary/bc-lng-could-reduce-emissions-overseas-if-its-done-correctly/article31515914/>.

### Conference papers

31. **Jordaan, S. M.**, A. Davidson, J. Nazari, I. M. Herremans. (2017) The Influence of Global Climate Change on Energy Technology Innovation in Federal Political Systems. Association for Public Policy Analysis and Management. International Conference: Public Policy and Governance Beyond Borders, July 14 2017.
32. Cucura, J., B. Burnap, P. Gallagher, S. Spatari, **S. M. Jordaan**. (2011) Geospatial LCA of land disturbance in Pennsylvanian Marcellus Shale. Paper accepted in Life Cycle Assessment VIII Conference, American Center for Life Cycle Assessment, Chicago.
33. Doluweera, G., **S. M. Jordaan**, J. A. Bergerson, M. Moore. (2009) Cogeneration and potential for emission reductions in oil sands operations. Paper accepted in IEEE Power and Energy Society General Meeting. Calgary, AB.
34. Yeh, S., S. Spatari, **S. M. Jordaan**, and A. Brandt. (2009) Land use greenhouse gas emissions of conventional and unconventional oil production. Extended abstract published in International Association for Energy Economics, 32<sup>nd</sup> Conference. San Francisco, CA.

### Conference presentations

1. **Jordaan, S. M.** (2018) Cost-effective policy for reducing emissions from the North American oil and gas sector. American Geophysical Union, Fall 2018 meeting, Washington DC, December 12.

2. **Jordaan, S. M.**, Qingyu Xu, and B. Hobbs. (2018) Grid-scale Life Cycle Greenhouse Gas Benefits of Electricity Storage Options. Trans-Atlantic Infraday 2018, Federal Energy Regulatory Commission, Washington DC, November 1-2.
3. **Jordaan, S. M.**, L. Patterson, L. Diaz Anadon. (2018) A spatially-resolved inventory analysis of the water consumed by the coal-to-gas transition of Pennsylvania. International Sustainable Production and Consumption Conference, Institution of Chemical Engineers (IChemE), Manchester UK, October 4-6<sup>th</sup>.
4. **Jordaan, S. M.**, Qingyu Xu, and B. Hobbs. (2018). Grid-scale Life Cycle Greenhouse Gas Benefits of Electricity Storage Options. LCA XVIII, American Center for Life Cycle Assessment, Fort Collins CO, September 25-28<sup>th</sup>.
5. **Jordaan, S. M.**, L. Patterson, L. Diaz Anadon. (2018) A spatially-resolved inventory analysis of the water consumed by the coal-to-gas transition of Pennsylvania. LCA XVIII, American Center for Life Cycle Assessment, Fort Collins CO, September 25-28<sup>th</sup>.
6. **Jordaan, S. M.** (2018). The life cycle land requirements of unconventional oil and natural gas. Ecological Society of America, 2018 Annual meeting. Invited submission to Symposium "Connecting Physical, Biological, and Social Risks from High Volume Hydraulic Fracturing." New Orleans LA, August 5-10<sup>th</sup>.
7. **Jordaan, S. M.**, A. Davidson, J. Nazari, I. M. Herremans. (2017) The Influence of Global Climate Change on Energy Technology Innovation in Federal Political Systems. Association for Public Policy Analysis and Management. International Conference: Public Policy and Governance Beyond Borders, July 14<sup>th</sup>.
8. **Jordaan, S. M.** (2017) Session Chair for Panel on Scientific Research and Partnership. Association for Public Policy Analysis and Management. International Conference: Public Policy and Governance Beyond Borders, July 14<sup>th</sup>.
9. **Jordaan, S. M.**, Garvin Heath, Jordan Macknick, Ehsan Mohammadi, Dan Ben-Horin and Victoria Urrea. (2014) The Spatial Footprint of the Life Cycle of Natural Gas Fired Electricity. LCA XIV, American Center for Life Cycle Assessment. San Francisco, CA, October 6-8<sup>th</sup>.
10. **Jordaan, S. M.**, Garvin Heath, Jordan Macknick, Ehsan Mohammadi, Dan Ben-Horin and Victoria Urrea. (2014) The Spatial Footprint of the Life Cycle of Natural Gas Fired Electricity. Fracturing Impacts and Technologies Conference. Air and Waste Management Association. Lubbock, TX, September 4-5<sup>th</sup>.
11. **Jordaan, S. M.** (2014) Emissions of natural gas production systems: Current status and future research. Session 01: Shale gas strategic perspectives, 2nd International Symposium on Energy Challenges and Mechanics (ECM2). Aberdeen, Scotland, August 19-21<sup>st</sup>.
12. Davari, R., D. D. Reible, **S. M. Jordaan**. (2013) Water Quality Impacts of Shale Gas Development. Engineering Conferences International. Overcoming the Technical and Community Challenges of Hydraulic Fracturing for Shale Gas. Boulder, Colorado, August 4-8<sup>th</sup>.
13. **Jordaan, S. M.** and S. Bushart. (2013) Environmental and Economic Impact Assessment of Shale gas Production. 16th Annual Energy, Utility & Environment Conference. Presenter, session co-chair.
14. **Jordaan, S. M.**, L. Diaz Anadon and D. Schrag. (2011) Temporal aspects of water use in shale gas development: implications for LCA. LCA VIII, American Center for Life Cycle Assessment, Chicago, October 4-6<sup>th</sup>.
15. Doluweera, G., **S. M. Jordaan**, J. A. Bergerson, M. Moore. (2010) Cogeneration and potential for emission reductions in oil sands operations. USAEE/IAEE 29th North American Conference. Calgary, Alberta, Canada, October 14-16<sup>th</sup>.
16. Yeh, S., S. Spatari, **S. M. Jordaan**, D. Keith, A. Brandt, M. Turetsky. (2010) Land use greenhouse gas emissions for conventional and unconventional oil production. USAEE/IAEE 29th North American Conference. Calgary, Alberta, Canada, October 14-16<sup>th</sup>.
17. **Jordaan, S. M.** (2010) The land use footprint of energy extraction in Alberta. Technology, Management and Policy Graduate Consortium, University of Cambridge, UK, June 27-29<sup>th</sup>.
18. **Jordaan, S. M.**, D. W. Keith and B. Stelfox. (2009) Land use and habitat fragmentation of oil sands production: a life cycle perspective. LCA IX, American Center for Life Cycle Assessment. Boston, MA, September 29<sup>th</sup>-October 2<sup>nd</sup>.
19. **Jordaan, S. M.** and D. W. Keith. (2008) Accounting for land use in a life cycle framework: oil sands development in Alberta. LCA VIII, American Center for Life Cycle Assessment. Seattle, WA, September 30<sup>th</sup>-October 2<sup>nd</sup>.

