**MATTHIAS FRIPP**

University of Hawaii, Department of Electrical Engineering, Honolulu, HI 96822

**(a) Professional Preparation**

Lewis & Clark College, Environmental Studies (Summa Cum Laude), B.A., 1999

University of California, Berkeley, Energy and Resources, M.S., 2003

University of California, Berkeley, Energy and Resources, Ph.D., 2008

**(b) Appointments**

Assistant Professor of Electrical Engineering, University of Hawaii at Manoa, 2012–present

Research Fellow in Renewable Energy, University of Oxford (UK), 2008–2012

Consultant, Union of Concerned Scientists, Berkeley, California, 2008–2009

Graduate Student Instructor (teaching assistant), University of California, Berkeley, 2007

Research Assistant, Energy, Markets and Policy, Lawrence Berkeley National Laboratory, 2003–2006

Information Systems Consultant (volunteer), Sarvodaya Shramadana Movement, Sri Lanka, 2005

Chief Modeler, Trexler and Associates, Inc., Portland, Ore., 2000–2001

Researcher and Writer (volunteer), 1000 Friends of Oregon, Portland, Ore., 1999

Summer Researcher, Renewable Northwest Project, Portland, Ore., 1999

Membership Director, Information Systems Manager, Best Friends Animal Sanctuary, 1991–1997

**(c) Products**

*Products most closely related*

Justin Carland, Monica Umeda, Trevor Wilkey, Adam Oberbeck, Jimmy Cumming, Nathan Parks, Matthias Fripp, Anthony Kuh, David Garmire "Self-Sustaining Meteorological Wireless Sensor Networks,**"** Sensors and Transducers Journal, Vol. 160, Issue 12, December 2013, pp. 118-124.

Matthias Fripp (2011), “Greenhouse Gas Emissions from Operating Reserves Used to Backup Large-Scale Wind Power,” *Environmental Science & Technology* 45(21): 9405-9412.

Matthias Fripp (2012), “Switch: A Planning Tool for Power Systems with Large Shares of Intermittent Renewable Energy” *Environmental Science & Technology* 46(11): 6371–6378.

James Nelson, Josiah Johnston, Ana Mileva, Matthias Fripp, Ian Hoffman, Autumn Petros-Good Christian Blanco and Daniel Kammen (2012), “High-resolution modeling of the western North American power system demonstrates low-cost and low-carbon futures,” *Energy Policy* (43) 436–447.

Matthias Fripp (2008), *Optimal Investment in Wind and Solar Power in California,* Ph.D. Dissertation, U.C. Berkeley, Energy & Resources Group.

*Other selected products*

Matthias Fripp and Ryan H. Wiser (2008), “Effects of Temporal Wind Patterns on the Value of Wind-Generated Electricity at Sites in California and the Northwest,” IEEE Transactions on Power Systems 23(2): 477-485.

Matthias Fripp (2009), “Life-Cycle Greenhouse Gas Emissions From Clean Coal, Clean Gas and Wind Generators,” Environmental Change Institute, Oxford University.

Brian Krohn and Matthias Fripp (2012), “A Life Cycle Assessment of Biodiesel Derived from the ‘Niche Filling’ Energy Crop Camelina in the USA,” *Applied Energy* 92: 92–98.

Asher Ghertner and Matthias Fripp (2007), “Trading Away Damage: Quantifying Environmental Leakage through Consumption-Based, Life-Cycle Analysis,” *Ecological Economics* 63: 2-3: 563-577.

Diana Poputoaia and Matthias Fripp (2008), *European Experience with Tradable Green Certificates and Feed-In Tariffs for Renewable Electricity Support,* Environmental Change Institute, Oxford University.

**(d) Synergistic Activities**

(i) **Long-term power system planning model (Switch)**  
Developed “Switch,” the first open-source power system investment planning model to incorporate enough detail spatial and temporal detail to optimize deployment of renewable and conventional generators and transmission capacity in large power systems. I used this model to study California’s emission-reduction options for my Ph.D. dissertation and a recent paper. Colleagues have subsequently used it to model the development of the whole western-U.S. power system.

(ii) **Intermittent Generation Operating Reserves model (IGOR)**  
Developed a new algorithm for modeling the probability distribution of forecast errors for wind farms dispersed across large areas. This is much more accurate than previous methods, and makes it possible to estimate how much fossil-powered reserve capacity must be kept online to compensate if wind power drops unexpectedly. Published a paper on IGOR and presented the model by invitation to industry professionals at the Utility Wind Integration Group’s annual technical workshop.

(iii) **Power plant life-cycle emissions meta-model**  
Developed a new “meta-model” for the life-cycle greenhouse gas emissions from electricity generating technologies. This model identifies all the steps in the electricity life-cycle (e.g., plant construction, preparation of pollution-control materials, etc.), and estimates emissions during each step using data from previously published but less-complete life-cycle studies. This provides a transparent and consistent comparison of all generation technologies and more complete emission estimates than have previously been available.

(iv) **Public domain wind speed database**  
Built a temporo-spatial database of all available public domain anemometer-based wind speed measurements in California and the Pacific Northwest, synthesizing data collected by the Department of Energy, Kenetech and the Bonneville Power Administration. Built a similar database using modeled, gridded wind speed data prepared by TrueWind, Inc. Both databases were used at Lawrence Berkeley National Laboratory to assess the effect of timing on the value of wind power and have been shared with a number of other researchers.

(v) **Interdisciplinary energy teaching**Developed new methods to teach interdisciplinary energy courses (covering engineering, economics and policy) to students at U.C. Berkeley and Oxford University with backgrounds ranging from English to Electrical Engineering.

**(e) Collaborators & Other Affiliations**

*Collaborators*: Christian Blanco (UC Berkeley), Justin Carland (UH Manoa), Makena Coffman (UH Manoa), Jimmy Cumming (UH Manoa), David Garmire (UH Manoa), Ian Hoffman (UC Berkeley), Josiah Johnston (UC Berkeley), Daniel Kammen (UC Berkeley), Anthony Kuh (UH Manoa), Brian Krohn (Univ. of Michigan), Ana Mileva (UC Berkeley), James Nelson (UC Berkeley), Adam Oberbeck (UH Manoa), Nathan Parks (UH Manoa), Autumn Petros-Good (UC Berkeley), Monica Umeda (UH Manoa), Trevor Wilkey (UH Manoa).

*Graduate and Postdoctoral Advisors:* Daniel Kammen (U.C. Berkeley), Nick Eyre (Oxford Univ.)

*Graduate Students and Postdoctoral Scholars Sponsored (3):* Deepak Chermakani (Univ. of Hawaii); Daniel Curtis (Oxford Univ.); Paritosh Das (Univ. of Hawaii); Brian Krohn (Univ. of Michigan); Dominic Hofstetter (Hudson Clean Energy Partners)