ABSTRACT: With increasingly volatile oil prices, unprecedented US dependence on imported petroleum, and growing environmental concerns, the creation of economically sustainable markets for alternative fuel vehicles (AFVs) is vital. However most efforts to transition away from an internal combustion engine dominated transportation system have failed or had limited success. The diffusion of AFVs is complex, being both enabled and constrained by powerful positive feedback arising from various scale and scope economies and experience curves involving the automotive and fuel supply chain, and consumer behavior. To develop an in-depth understanding of the major challenges and to identify high-leverage strategies in transitioning away from a fossil fuel and carbon based private transportation system we have developed a suite of behavioral dynamic, spatially disaggregated models with a broad scope. In the models autonomous decision makers include consumers, automotive OEMs, infrastructure providers, and policy-makers. In this paper we discuss several simulation-based thought experiments designed to examine the existence and character of tipping points in self-sustaining AFV adoption, and factors affecting the rate of adoption under a variety of scenarios. In particular, we identify and explore an ambivalent effect of higher oil prices on the rate of plug-in electric vehicle adoption. The talk concludes with a discussion of work-in-progress empirical analysis of historic hybrid electric vehicle adoption in the United States. This is joint-work with John Sterman (MIT).

BIO: Jeroen Struben is an Assistant Professor in the Strategy & Organization Area at the Desautels Faculty of Management, McGill University. Jeroen is also a Research Affiliate at the MIT Sloan School of management where he co-leads a project on transitions to alternative energy in transportation. Jeroen examines processes of industry transformation combining firm- and socio-technical trajectory-levels of analysis. He is particularly interested in the role of coordination and commitment across organizations and industries. In analysis Jeroen draws upon empirical cases (successful and failed introductions) and dynamic modeling.