



January 27, 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 Pages to Appendix B of Protective Order 14-431
of Sierra Club

Please find enclosed the original and two (2) copies of the Signatory Pages 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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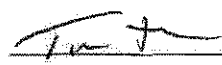
cc: Service List

SIGNATORY PAGE
DOCKET NO. UM 1712

I. Consent to be Bound:

This general protective order governs the use of Confidential Information in these proceedings.

Sierra Club (Party) agrees to be bound by the terms of the general protective order and certifies that it has an interest in these proceedings that is not adequately represented by other parties to the proceedings.

Signature: 

Printed Name: Travis Ritchie

Date: 1-15-15

II. Persons Qualified under Paragraphs 3(a) through 3(d):

Sierra Club (Party) identifies the following person(s) automatically qualified under paragraphs 3(a) through (d).

PRINTED NAME	DATE
Gloria Smith	1-15-15
Derek Nelson	1-15-15
Anthony Paduazo	1-15-15
Kadie McShirley	1-15-15

SIGNATORY PAGE
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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: Sarah Jackson Date: 1-26-15
Printed Name: Sarah Jackson
Address: 485 Mass. Ave Cambridge MA 02139
Employer: Synapse Energy Economics
Job Title: Associate
 Paragraph 10(e) information also provided.

By: Signature: [Signature] Date: 1-26-15
Printed Name: JEREMY FISHER
Address: 485 MASS AVE, CAMBRIDGE MA 02139, SUITE 2
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.

SIGNATORY PAGE
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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: 1/16/15
Printed Name: Tyler Comings
Address: 485 Mass. Ave. Cambridge, MA 02139
Employer: Synapse Energy Economics
Job Title: Senior Associate
 Paragraph 10(e) information also provided.

By: Signature: [Signature] Date: 1/16/2015
Printed Name: DREW FIELDS
Address: 485 MASSACHUSETTS AVE, CAMBRIDGE, MA 02139
Employer: SYNAPSE ENERGY ECONOMICS
Job Title: RESEARCH 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.



Sarah E. Jackson, Associate

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sjackson@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc, Cambridge, MA. Associate, September 2011 – present.

Analyze economic and environmental implications of renewable portfolio standards and clean energy policy scenarios. Investigate electricity market price trends and fluctuations. Maintain our end user and alternative resource sector clients' interests at ISO-NE and PJM stakeholder meetings. Assist clients in navigating RTO market rules, especially regarding reliability assessments for coal-fired power plants and participation of energy efficiency and distributed generation in wholesale capacity markets.

Earthjustice, Oakland, CA. Research and Policy Analyst, 2005 – 2011.

Analyzed federal, state, and local regulations, policies, and environmental planning documents in support of clean air and climate change campaigns. Drafted substantial comment letters on priority issues, often leading to significant policy changes. Advocated at public hearings critiquing proposed policies or regulatory actions. Developed and maintained strong relationships with federal, state, and local agency staff, client groups, community and grassroots groups, technical and scientific experts, and key media contacts. Developed factual basis for and evaluated environmental significance of lawsuits to advance clean air and climate change campaigns

Central Valley Air Quality Coalition, Central Valley, CA.

Chair, Watchdog Committee, 2007 – 2011.

Analyzed and prioritized federal, state, and local regulatory and legislative activities affecting air quality in California's polluted Central Valley. Managed and coordinated with technical consultants on complex regional air pollution clean-up plans. Educated and mobilized committee members and affected communities, empowering them to participate on priority issues. Developed and facilitated technical trainings and educational events for coalition members and citizens.

Steering Committee Member, 2005 – 2011.

Managed and set policy priorities for a diverse coalition of more than 75 community, public health, faith, environmental, and environmental justice organizations and individuals working for clean air in California's Central Valley. Helped develop Strategic Plan for advancing policy priorities and making coalition more effective.

Kopelman & Paige, P.C., Boston, MA. Land Use Paralegal, 2003 – 2005

Performed legal research on subjects such as wetlands protection, coastal management, legality of municipal bylaws, and validity of comprehensive permits in support of Land Use department.

Reviewed and prepared administrative records, briefs, litigation status reports, and other legal documents.

Governor's Office of Energy and Community Services, Concord, NH. *Energy Program Intern*, 2001

Assisted in the research and organizational stages of drafting a State Energy Plan. Participated in the initial implementation of the Energy, Environmental & Economic Integration Project. Special projects relating to energy efficiency and renewable energy.