#### **Invited seminars, presentations and panels**

1. **Jordaan, S. M.** (2019) Global natural gas: market evolution and life cycle greenhouse gas emissions implications for the power sector. Webinar to Pakistan, hosted by: Women Engineers, Pakistan; Women in Energy, Pakistan;

and, SAIS Women Lead. Wednesday, January 30<sup>th</sup>. Women Engineers, Pakistan reports: 3,100 people watched the webinar, and 1430 actively engaged with the content.

2. **Jordaan, S. M.** (2018) Life cycle assessment: informing decisions about energy technologies. Seminar, Johns Hopkins Center for Global NCD Research and Training, Johns Hopkins University, December 7<sup>th</sup>.
3. **Jordaan, S. M.** (2018) Life Cycle Assessment as a tool for understanding the water implications of energy decisions. Randolph Bromery Lecture Series, Department of Earth and Planetary Sciences, Johns Hopkins University, October 25<sup>th</sup>.
4. **Jordaan, S. M.** (2018) Global natural gas: market evolution and life cycle emissions implications for the power sector. David Bradford STEP seminar series, Princeton University, October 8<sup>th</sup>.
5. **Jordaan, S. M.** (2018) Greenhouse gas implications of LNG export from British Columbia: Global to local costs and benefits, Canada LNG Conference & Exhibition, Vancouver, British Columbia, May 14<sup>th</sup>.
6. **Jordaan, S. M.** (2018) The Life Cycle Land Footprint of Energy Infrastructure. Initiative for Sustainable Energy Policy Seminar Series, Johns Hopkins University, April 26<sup>th</sup>.
7. **Jordaan, S. M.** (2018) Global natural gas: market evolution and climate implications. EPC-ESP Forum, Advanced Academic Programs, Johns Hopkins University, March 8<sup>th</sup>.
8. **Jordaan, S. M.** (2017) Liquefied Natural Gas Export: Markets and Environmental Implications. SPE Panel on Domestic and International LNG Trade and Development. Society of Petroleum Engineers, Houston TX, October 3<sup>rd</sup>, 2017. Participants: Elias Cortinas, Gas Markets Advisor, Chevron.
9. **Jordaan, S. M.** (2017) Capturing a Commodity: Reducing Emissions from Expanding Natural Gas Markets. School of Public Policy, University of Maryland, Global Sustainability Forum.
10. **Jordaan, S. M.** (2016) The Evolution of Climate Policy with Expanding Natural Gas Markets. Department of Environmental Health and Engineering, Environmental Science & Management Seminar. Johns Hopkins University.
11. **Jordaan, S. M.** (2016) Keynote Presentation on Emissions from Liquefied Natural Gas Export from Canada. Invited by Seven Generations Energy Ltd. Petroleum Club, Calgary, Alberta.
12. **Jordaan, S. M.** (2015) Keynote Speech: A Sustainable Energy Future. Energy Bowl, University of Calgary, March 7, 2015.
13. **Jordaan, S. M.** (2015) Panel on Hydraulic Fracturing. Canadian Political Science Student's Association (CPSSA) National Conference on Energy and Environmental Politics. January 21-24, 2015. Calgary, Alberta. Participants: Alex Ferguson, Vice-President of Policy and Environment, Canadian Association of Petroleum Producers; Peter Howard, President Emeritus, Canadian Energy Research Institute.
14. **Jordaan, S. M.** (2015) Panel on Pipeline Politics. CPSSA National Conference on Energy and Environmental Politics. January 21-24, 2015. Calgary, Alberta. Participants: Laura Estep, Denton; Prof. James Coleman, Assistant Professor of Law, University of Calgary.
15. **Jordaan, S. M., I. M. Herremans, J. Nazari.** (2015) Bridging the Innovation Gap for Energy Technologies: The Canadian Context. CPSSA National Conference on Energy and Environmental Politics. Calgary, Alberta, January 21<sup>st</sup>-24<sup>th</sup>.
16. **Jordaan, S. M.** (2014) Public Policy and Canada's Resource Sector: The Role of Knowledge and Science in Democratic Decision-Making. Panel on Alternative Perspectives – Environmental Impacts of Oil Sands, 13<sup>th</sup> Aboriginal Oil & Gas Forum. November 25<sup>th</sup>-26<sup>th</sup>. Edmonton, Alberta. Participants: Soledad Mills, VP, Equitable Origin; Neil Philcox, Co-Founder and Partner, The Blended Capital Group; Dan Zilnik, President of Oil and Gas Sustainability Ltd. Moderated by Jason Switzer, the Pembina Institute.
17. **Jordaan, S. M., I. M. Herremans, J. Nazari.** (2014) Bridging the Innovation Gap for Energy Technologies: The Canadian Context. Keynote, Think Sustainability Forum, October 28, 2014. Calgary, Alberta.
18. **Jordaan, S. M.** (2014) Session Chair for New Energy Sources, Energy in the Americas: Critical Reflections on Energy & History, October 23-24, 2014. University of Calgary, Calgary, Alberta. Participants: Paul Chastko, Instructor, Department of History, University of Calgary; Jeffrey T. Manuel, Assistant Professor, Department of History, Southern Illinois University-Edwardsville; Tyler Priest, Associate Professor of History and Geography, University of Iowa.
19. **Jordaan, S. M.** (2014) Panel on Sustainable Development and the Energy Mix. World Summit on Sustainability, the Energy Mix and Fragile Environments, July 20-24<sup>th</sup>. San Cristobal, Ecuador. Panelists: Byron Chiliquinga-Mazon, OLADE; Horacio Cuevas, Inter-American Development Bank (IDB); Adriana Valencia, IDB. Moderated by Michael Quinn, Mount Royal University.

