



February 5, 2015

Via Electronic Filing and FedEx

Public Utility Commission
Attn: Filing Center
3930 Fairview Industrial Drive SE
Salem, OR 97308

Re: Docket No. UM 1712: Signatory Page to Appendix B of Protective Order 14-431
of Sierra Club

Please find enclosed the original and two (2) copies of the Signatory Page to Appendix B
of Protective Order 14-431 of Sierra Club in the above-referenced docket. This document
has been e-filed with the Commission and served on parties via email.

Please let me know if you have any questions. Thank you.

Respectfully submitted,

/s/ Derek Nelson

Derek Nelson
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cc: Service List

SIGNATORY PAGE
DOCKET NO. UM 1712

III. Persons Qualified under Paragraph 3(e):

I have read the general protective order, agree to be bound by the terms of the order, and will provide the information identified in paragraph 10.

By: Signature: [Signature] Date: 2/2/15

Printed Name: Nidhi Santen

Address: 485 Massachusetts Ave #2, Cambridge, MA 02139

Employer: Synapse Energy Economics

Job Title: Principal Associate

Paragraph 10(e) information also provided.

By: Signature: _____ Date: _____

Printed Name: _____

Address: _____

Employer: _____

Job Title: _____

Paragraph 10(e) information also provided.

By: Signature: _____ Date: _____

Printed Name: _____

Address: _____

Employer: _____

Job Title: _____

Paragraph 10(e) information also provided.

By: Signature: _____ Date: _____

Printed Name: _____

Address: _____

Employer: _____

Job Title: _____

Paragraph 10(e) information also provided.

Nidhi R. Santen, Principal Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 2 | Cambridge, MA 02139 | 617 453-7064
nrsanten@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Principal Associate*, 2015 – present.

Consults on issues of energy and electricity systems modeling; climate policy analysis; and computational methods for investment planning, decision-making under uncertainty, and risk analysis.

CPS Energy, San Antonio, TX. *Environmental Analyst, Air Permits Section*, 2006 – 2008.

- Analyzed federal, state, and local air pollution and energy regulation and policy impacting the utility's environmental planning and power plant operations
- Managed and obtained regulatory air pollution and operating permits for existing (20+) and proposed coal and natural gas plants
- Prepared EPA and state regulatory reports and emissions inventories
- Served as a project advisor for the utility's sponsored Electric Power Research Institute (EPRI) programs on air pollution and climate
- Co-managed a team of research scientists studying the public health impacts of the utility's air emissions

Environmental Defense Fund, Austin, TX. *Intern, Climate and Air Program*, Summer 2005.

Examined local air pollution impacts from urban construction projects in Houston utilizing EPA's atmospheric dispersion modeling tools and emissions inventories.

City of Bloomington Planning Department, Bloomington, IN. *Intern*, 2003 – 2005.

- Updated local zoning ordinance documents to reflect new green building incentives
- Developed a community-benchmarking scheme to help the city meet its green growth goals
- Researched and briefed planning staff on new sustainable development program possibilities

Restore America's Estuaries, Arlington, VA. *Program Assistant*, 2002.

- Administered a partnership with the federal government to fund coastal restoration projects, including writing grant proposals and project progress reports
- Helped develop a new field guide to coastal habitat restoration through research and writing
- Maintained a public database of funding opportunities for coastal restoration projects

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- Developed and coordinated the organization's communications, marketing, and public outreach efforts

Alliance to Save Energy, Washington, DC. *Energy Policy Intern*, Fall 2001.

- Analyzed federal energy legislation for efficacy of industrial emissions reduction and vehicle fuel efficiency improvement
- Monitored developments at congressional hearings, briefings, and press conferences

The Nature Conservancy, Arlington, VA. *Federal Governmental Relations Intern*, Summer 2001.

- Analyzed legislative proposals for land conservation, and composed letters to member of Congress requesting increased government funding for conservation projects
- Co-organized a large Capitol Hill reception with Congressional staff to support conservation

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

PhD Engineering Systems, October 2012

Indiana University – Bloomington, Bloomington, IN

MPA Environmental Policy, May 2006

MS Environmental Science, Concentration in Atmospheric Science, May 2006

University of Illinois at Urbana-Champaign, Urbana-Champaign, IL

BA Environmental Geography, May 2001

ADDITIONAL EXPERIENCE

RESEARCH EXPERIENCE

Harvard Kennedy School, Cambridge, MA. *Project Manager, Energy Technology Innovation Policy research group*, 2014 – 2015.

- Pursued research in electricity technology investment planning and regulatory policy design, with an emphasis on emerging distributed electricity systems, smart grid development, and cyber security
- Managed a team of approximately ten doctoral students and post-doctoral research fellows examining the impact of various energy and environmental policy instruments on energy innovation and adoption in the U.S., Europe, Brazil, India, and China
- Co-organized a series of industry-sponsored workshops to explore the government's role in, and optimal policies for, commercialization of second-generation biofuels

Postdoctoral Research Fellow, 2012 – 2014

- Developed a decision tool to numerically evaluate optimal generation capacity and R&D policy portfolios for the U.S. electric power sector under path-dependent uncertainties
- Assisted HKS faculty co-PIs with research group management and development (e.g., writing grants and annual reports, preparing fellowship recruitment materials, coordinating the fellowship application review process, mentoring junior fellows, leading a study group)

National Academy of Sciences, Washington, DC. *Research Consultant, Board on Science, Technology, and Economic Policy*, 2013 – 2015.