EDUCATION

Vermont Law School, South Royalton, VT

Master of Environmental Law and Policy, 2003

Mount Holyoke College, South Hadley, MA

Bachelor of Arts in English and Environmental Studies, 2001

PUBLICATIONS

Stanton, E. A., S. Jackson, B. Biewald, M. Whited. 2014. *Final Report: Implications of EPA's Proposed "Clean Power Plan."* Synapse Energy Economics for the National Association of State Utility Consumer Advocates.

Stanton, E.A., B. Biewald, S. Jackson. 2014. *111(d): Next Steps for States*. Synapse webinar presented July 2014.

Stanton, E.A., S. Jackson. 2014. *Draft 111(d) Rule: Issues on Which EPA is Seeking Comment*.

Luckow, P., E. A. Stanton, B. Biewald, S. Fields, S. Jackson, J. Fisher, F. Ackerman. 2014. *CO₂ Price Report, Spring 2014: Includes 2013 CO₂ Price Forecast*. Synapse Energy Economics.

Keith, G., S. Jackson, J. Daniel, K. Takahashi. 2014. *Idaho's Electricity Sources: Current Sources and Future Potential*. Synapse Energy Economics for the Idaho Conservation League.

Ackerman, F., S. Jackson, S. Fields. 2014. *Sustainable Development for the Navajo Nation: Replacing the Navajo Generating Station with Renewable Energy*. Synapse Energy Economics for Chorus Foundation.

Stanton, E. A., S. Jackson, G. Keith, E. Malone, D. White, T. Woolf. 2013. *A Clean Energy Standard for Massachusetts*. Synapse Energy Economics for the Massachusetts Clean Energy Center and the Massachusetts Departments of Energy Resources, Environmental Protection, and Public Utilities.

Stanton, E.A., J. Daniel, F. Ackerman, S. Jackson. 2013. *Review of EPA's June 2013 Steam Electric Effluent Limitations and Guidelines (40 CFR Part 423)*. Synapse Energy Economics for Earthjustice, Environmental Integrity Project, and Sierra Club.

Jackson, S., P. Peterson, D. Hurley, T. Woolf. 2013. *Forecasting Distributed Generation Resources in New England: Distributed Generation Must Be Properly Accounted for in Regional System Planning*. Synapse Energy Economics for E4 Group.

Whited, M., D. White, S. Jackson, P. Knight, E.A. Stanton. 2013. *Declining Markets for Montana Coal*. Synapse Energy Economics for Northern Plains Resource Council.

Keith, G., S. Jackson, A. Napoleon, T. Comings, J. Ramey. 2012. *The Hidden Costs of Electricity: Comparing the Hidden Costs of Power Generation Fuels*. Synapse Energy Economics for Civil Society Institute.

Fisher, J., S. Jackson, B. Biewald. 2012. *The Carbon Footprint of Electricity from Biomass: A Review of the Current State of Science and Policy*. Synapse Energy Economics.

Peterson, P., D. Hurley, S. Jackson, M. Schultz. 2012. *The Road to Better System Planning: ISO-New England's Revised Energy Efficiency Forecast*. Synapse Energy Economics for Connecticut Office of Consumer Counsel.

TESTIMONY

Ohio Public Utilities Commission (Case Nos. 14-841-EL-SSO and 14-842-EL-ATA): Direct testimony on Duke Energy Ohio's proposed Price Stabilization Rider and the potential risk it poses to ratepayers. On behalf of Sierra Club. November 19, 2014.

Resume dated December 2014



Jeremy Fisher, Ph.D., Principal Associate

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jfisher@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Cambridge MA. *Principal Associate, 2013 – present, Scientist, 2007 – 2013.*

Consulting on economic analysis of climate change and energy, carbon, and emissions policies. Quantitative evaluations of regional climate change impact, energy efficiency programs, long- and short-term electric industry planning, carbon reduction planning, and emissions compliance programs.

Tulane University, New Orleans, LA. *Ecology and Evolutionary Biology Postdoctoral Research Scientist, 2006 –2007.*

Determining Hurricane Katrina's impact on Gulf Coast ecosystems using satellite and field data.

University of New Hampshire, Durham, NH. *Earth, Oceans, and Space Postdoctoral Research Scientist, 2006 –2007.*

Organizing team synthesis review of causes and rates of natural rainforest loss in the Amazon basin.

Brown University Watson Institute for International Studies, Providence, RI. *Visiting Fellow, 2007 – 2008.*

Designing study to examine migratory bird response to climate variability in the Middle East.

Brown University Department of Geological Sciences, Providence, RI. *Research Assistant, 2001 –2006.*

Tracking impact of climate change on New England forests from satellites. Working with West African communities to determine impact of climate change and practice on landscape. Modeling coastal power plant effluent from satellite data.