20. **Jordaan, S. M.** (2014) PES Energy Talks: Panel on Alberta Oil Sands. University of Calgary, Petroleum and Energy Society, March 19<sup>th</sup>. Panelists: Rhona DelFrari Director of Media Relations and Issue Management at Cenovus; Kali Taylor, Executive Director at Student Energy; Chris Hunt, Director of Planning and Public Engagement, Diversification Strategy at Department of Energy, Government of Alberta. Moderated by Patrick Beatty, Government Relations at Suncor.
21. **Jordaan, S. M.** (2014) The Water-Energy Nexus: Acquiring Unconventional Fossil Fuels. Big Rock Lecture Series (proceeds for undergraduate scholarships), Calgary, Alberta, March 12<sup>th</sup>.
22. **Jordaan, S. M.** (2014) Water energy nexus in the United States: current research and emerging questions. ISEEE Energy and Environmental Systems (EES) Specialization Seminar series, University of Calgary.
23. **Jordaan, S. M.** and K. Konschnik. (2013) Current Practices and future projections, unconventional gas in the United States. Workshop to Develop Recommendations for Environmental Monitoring related to Unconventional Oil and Gas, Washington DC, December 12<sup>th</sup>-13<sup>th</sup>. Natural Resource Defense Council and the Harvard Center for Health and the Global Environment.
24. **Jordaan, S.M.**, L. D. Anadon, E. Mielke, D. P. Schrag. (2013) Regional water implications of reducing oil imports in the United States. Canadian Renewable Fuels Summit. Montreal, QC, December 2<sup>nd</sup>-4<sup>th</sup>.
25. **Jordaan, S. M.** (2012) Water-energy nexus for the future of transportation fuels. Resources for the Future Workshop on Water Resource Challenges of Unconventional Fossil Fuels.
26. **Jordaan, S. M.** (2012) Panel on Produced Water Management of Shale Gas production. Bloomberg Water Leadership Workshop, October 24<sup>th</sup>-25<sup>th</sup>. Panelists: Amanda Brock, CEO of Water Standard; and Jim Matheson, CEO of Flagship Ventures. Moderated by Frank O'Sullivan, MIT Energy Initiative.
27. **Jordaan, S. M.** (2012) The use of shale gas by the electric sector. Virginia Governor's Conference on Energy, Richmond Virginia. October 2<sup>nd</sup>- 4<sup>th</sup>.
28. **Jordaan, S. M.** (2011) Quantifying Land Use Impacts of Energy Extraction. ETIP/Energy Policy Consortium Seminar Series, Harvard University. February 28<sup>th</sup>.
29. **Jordaan, S. M.** (2011) Governance of impacts to land and water resources from oil sands development in Alberta. Workshop on the Governance of the Water-Energy Nexus. Laboratory on International Law and Regulation, University of California, San Diego.
30. **Jordaan, S. M.** and D. W. Keith (2009) Alberta's energy sources: land disturbance and fragmentation. Workshop on Land Use and Geospatial Aspects of LCA for Renewable Energy, sponsored by the National Science Foundation, Boston, MA.
31. **Jordaan, S. M.** and D. W. Keith (2008) Life-cycle eco-impacts of oil sands extraction in Alberta. Invited seminar, U.C. Davis Institute for Transportation Studies, CA.

### **Peer review**

Nature Climate Change, Nature Energy, Renewable and Sustainable Energy Reviews, Land Degradation and Development, Environmental Science and Technology, Journal of Cleaner Production, Biofuels, Bioproducts & Biorefining, Environmental Research Letters, Science Magazine, and the Journal of Environmental Management. Abstract reviewer for the American Center of Life Cycle Assessment's LCA XI conference.

### **Teaching**

*Johns Hopkins University (on leave from fall of 2016 through spring 2018)*

- Science, Technology, and International Affairs (2019).
- North American Climate Policy in a Warming World (2018).
- Life Cycle Assessment (2018, 2019).
- Comparative U.S. and Canadian Energy Policy (2016).

*University of Calgary*

- Introduction to Public Policy Analysis (2015, 2016).
- Environmental Policy Analysis (2015, 2016).
- U.S. and Canadian Energy Policy (2015).
- Energy Politics in Alberta (2013, 2014).
- Introduction to Government & Politics (2013, 2014, 2015).

*Mentorship and teaching training*

- "Best Practices in University Teaching Workshop," Center for Educational Resources, Johns Hopkins

University, January 2018. Associate Dean & Director Michael Reese, Center for Educational Resources, Johns Hopkins University.

- “Top tips to build student teams that excel” webinar, Taylor Teaching and Learning Center, University of Calgary, January 2018.
- “Preparing students for the unknown” webinar, Taylor Teaching and Learning Center, University of Calgary, January 2018.
- Student assessment and co-teaching workshops, Taylor Teaching and Learning Center, University of Calgary, 2014-2015
- One-on-one teaching mentorship with Dr. Carol Berenson at the Taylor Teaching and Learning Center, University of Calgary, 2014-2015.

#### *Teaching fellowships and assistantships*

- Teaching Fellow, Energy Consequences. Center for the Environment, Harvard University, 2010.
- Teaching Assistant, Life Cycle Assessment: Tools, Methods and Applications. Faculty of Environmental Design and the Department of Chemical Engineering, University of Calgary, 2007.
- Teaching Assistant, Conceptual Bases of Environmental Design, Faculty of Environmental Design, University of Calgary, 2005 and 2006.
- Teaching Assistant, Electromagnetic Fields I, Department of Physics, Memorial University of Newfoundland, 2002.
- Tutor, Math Help Center, Department of Mathematics, Memorial University of Newfoundland, 2000-2002.

#### **Supervision and mentorship**

##### *Past thesis-based graduate students*

Audrey Cheung. A comparative study of wind energy policy between Canada and the United States. Department of Political Science, University of Calgary. Primary supervisor with co-supervisor Dr. Ted Morton, 2017.

