

# DAVID J. MULCAHY

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## EDUCATION

**North Carolina State University: *Raleigh, NC*** Aug. 2014- Present

- Pursuing **PhD, Electrical and Computer Engineering – Power Systems** GPA: 3.86
- Working on modeling projects for NSF grant and Duke Energy involving stochastic unit commitment and probabilistic distribution infrastructure planning with high variable generation penetration
- Developing distribution system planning criteria and associated tools for utility engineers to accommodate future integration of distributed energy resources

**University of North Carolina at Chapel Hill** Aug. 2007- May 2012

- B.S., Physics and Minor, Mathematics
- **Duke University:** Certificate in Energy and the Environment
  - Focused on the connection between markets, technology, policy, and the environment
- **Robertson Scholar**
  - Recipient of 4-year full scholarship and member of an innovative leadership and social entrepreneurship program between UNC – Chapel Hill and Duke University

## RESEARCH INTERESTS

Renewable electricity integration; Power systems modeling; Power systems planning and operation; Stochastic modeling; Techno-economic modeling; Engineering and energy economics

## EXPERIENCE

**National Renewable Energy Laboratory: *Golden, CO*** May 2012 - Present

- Developed scenarios and analyzed results of U.S.-wide techno-economic electricity capacity expansion model, Regional Energy Deployment System (ReEDS)
- Performed and contributed to analysis for internal and external clients including DOE, EPA, and Rocky Mountain Institute
- Collaborated with other members of ReEDS team to implement model and cost assumption improvements in ReEDS to better represent high penetration renewables scenarios including natural gas price forecasting; generator capital and variable costs; and curtailment, capacity value, and forecast error reserve statistical calculations
- Developed vehicle scenario module for Biomass Scenario Model (BSM) which uses system dynamics to analyze policy impacts on the production of biofuels and development of biorefineries

**National Renewable Energy Laboratory: *Golden, CO*** May - Aug. 2011

- Performed research and system dynamics modeling as member of BSM team
- Researched and wrote reports on bio-based plastics, wood pellets, and energy models included as sections of published technical report

**Hannah Solar LLC: *Atlanta, GA*** Aug. 2009 - Jan. 2011

- Managed over 10 solar and wind projects from design to commissioning at rapidly growing startup
- Successfully led team that wrote over \$1 million in USDA, state, and federal grants
- Researched new technologies, system designs, grants, and other potential business opportunities

**Rural Needs Assessment: *Nyandehun Ngovehun, Sierra Leone*** May-Jul. 2009

- Performed a participatory needs assessment as member of a team in a rural village and used grant money to implement projects, targeting short and long term community needs

## CERTIFICATIONS AND SKILLS

- Experienced with data analysis techniques and modeling in **MATLAB\Simulink, OpenDSS, PowerWorld, GAMS, R, STELLA, Excel\VBA, and Tableau**
- **Certified Solar PV Installer (2009-2012):** North American Board of Certified Energy Practitioners (NABCEP)

## PUBLICATIONS

- Department of Energy. “**Wind Vision: A New Era for Wind Power in the United States.**” (2015) Washington, D.C.: U.S. Department of Energy. <http://energy.gov/eere/wind/downloads/wind-vision-new-era-wind-power-united-states>
  - **Member of Market Data and Analysis and Scenario Modeling Taskforces** and provided significant contributions to **Chapter 3 and appendices.**
- Brown, A.; Beiter, P.; Heimiller, D.; Davidson, C.; Denholm, P.; Melius, J.; Lopez, A.; Hetteringer, D.; **Mulcahy, D.;** and Porro, G. “**Estimating Renewable Energy Economic Potential in the United States: Methodology and Initial Results**” (2015) Golden, CO: National Renewable Energy Laboratory. <http://www.nrel.gov/docs/fy15osti/64503.pdf>
- Sullivan, P.; Cole, W.; Blair, N.; Lantz, E.; Krishnan, V.; Mai, T.; **Mulcahy, D.;** and Porro, G. “**2015 Standard Scenarios Annual Report: U.S. Electric Sector Scenario Exploration**”(2015) Golden, CO: National Renewable Energy Laboratory. <http://www.nrel.gov/docs/fy15osti/64072.pdf>
- Mai, T.; **Mulcahy, D.;** Hand, M.; and Baldwin, S. “**Envisioning a Renewable Electricity Future for the United States**” *Energy*. Volume 65, 1 February 2014. <http://dx.doi.org/10.1016/j.energy.2013.11.029>.
- Newes, E.; Bush, B.; Inman, D.; Lin, Y.; Mai, T.; Martinez, A.; **Mulcahy, D.;** Short, W.; Simpkins, T.; Uriarte, C.; Peck, C. “**Biomass Resource Allocation Among Competing End Uses.**” (2012) Golden, CO: National Renewable Energy Laboratory. <http://www.nrel.gov/docs/fy12osti/54217.pdf>
- **Mulcahy, D.** and Newes, E. “**International Trade of Wood Pellets.**” (Factsheet). Energy Analysis, NREL. (2013). 6 pp.; NREL Report No. BR-6A20-56791. <http://www.nrel.gov/docs/fy13osti/56791.pdf>
- **Mulcahy, D.** and Newes, E. “**International Trade of Biofuels.**” (Factsheet). Energy Analysis, NREL (2013). 4 pp.; NREL Report No. BR-6A20-56792. <http://www.nrel.gov/docs/fy13osti/56792.pdf>

## LEADERSHIP POSITIONS

### **FREEDM Student Leadership Council**

2015 to Present

- Secretary for student leadership council of FREEDM, an NSF Engineering Research Center

### **Teach A Man To Ref**

2002-2010

- Founder and organizer of an award winning program to provide opportunities for underprivileged children to earn money by becoming licensed soccer referees

### **Roosevelt Institute**

2010-2012

- As Co-Director of Energy and Environment Center, organized UNC campus events on energy policy issues including expert panels on wind energy and electric vehicles

### **Renewable Energy Special Projects Committee UNC**

2010-2012

- Reviewed funding applications for renewable energy and energy efficiency projects at UNC and researched project impacts on energy consumption and generation