EDUCATION

Brown University, Providence, RI
Doctor of Philosophy in Geological Sciences, 2006

Brown University, Providence, RI
Master of Science in Geological Sciences, 2003

University of Maryland, College Park, MD
Bachelor of Science in Geography and Geology, 2001

FELLOWSHIPS & AWARDS

- *Visiting Fellow*, Watson Institute for International Studies, Brown University, 2007
- *Finalist*, Congressional Fellowship, American Institute of Physics and Geological Society of America, 2007
- *Fellow*, National Science Foundation East Asia Summer Institute (EASI), 2003
- *Fellow*, Henry Luce Foundation at the Watson Institute for International Studies, Brown University, 2003

REPORTS

Vitolo, T., J. Fisher, K. Takahashi. 2014. *TVA's Use of Dispatchability Metrics in Its Scorecard*. Synapse Energy Economics for Sierra Club.

Luckow, P., E. A. Stanton, B. Biewald, S. Fields, S. Jackson, J. Fisher, F. Ackerman. 2014. *CO₂ Price Report, Spring 2014: Includes 2013 CO₂ Price Forecast*. Synapse Energy Economics.

Daniel, J., T. Comings, J. Fisher. 2014. *Comments on Preliminary Assumptions for Cleco's 2014/2015 Integrated Resource Plan*. Synapse Energy Economics for Sierra Club.

Fisher, J., T. Comings, and D. Schlissel. 2014. *Comments on Duke Energy Indiana's 2013 Integrated Resource Plan*. Synapse Energy Economics and Schlissel Consulting for Mullet & Associates, Citizens Action Coalition of Indiana, Earthjustice, and Sierra Club.

Fisher, J., P. Knight, E. A. Stanton, and B. Biewald. 2014. *Avoided Emissions and Generation Tool (AVERT): User Manual*. Version 1.0. Synapse Energy Economics for the U.S. Environmental Protection Agency.

Luckow, P., E. A. Stanton, B. Biewald, J. Fisher, F. Ackerman, E. Hausman. 2013. *2013 Carbon Dioxide Price Forecast*. Synapse Energy Economics.

Knight, P., E. A. Stanton, J. Fisher, B. Biewald. 2013. *Forecasting Coal Unit Competitiveness: Coal Retirement Assessment Using Synapse's Coal Asset Valuation Tool (CAVT)*. Synapse Energy Economics for Energy Foundation.

Takahashi, K., P. Knight, J. Fisher, D. White. 2013. *Economic and Environmental Analysis of Residential Heating and Cooling Systems: A Study of Heat Pump Performance in U.S. Cities*. Proceeding of the 7th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'13), September 12, 2013.

Fagan, R., J. Fisher, B. Biewald. 2013. *An Expanded Analysis of the Costs and Benefits of Base Case and Carbon Reduction Scenarios in the EIPC Process*. Synapse Energy Economics for the Sustainable FERC Project.

Fisher, J. *Sierra Club's Preliminary Comments on PacifiCorp 2013 Integrated Resource Plan*. Oregon Docket LC 57. Synapse Energy Economics for Sierra Club.

Fisher, J., T. Vitolo. 2012. *Assessing the Use of the 2011 TVA Integrated Resource Plan in the Retrofit Decision for Gallatin Fossil Plant*. Synapse Energy Economics for Sierra Club.

Fisher, J., K. Takahashi. 2012. *TVA Coal in Crisis: Using Energy Efficiency to Replace TVA's Highly Non-Economic Coal Units*. Synapse Energy Economics for Sierra Club.

Fisher J., S. Jackson, B. Biewald. 2012. *The Carbon Footprint of Electricity from Biomass: A Review of the Current State of Science and Policy*. Synapse Energy Economics.

Fisher, J., C. James, N. Hughes, D. White, R. Wilson, and B. Biewald. 2011. *Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Quality Management Districts*. Synapse Energy Economics for California Energy Commission.

Fisher, J., F. Ackerman. 2011. *The Water-Energy Nexus in the Western States: Projections to 2100*. Synapse Energy Economics for Stockholm Environment Institute.

Averyt, K., J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, S. Tellinghuisen. 2011. *Freshwater use by US power plants: Electricity's thirst for a precious resource*. Union of Concerned Scientists for the Energy and Water in a Warming World Initiative.

White, D. E., D. Hurley, J. Fisher. 2011. *Economic Analysis of Schiller Station Coal Units*. Synapse Energy Economics for Conservation Law Foundation.