##### *Past project-based graduate students*

Joeti Lall. A review of the proposed Carbon Competitiveness Regulation: A Cost Effective Approach to reducing Oil Sands Emissions. M.Sc. student, Sustainable Energy Development Program, University of Calgary, 2016.

Jillian Haneiph. Methane Emissions Regulations in Western Canadian LNG: Realizing Opportunities for Success. M.Sc. student, Sustainable Energy Development Program, University of Calgary, 2016.

Rebecca Vinova. Adjustments to Alberta’s SGER to Ensure the Polluter Pays. M.Sc. student, Sustainable Energy Development Program, University of Calgary. Co-supervised with Dr. Irene Herremans, 2017.

Daryl Strom. Methane Emissions from Marcellus Shale Gas Wells. M. Eng. Energy Systems Engineering (ESE), Lehigh University. Co-supervised with Dr. Andrew Coleman, 2013.

Yida Xin. Traditional Estimated Ultimate Recovery Method Feasibility and Probable Error for Shale Gas Reservoirs. M. Eng. ESE, Lehigh University. Co-supervised with Dr. Andrew Coleman, 2013.

##### *Pre- and Postdoctoral Scholars*

Sakineh Tavakkoli (Ph.D. Environmental and Civil Engineering), Postdoctoral Fellow, Johns Hopkins SAIS 2018-present.

Adrienne Davidson, (pre-doctoral Fulbright Canada Scholar, Political Science), Johns Hopkins SAIS 2016-2017.

Adebola Kasumu (Ph.D. Chemical Engineering), Postdoctoral Fellow, University of Calgary 2014-2016.

Ehsan Mohammadi (Associate, Ph.D. Candidate in Geomatics Engineering), University of Calgary 2014-2015.

##### *Summer Research Fellows*

Jiyun Park (Research Assistant), Johns Hopkins SAIS 2018.

##### *Research Assistants*

JinGe Yu (Research Assistant), Johns Hopkins SAIS 2019 - present.

Aditya Bhalchandra (Research Assistant), Johns Hopkins SAIS 2018 - present.

Lisa Jenkins (Research Assistant), Johns Hopkins SAIS 2017 - present.

Jiyun Park (Research Assistant), Johns Hopkins SAIS 2017 - present.

Wenye Sun (Research Assistant), Johns Hopkins SAIS 2017 - 2018.

Viviana Specioso (Research Assistant), Johns Hopkins SAIS 2017 - 2018.

Yixuan Zhu (Research Assistant), Johns Hopkins SAIS 2017.

Luke Reidy (Research Assistant, Political Science), University of Calgary 2014.  
Jack Middleton (Undergraduate Research Assistant, Political Science), University of Calgary 2014.  
Amy Glassman (Undergraduate Research Assistant, Political Science), University of Calgary 2015.

#### *Student Assistants*

Lindsey Breier, (Online Curriculum Assistant), Johns Hopkins SAIS 2018 - present.  
Akanksha Goyal, (Online Curriculum Assistant), Johns Hopkins SAIS 2018 - present.

#### *Ph.D. examination committees*

Anne-Marie Livingstone, Department of Sociology (Doctoral defense), Johns Hopkins University, 09/2018.  
Maha Al'Zubi, Environmental Design, specialization in Energy and Environmental Systems (Doctoral defense), University of Calgary, 12/2016.  
Andrew Butt, Interdisciplinary Studies (Doctoral defense), University of Calgary, 04/2014.  
Maha Al'Zubi, Environmental Design, specialization in Energy and Environmental Systems (Candidacy exam), University of Calgary, 03/2014.  
Alison Aminto, Environmental Engineering (Candidacy exam), Drexel University, 04/2012.

#### *Additional mentorship and supervision*

C. Rose Kennedy (Harvard Graduate Women in Science and Engineering (HGWISE)), 2011.  
Hannah Lee (HGWISE), 2010-2011.  
Jennifer McKee (undergraduate research assistant, Harvard University), 2011.

