



In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

Wes Herche

Will defend his prospectus

Policy, Technological Feasibility, and Market Factors that Affect the Adoption of Solar Renewable Energy Generation

Abstract

Solar photovoltaic (PV) energy production is a small but rapidly growing segment of the global energy generation mix. Solar PV energy has several properties that make it a unique and interesting player in energy. From the tiny PV strip that powers a pocket calculator to the massive solar PV power plants with a generating capacity measuring in the hundreds of megawatts, solar is universally scalable. Of the various renewables in the marketplace solar PV is also the most easily scaled and distributed to the individual residence or commercial building to deliver power directly to the point of consumption without the need for a transmission or distribution network. And yet utility-scale solar arrays can readily make use of the existing grid infrastructure making it a highly agile generation technology.

The goal of my research is to examine policy, technological feasibility through geospatial analysis, and market factors, in their relationship to solar natural capital, that have driven solar PV adoption and anticipate what mix of these three factors might drive greater adoption into the future. These factors are not examined in isolation but rather in their interaction with each other, their contextual framing, their potential relationship to solar natural capital, and with regards to the core dimensions in what the World Energy Council dubs the “energy trilemma” of security, equity (affordability), and sustainability. At a tactical or near-term level of analysis the needs of energy security and energy sustainability can be somewhat differentiated, but at a strategic or long-term level of analysis energy generation from a finite resource (fossil fuels) is inherently insecure; this research is primarily concerned with the strategic level of analysis where energy security and energy sustainability become indistinguishable.

Thursday, January, 19, 2017
3:30 – 5:00 p.m.
Wrigley Hall, Room 401

Faculty, students, and the general public are invited.

Supervisory Committee:
Dr. Rob Melnick (Chair)
Dean Christopher Boone
Dr. Mike Pasqualetti