Fisher, J., R. Wilson, N. Hughes, M. Wittenstein, B. Biewald. 2011. *Benefits of Beyond BAU: Human, Social, and Environmental Damages Avoided Through the Retirement of the US Coal Fleet*. Synapse Energy Economics for Civil Society Institute.

Fisher, J., B. Biewald. 2011. *Environmental Controls and the WECC Coal Fleet: Estimating the forward-going economic merit of coal-fired power plants in the West with new environmental controls*. Synapse Energy Economics for Energy Foundation and Western Grid Group.

Hausman, E., V. Sabodash, N. Hughes, J. Fisher. 2011. *Economic Impact Analysis of New Mexico's Greenhouse Gas Emissions Rule*. Synapse Energy Economics for New Energy Economy.

Fisher, J. 2011. *A Green Future for Los Angeles Department of Water and Power: Phasing out Coal in LA by 2020*. Synapse Energy Economics for Sierra Club.

Fisher, J., J. Levy, Y. Nishioka, P. Kirshen, R. Wilson, M. Chang, J. Kallay, C. James. 2010. *Co-Benefits of Energy Efficiency and Renewable Energy in Utah: Air Quality, Health and Water Benefits*. Synapse Energy Economics, Harvard School of Public Health, Tufts University for State of Utah Energy Office.

Biewald, B., D. White, J. Fisher, M. Chang, L. Johnston. 2009. *Incorporating Carbon Dioxide Emissions Reductions in Benefit Calculations for Energy Efficiency: Comments on the Department of Energy's Methodology for Analysis of the Proposed Lighting Standard*. Synapse Energy Economics for the New York Office of Attorney General.

Hausman, E., J. Fisher, L.A. Mancinelli, B. Biewald. 2009. *Productive and Unproductive Costs of CO₂ Cap-and-Trade: Impacts on Electricity Consumers and Producers*. Synapse Energy Economics for the National Association of Regulatory Utility Commissioners, The National Association of State Utility Consumer Advocates (NASUCA), The National Rural Electric Cooperative Association (NRECA), The American Public Power Association (APPA).

Biewald, B., J. Fisher, C. James, L. Johnston, D. Schlissel, R. Wilson. 2009. *Energy Future: A Green Energy Alternative for Michigan*. Synapse Energy Economics for Sierra Club.

James, C., J. Fisher, K. Takahashi. 2009. "Energy Supply and Demand Sectors." *Alaska Climate Change Strategy's Mitigation Advisory Group Final Report: Greenhouse Gas Inventory and Forecast and Policy Recommendations Addressing Greenhouse Gas Reduction in Alaska*. Submitted to the Alaska Climate Change Sub-Cabinet. Synapse Energy Economics for the Center of Climate Strategies.

James, C., J. Fisher, K. Takahashi, B. Warfield. 2009. *No Need to Wait: Using Energy Efficiency and Offsets to Meet Early Electric Sector Greenhouse Gas Targets*. Synapse Energy Economics for Environmental Defense Fund.

James, C., J. Fisher. 2008. *Reducing Emissions in Connecticut on High Electric Demand Days (HEDD)*. Synapse Energy Economics for the Connecticut Department of Environmental Protection and the US Environmental Protection Agency.

Napoleon, A., J. Fisher, W. Steinhurst, M. Wilson, F. Ackerman, M. Resnikoff. 2008. *The Real Costs of Cleaning up Nuclear Waste: A Full Cost Accounting of Cleanup Options for the West Valley Nuclear Waste Site*. Synapse Energy Economics et al.

James, C., F. Fisher. 2008. *Reducing Emissions in Connecticut on High Electric Demand Days (HEDD)*. Synapse Energy Economics for the CT Department of Environmental Protection and the U.S. Environmental Protection Agency.

Hausman, E., J. Fisher, B. Biewald. 2008. *Analysis of Indirect Emissions Benefits of Wind, Landfill Gas, and Municipal Solid Waste Generation*. Synapse Energy Economics for US. Environmental Protection Agency.

Schlissel, D., J. Fisher. 2008. *A preliminary analysis of the relationship between CO₂ emission allowance prices and the price of natural gas*. Synapse Energy Economics for Energy Foundation.

PEER-REVIEWED ARTICLES

Buonocore, J., P. Luckow, G Norris, J.D. Spengler, B. Biewald, J.I. Fisher, J.I. Levy. 2014. "Public Health and Climate Benefits of Energy Efficiency and Renewable Energy Measures." *Science*, manuscript in review.

Ackerman, F., J.I. Fisher. 2013. "Is there a water–energy nexus in electricity generation? Long-term scenarios for the western United States." *Energy Policy*, August: 235–241.