### **Project management**

*Calibrating Liquefied Natural Gas Export Life Cycle Assessment: Accounting for Legal Boundaries & Post-Export Markets*, MIT, University of Calgary (2014-2016)

Faculty: Dr. James Coleman (Co-P.I.), Dr. Sarah Jordaan (Co-P.I.)  
Postdoctoral Fellow (Chemical Engineering): Dr. Adebola Kasumu  
Graduate students: Jeanne Liendo (UCalgary), Vivian Li (MIT)

*The Spatial Footprint of Natural Gas Fired Electricity (Texas)*, University of Calgary, NREL, EPRI (2013-2016)

NREL lead: Dr. Garvin Heath  
EPRI program/project managers: Dr. Sean Bushart, Dr. Steven Rose  
Faculty: Dr. Sarah Jordaan (P.I.), Dr. Danielle Marceau  
Graduate student (Geomatics Engineering): Ehsan Mohammadi  
Project Engineer: Vivian Li (EPRI)

*Energy Technology Innovation in Canada*, University of Calgary, Simon Fraser University (2014-2016)

Faculty: Dr. Sarah Jordaan, Dr. Irene Herremans, Dr. Jamal Nazari  
Graduate students (SEDEV): Elizabeth Romo, Siamak Khorrami, Romaine McLeary  
Undergraduate (Political Science, Business): Luke Reidy, Jack Middleton, Shivani Sachdev, Amy Glassman

*Renewable Portfolio Standards: Life Cycle Land Use and Project Economics of Wind and Anaerobic Digestion in the Great Plains*, Drexel University, University of Calgary (2014-2015)

Faculty: Dr. Sabrina Spatari, Dr. Sarah Jordaan, Dr. Stephen V. Smith  
Graduate student (Civil Engineering): Carlo Ciliberti

*EPRI Research Project: Shale Gas in the U.S. (2012-2013)*

Program/Marketing Managers: Dr. Sean Bushart, Dr. Andrew Coleman  
Project lead: Dr. Sarah Jordaan  
Technical managers: Dr. Stephanie Shaw, Dr. Bob Goldstein, Dr. Vic Niemeyer  
Technical assistants: Vivian Li, C.J. Veatch  
Graduate Students: Daryl Strom, Yida Xin

*EPRI Research Project: Produced Water Technologies (2012-2013)*

Program Manager: Dr. Sean Bushart  
Project lead: Dr. Sarah Jordaan  
Research commissioned to Carnegie Mellon University and University of Texas, Austin



### Academic and university service

- Initiated, organized, and moderated the first 2019 SAIS-ERE Global Leader's Forum on Science, Technology and International Affairs, entitled "From Dominance to Diplomacy: the U.S. approach to advances in science and technology" featuring Andrew Hebbeler, Ph.D. (Deputy Director, Office of Science and Technology, Department of State), Jaime C. Adams (Senior Advisor for International Affairs, Office of the Chief Scientist, Office of the Secretary, U.S. Department of Agriculture) and Jeremy Muldavin, Ph.D. (Deputy Director of Defense Software & Microelectronics Activities, Office of the Undersecretary of Defense for Research and Engineering).
- Invited Seminar, Life cycle assessment: informing decisions about energy technologies. Johns Hopkins Center for Global NCD Research and Training, Johns Hopkins University, December 7<sup>th</sup>, 2018.
- Invited Seminar, Life Cycle Assessment as a tool for understanding the water implications of energy decisions. Randolph Bromery Lecture Series, Department of Earth and Planetary Sciences, Johns Hopkins University, October 25<sup>th</sup>, 2018.
- Speaker for JHU Carey School Workshop entitled "Networking without Borders" with Dr. Nayoung Louie. Workshop organized by graduate students in Carey School's Women in Business.
