Seminar Title: Models to advance renewable energy deployment

Abstract
Results from integrated assessment models of the global climate and energy system suggest that over 50% of the emission reductions needed to stabilize average temperatures at 2 degrees Celsius will come from the deep decarbonization of the electric power sector. This requires drastically increasing the amount of electricity produced from renewable generators like wind and hydropower plants. These sources, however, are variable and intermittent, and cannot be entirely relied upon to provide electric power when it is needed. This talk will focus on novel methods to advance the integration of renewable generation into the power system. The first is a spatio-temporal model that improves forecasts of system-wide wind power. The second is an integrated hydrokinetic power prediction and energy system planning model, employed at a greenfield site in rural Alaska. Ongoing research efforts from these two methods will also be discussed.

Bio
Dr. Schell's research develops mathematical models that inform the energy transition.
She works at both the generation level, improving wind energy resource assessment and forecasting, and at the systems level, designing adaptable microgrids that can respond to future climate events. Methodologically, she has contributed to advancing spatio-temporal statistical forecast models, deep learning architectures and energy system network optimization. These models are informed by large, empirical data from wind power producers, electric utilities, independent system operators and numerical weather prediction models. Dr. Schell is an Assistant Professor in Mechanical and Aerospace Engineering at Carleton University, where she serves as a core faculty member for the undergraduate program in Sustainable and Renewable Energy Engineering (SREE). Prior to joining Carleton, Dr. Schell was an Assistant Professor in Industrial and Systems Engineering at Rensselaer Polytechnic Institute (RPI) in Troy, NY, where she was part of a team awarded a US Department of Energy (DOE) ARPA-E grant. Dr. Schell held two postdoctoral positions, including as an IVADO Post-doctoral Fellow at Polytechnique Montreal. She holds a BS in Chemical Engineering from Carnegie Mellon University, an MS in Environmental Engineering from Johns Hopkins University, and dual Engineering PhDs from Carnegie Mellon University and the Faculty of Engineering at the University of Porto, Portugal.