Sean Smillie, P.Eng., Ph.D.

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. Vancouver, BC
Managing Consultant

Dr. Sean Smillie focuses on developing efficient and technically sound energy policy at the intersection of the natural gas and electric systems. He supports E3's future of gas projects by assessing the opportunities and challenges associated with low carbon gases and building electrification. He also draws on his professional background and academic research in assessing gas and electric interdependencies on the bulk system and their reliability implications.

CARNEGIE MELLON ELECTRICITY INDUSTRY CENTER Pittsburgh, PA
PhD Researcher 2019 – 2023

- Evaluated the cost-effectiveness of hybrid fossil fuel and heat pump residential heating systems to decarbonize building heat using an energy systems model. Assessed the implications to both the electric and natural gas systems
- Identified the 10% of US natural gas transmission compressor stations dependent on the electric grid. Demonstrated how this interdependency produces single-cause failures greater than any considered in electric reliability planning. Published in *The Electricity Journal*
- Analyzed the change in greenhouse gas estimates of liquefied natural gas export projects due to indirect economic effects, finding an 80% difference from prior methods. Published in *Environmental Science & Technology*
- Presented results to senior regulators and industry stakeholders at the National Association of Regulatory Utility Commissioners (NARUC) Annual Conference, the North American Electric Reliability Corporation (NERC) Gas-Electric Working Group, and the Carnegie Mellon Electricity Industry Center Annual Meeting

UNIVERSITY OF BRITISH COLUMBIA Vancouver, BC
MSc Researcher 2017 – 2019

- Quantified the technical and economic potential for low-carbon electricity generation from Canadian natural gas compressor station waste heat
- Offered follow-up contract work by three waste heat development companies

BC HYDRO Vancouver, BC
Sustainability Scholar Summer 2018

- Evaluated reliability impacts and electricity savings of high heat pump penetration on a small electric grid for the provincial electric utility, leading to revised energy efficiency program strategies

TRANSCANADA PIPELINES Calgary, AB
Mechanical Engineer January 2015 – January 2017

- Responsible for mechanical design of facility projects, including engineering and construction contractor oversight and preparing engineering documents for regulatory review.
- Implemented new research findings on high gas velocities while collaborating with stakeholders from five departments, resulting in $15 million of avoided facility costs.

Project Engineer September 2012 – January 2015

- Led pipeline construction projects with budgets up to $80 million from preliminary stages to successful completion, including managing contractors, leading 15+ person weekly team meetings, and submitting project applications for regulatory review.
- Reformed construction scheduling and contractor manpower tracking systems for regulated Canadian pipeline projects ($200-$500 million annually), vastly improving internal data-driven evaluations of multimillion-dollar contract claims.

Education

Carnegie Mellon University Pittsburgh, PA
Ph.D., Engineering and Public Policy August 2023
Fulbright Scholarship 2019 – 2022

University of British Columbia Vancouver, BC
M.Sc., Resources, Environment and Sustainability June 2019

University of Alberta Edmonton, AB
B.Sc., Mechanical Engineering April 2012

Publications

Smillie, S., Muller, N., Griffin, W. M., & Apt, J. (2022). Greenhouse Gas Estimates of LNG Exports Must Include Global Market Effects. *Environmental Science & Technology*, *56*(2), 1194–1201. https://doi.org/10.1021/acs.est.1c04753

Smillie, S., Morgan, M. G., & Apt, J. (2023). How vulnerable are US natural gas pipelines to electric outages? *The Electricity Journal*, *36*(2), 107251. https://doi.org/10.1016/j.tej.2023.107251