- Member of Bloomberg Distinguished Professor Committee, 2018.
- Member, SAIS-ERE full-time faculty committee, 2018. Researched and advised the committee on curriculum development, including drafting learning outcomes for ERE program.
- Overseeing the development of "Online Basics of Environment" for the SAIS-ERE program through hiring and working with two student assistants.
- Initiated, organized, and moderated the 2018 SAIS-ERE Climate Policy and Clean Energy Special Lecture Series featuring: Dr. Rachel McCormick (Energy and Environmental Program, Embassy of Canada), Alice Hill (Former Advisor to President Obama and Hoover Fellow, Stanford University), Hector Castro Vizcarra (Minister for Energy Affairs, Embassy of Mexico to the United States), Fall Semester 2018.
- Organized and moderated SAIS-ERE special lecture on careers in energy by Mr. Barry Worthington, Executive Director of the United States Energy Association, October 22, 2018.
- Invited seminar. Life Cycle Assessment as a Tool for Understanding the Water Implications of Energy Decisions. Randolph Bromery Lecture Series, Department of Earth and Planetary Sciences, Johns Hopkins University, October 25<sup>th</sup>, 2018.
- Opening remarks for the Asian Americans in Energy, Environment and Commerce co-hosted event with the SAIS Energy and Environment Club entitled "Energizing the Future – Looking at the Global Nuclear Energy Industry," September 25<sup>th</sup>, 2018.
- Invited seminar. The Life Cycle Land Footprint of Energy Infrastructure. Initiative for Sustainable Energy Policy research seminar series, Johns Hopkins University, April 26, 2018.
- Invited seminar. Global natural gas: market evolution and climate implications. EPC-ESP Forum, Advanced Academic Programs, Johns Hopkins University, March 8, 2018.
- Guest Lecture for Energy Systems Analysis (course led by Professor Dennice Gayme) entitled "Life cycle assessment: introduction and application to energy technologies," Whiting School of Engineering, Johns Hopkins University, March 27, 2018.
- Participant, Faculty Mentoring Lunch Workshop, Johns Hopkins University, SAIS, 2017.
- SAIS-ERE representative, Energy Work Group, Whiting School of Engineering, Johns Hopkins University, 2017 - present.
- Member, PhD committee (non-participant, on leave), Johns Hopkins University, SAIS, 2017.
- Invited seminar. Department of Environmental Health and Engineering, Environmental Science & Management Seminar. Johns Hopkins University, November 15, 2016
- Student project supervisor, graduate program in Sustainable Energy Development, Haskayne School of Business, University of Calgary (2015 - 2017).
- Member, Faculty Search Committee for Tenure-Track Assistant Professor, Electrical and Computer Engineering, Schulich School of Engineering, University of Calgary (2016).
- Adjudicator, Undergraduate Research Symposium, University of Calgary (2014, 2015).
- Faculty advisor, Canadian Political Science Student Association's National Conference on Energy and Environment (2014-2015).
- Adjudicator, Poster Competition, Fracturing Impacts and Technologies Conference, Texas Tech University and the Air and Waste Management Association (2014).