- Provided technical expertise in the field of electricity technology innovation and policy for a U.S. Department of Energy-sponsored project examining market adoption of advanced energy efficiency and renewable energy technologies
- Assisted with background research, literature surveys, and writing on various topics related to energy technology innovation, financing, and electric utility regulatory policy reform

Massachusetts Institute of Technology, Cambridge, MA. *Research Assistant*, 2009 – 2012.

- Developed a stochastic model for global climate change policy analysis to study optimal policy decisions under extreme uncertainties and interim learning, in the context of highly dimensional solution spaces; project funded by the National Science Foundation
- Developed and helped statistically analyze a dataset of U.S. energy patents and patent citations to empirically characterize the distribution of uncertain R&D returns for several emerging technologies

Institute for Research in Technology (IIT), Comillas University, Madrid, Spain. *Visiting Student, Energy Regulation and Economics Research Group*, Summer 2011.

Performed an analysis of alternative model designs for numerically evaluating electricity generation infrastructure investment decisions for the U.S. power sector.

TEACHING AND ADVISING EXPERIENCE

Massachusetts Institute of Technology, Professional Education Short Programs
Co-Instructor, Professional Education Course, “Decision-Making, Design, and Strategy under Uncertainty,” Summer 2013.

Indiana University-Bloomington, Hutton Honors College
Academic Advisor, Undergraduate Programs in Math and Science, 2005-2006

Indiana University-Bloomington, School of Public and Environmental Affairs
Teaching Assistant, Graduate Student Math Camp, Summer 2005

PUBLICATIONS

Popp, D., Santen, N.R., Fisher-Vanden, K., and Webster, M. 2013. "Technology variation vs. R&D uncertainty: what matters most for energy patent success?" *Resource and Energy Economics* 35(4): 505-533.

Webster, M., Santen, N.R., and Parpas, P. 2011. "An approximate dynamic programming framework for modeling global climate policy under decision-dependent uncertainty." *Computational Management Science* 9: 339-362.

Santen, N.R. and Diaz Anadon, L. 2014. "Electricity technology investments under solar RD&D uncertainty: how interim learning and adaptation affect the optimal strategy." (submitted)

Santen, N.R., Webster, M.D., Popp, D., and Perez-Arriaga, I. 2014. "Inter-temporal R&D and capital investment portfolios for the electricity industry's low carbon future." (in review)

Webster, M., Fisher-Vanden, K., Popp, D., and Santen, N. 2014. "Should we give up after Solyndra? Optimal technology R&D portfolios under uncertainty." (in preparation for *Journal of Environmental Economics and Management*)

Santen, N.R., and Webster, M. 2014. "Electricity technology R&D funding under innovation uncertainties." (in preparation for *Risk Analysis*)

PRESENTATIONS

Santen, N.R. and Diaz Anadon, L. "Electricity technology investments under solar RD&D uncertainty: How interim learning and adaptation affects the optimal decision strategy." II International Academic Symposium: R&D on Energy, Chair of Energy Sustainability, University of Barcelona, Barcelona, January 2014. (Presented by Diaz Anadon)

Santen, N.R. and Diaz Anadon, L. "A stochastic model for power generation RD&D and capital investment planning under decision dependent uncertainty." 10th International Conference on Computational Management Science, Montreal, Quebec, May 2013.

Santen, N.R. "Power Sector Technology Investment Planning under Uncertainty." Harvard Consortium for Energy Policy Research Seminar Series, Cambridge, MA, April 2013.

Santen, N.R. and Webster, M.D. "An approximate dynamic program for modeling low-carbon energy research investments under uncertainty." INFORMS Annual Meeting, Charlotte, NC, November 2011.

Santen, N.R., Webster, M.D., Popp, D., and Perez-Arriaga, I. "U.S. electric power generation planning under endogenous learning-by-searching technology change." USAEE/IAEE North American Conference, Washington, DC, October 2011.

Webster, M.D. and Santen, N.R. "Methods for modeling decisions under uncertainty for integrated assessment models." US Department of Energy Climate and Earth System Modeling PI Meeting, Washington, DC, October 2011.

Santen, N.R. and Webster, M.D. "An approximate dynamic programming framework for modeling global climate policy under uncertainty." 8th International Conference on Computational Management Science, Neuchatel, Switzerland, April 2011.

Santen, N.R. "Introduction to electric power systems." MIT Professional Education Short Programs Course: Energy in the Context of Climate Policy: Strategic Challenges and Opportunities, Cambridge, MA, June 2009 and June 2010.

Santen, N.R. "Issues in climate change: climate policy and technological change." MIT Joint Program on the Science and Policy of Global Change Climate 101 Lecture Series, Cambridge, MA, January 2010.

Santen, N.R. and Wood, D. "Exploring Historical Roots and Current Methodologies of Engineering Systems." Second International Engineering Systems Symposium, Cambridge, MA, June 2009.

Santen, N.R. "Braunig lake power plant peaking project: new source review permitting for simple-cycle combustion turbines in Elmendorf, Texas." Alamo Area Council of Governments Air Improvement Resources Technical Committee Meeting, San Antonio, TX, June 2007.

Resume dated January 2015

CERTIFICATE OF SERVICE

I hereby certify that on this 5th day of February, 2015, I caused to be served the foregoing SIGNATORY PAGE TO APPENDIX B OF PROTECTIVE ORDER 14-431 OF SIERRA CLUB upon all party representatives on the official service list for this proceeding via electronic mail.

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Dated this 5th day of February, 2015 at San Francisco, CA.

/s/ Derek Nelson

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