- Participation in various departmental committees (e.g. undergraduate), Department of Political Science, University of Calgary (2013-2015).
- Research Ethics Committee, Faculty of Environmental Design, University of Calgary (2006-2007).
- Campus Environment Representative, Environmental Design Student Association (2006-2007).
- Co-founder, Mercury upRISING. Student initiative to raise awareness about climate change on campus, funding from the Government of Alberta (2006-2009).
- Vice-President, Environmental Design Student Association (2005-2006).

#### **External service (selected)**

- Session co-Convener with Dr. Scot Miller (Whiting School of Engineering), “Emissions of Atmospheric Pollutants from Oil, Gas, and Coal Operations,” American Geophysical Union, Fall 2018 meeting.
- Adjudicator for student presentations, Ecological Society of America, 2018 Annual meeting.
- Board Member (Events Committee), Women in Energy DC (2018).
- Education Committee, American Center for Life Cycle Assessment (2018).
- Policy Committee, American Center for Life Cycle Assessment (2017).
- Technical Committee, Equitable Origin (2015 - present).
- Reviewer, Shale Gas Standards, Equitable Origin (2015).
- Country Analyst for PRIX index on Political Risk and Oil Exports (2015).
- Board Member, Young Environmental Professionals (YEP), Calgary Chapter (2005-2010).
- Environmental Advisory Committee, City of Calgary (2008).
- Science Writer, Protect Our Winters (2007).
- Participant, Shell Canada Sustainability Report Review Panel (2006-2007). Honorarium received.
- Cancer Society, Newfoundland (2000).

#### **Workshop participant**

- Contributor, U.S.-Canada Shared Priorities for a Sustainable Future Working Summit, Meridian International Center, May 24, 2018, Washington, DC.
- Expert Stakeholder Workshop: Wholesale Electricity Markets at a Crossroads? Examining PJM Market Designs from the Perspective of the States. Organized by the Great Plains Institute & Nicholas Institute for Environmental Policy Solutions, September 29, 2017, Columbus OH.
- Expert Workshop on the Future of Power Markets in a Low Marginal Cost World. Organized by Resources for the Future and the National Renewable Energy Laboratory. September 14, 2017, Washington, DC.

#### **Outside professional activity**

- Carbon Management Canada. Policy proposal review, greenhouse gas emissions reduction strategy for the Government of Alberta (2015).
- British Petroleum. Project on produced water technologies and the water energy nexus in the U.S. (2013).
- EPRI. Shale gas project transition and completion (2013).
- Shell Canada. Spatial models of Elk (*Cervus elaphus*) in Southwest Alberta. Project completed for a graduate course in Geography at the University of Calgary (2005).

#### **Media (in progress)**

2018 Energy, Climate Policy.

- Business in Vancouver: “Canada implements methane reduction regulations”  
<https://biv.com/article/2018/04/canada-implements-methane-reduction-regulations>

2018 Climate Policy

- ScienceDaily, “Methane emissions reduction from oil and gas in North America examined”  
<https://www.sciencedaily.com/releases/2018/02/180212084357.htm>
- Washington Examiner, “Methane gets fresh look as Trump scraps rules”  
<http://www.washingtonexaminer.com/methane-gets-a-fresh-look-as-trump-scraps-rules/article/2648781>

2018 Environmental Science & Technology

- S&P Global Markets: “US, Canadian LNG benefits climate if it replaces coal, study finds”  
<https://platform.mi.spglobal.com/web/client?auth=inherit#news/article?id=43293892&ccid=A-43293892-11562>
- Business in Vancouver: “Gas could help put brakes on climate change, study finds”

<https://biv.com/article/2018/02/gas-could-help-put-brakes-climate-change-study-finds>

2017 Nature Energy article

- E&E news: “Studies attack conventional wisdom on natural gas” <https://www.eenews.net/stories/1060062933>
- ScienceDaily, “New method to quantify life cycle land use of natural gas” <https://www.sciencedaily.com/releases/2017/10/171003111059.htm>

2016 C.D. Howe e-Brief

- Business News, CTV television news network (Canadian National News); Op-Ed, Globe and Mail Newspaper; Business in Vancouver’s radio show; CBC news (2016).

Numerous subject-matter expert interviews (unrelated to specific publications)

- Gauntlet, University of Calgary student newspaper (2015).

2014 Science publication

- Interviewee, Calgary Herald, Vancouver Sun (2014).

Subject matter expert on climate change and oil sands development

- Interviewee, Much Music Talks: Climate Change (2008).

### **Other outreach (in progress)**

- Webinar presenter to Pakistan, hosted by: Women Engineers, Pakistan; Women in Energy, Pakistan; and, SAIS Women Lead (2019). “Global natural gas: market evolution and life cycle greenhouse gas emissions implications for the power sector,” Wednesday, January 30<sup>th</sup>. Women Engineers, Pakistan reports: 3,100 people watched the webinar, and 1430 actively engaged with the content.
- Webinar organizer, host, and speaker, Expert Review Webinar entitled “Improving Spatiotemporal Energy Infrastructure Datasets for the United States.” Project funded by Alfred P. Sloan Foundation.
- Webinar co-presenter with Dr. Garvin Heath (2018) “Land Use Requirements and Impacts of Electricity Generation from Natural Gas and Renewables,” Environmental Aspects of Renewables Forum, Electric Power Research Institute, May 31.
- Webinar panelist, Gastalk Webinar March: Special focus on Canada (2018), March 27. <http://www.gastechevent.com/node/6350>
- Webinar presenter, Joint Institute for Strategic Energy Analysis (JISEA) (2016).
- Webinar organizer and presenter, Clean Energy Innovation in Canada, Haskayne School of Business, University of Calgary (2015).
- Webinar presenter, Natural Resources Defense Council and Harvard Center for Health and the Global Environment (2014).
- Volunteer outreach assistant, Canadian Parks and Wilderness Society, Calgary (2005-2006).
- Volunteer outreach and field assistant, Balkan Wildlife Society, Bulgaria (2004).

### **Memberships**

- American Center for Life Cycle Assessment, 2008-2012, 2014 - present.
- American Geophysical Union, 2014-2015, 2018 - present.
- Ecological Society of America, 2018.
- Association for Public Policy Analysis and Management, 2017 - present.
- Harvard Club of DC, 2017- present.
- Women in Energy DC, 2017 - present.
- Canadian Sustainability Indicators Network, 2007-2010.

### **Executive training (voluntary)**

- Technology Entrepreneurship, Executive Education Seminar, Carey Business School, Johns Hopkins University, July 2018.
- Women in Leadership: Approach and Impact, Short Course in Executive Education, Carey Business School, Johns Hopkins University, January 2018.
- Strategic Conflict Management, Executive Education Seminar, Carey Business School, Johns Hopkins University, 2017.
- Women in Energy DC, Executive Training Workshop, 2017.

### **Communications training (voluntary)**

- Communicating with Tact and Skill, Johns Hopkins University, 2017.
- Relationship Awareness Theory: The Key to Better Communication and More Productive Conflict, Johns Hopkins University, 2017.

### **Diversity training (required for all faculty, staff, and students)**

- Title IX and Harassment Prevention, Office of Institutional Equity, Johns Hopkins University, 2017.

### **Extra-curricular memberships and certifications**

- US Sailing Small Boat certification, DC Sail, 2017.
- Member of DC Sail, 2017-present.
- Avalanche Awareness Certification, Outdoors Center, University of Calgary, 2009.
- Previous extracurricular activities include: soccer, snowboarding, art.

### **Computer skills**

ArcGIS, MATLAB, Mathematica.

### **Languages**

English and French.