Averyt, K., J. Macknick, J. Rogers, N. Madden, J. Fisher, J.R. Meldrum, and R. Newmark. 2012. "Water use for electricity in the United States: An analysis of reported and calculated water use information for 2008." *Environmental Research Letters*. In press (accepted Nov. 2012).

Morisette, J. T., A. D. Richardson, A. K. Knapp, J.I. Fisher, E. Graham, J. Abatzoglou, B.E. Wilson, D. D. Breshears, G. M. Henebry, J. M. Hanes, and L. Liang. 2009. "Tracking the rhythm of the seasons in the face of global change: Challenges and opportunities for phenological research in the 21st Century." *Frontiers in Ecology* 7 (5): 253–260.

Biewald, B., L. Johnston, J. Fisher. 2009. "Co-benefits: Experience and lessons from the US electric sector." *Pollution Atmosphérique*, April 2009: 113-120.

Fisher, J.I., G.C. Hurtt, J.Q. Chambers, Q. Thomas. 2008. "Clustered disturbances lead to bias in large-scale estimates based on forest sample plots." *Ecology Letters* 11 (6): 554–563.

Chambers, J.Q., J.I. Fisher, H. Zeng, E.L. Chapman, D.B. Baker, and G.C. Hurtt. 2007. "Hurricane Katrina's Carbon Footprint on US Gulf Coast Forests." *Science* 318 (5853): 1107. DOI: 10.1126/science.1148913.

Fisher, J.I., A.D. Richardson, and J.F. Mustard. 2007. "Phenology model from surface meteorology does not capture satellite-based greenup estimations." *Global Change Biology* 13:707–721.

Fisher, J.I., J.F. Mustard. 2007. "Cross-scalar satellite phenology from ground, Landsat, and MODIS data." *Remote Sensing of Environment* 109:261–273.

Fisher, J.I., J.F. Mustard, and M. Vadeboncoeur. 2006. "Green leaf phenology at Landsat resolution: Scaling from the field to the satellite." *Remote Sensing of Environment* 100 (2): 265–279.

Fisher, J.I., J.F. Mustard. 2004. "High spatial resolution sea surface climatology from Landsat thermal infrared data." *Remote Sensing of Environment* 90:293–307.

Fisher, J.I., J. F. Mustard, and P. Sanou. 2004. "Policy imprints in Sudanian forests: Trajectories of vegetation change under land management practices in West Africa." *Submitted, International Remote Sensing*.

Fisher, J.I., S.J. Goetz. 2001. "Considerations in the use of high spatial resolution imagery: an applications research assessment." Proceedings at the American Society for Photogrammetry and Remote Sensing (ASPRS) Conference in St. Louis, MO.

SELECTED ABSTRACTS

Fisher, J.I., "Phenological indicators of forest composition in northern deciduous forests." *American Geophysical Union*. San Francisco, CA. December 2007.

Fisher, J.I., A.D. Richardson, and J.F. Mustard. "Phenology model from weather station meteorology does not predict satellite-based onset." *American Geophysical Union*. San Francisco, CA. December 2006.

Chambers, J., J.I. Fisher, G. Hurtt, T. Baker, P. Camargo, R. Campanella, *et al.*, "Charting the Impacts of Disturbance on Biomass Accumulation in Old-Growth Amazon Forests." *American Geophysical Union*. San Francisco, CA. December 2006.

Fisher, J.I., A.D. Richardson, and J.F. Mustard. "Phenology model from surface meteorology does not capture satellite-based greenup estimations." *American Geophysical Union. Eos Trans.* 87(52). San Francisco, CA. December 2006.

Fisher, J.I., J.F. Mustard, and M. Vadeboncoeur. "Green leaf phenology at Landsat resolution: scaling from the plot to satellite." *American Geophysical Union. Eos Trans.* 86(52). San Francisco, CA. December 2005.

Fisher, J.I., J.F. Mustard. "Riparian forest loss and landscape-scale change in Sudanian West Africa." *Ecological Association of America*. Portland, Oregon. August 2004.

Fisher, J.I., J.F. Mustard. "High spatial resolution sea surface climatology from Landsat thermal infrared data." *American Society for Photogrammetry and Remote Sensing (ASPRS) New England Region Technical Meeting*. Kingston, Rhode Island. November, 2004.

Fisher, J.I., J.F. Mustard, and P. Sanou. "Trajectories of vegetation change under controlled land-use in Sudanian West Africa." *American Geophysical Union. Eos Trans.* 85(47). San Francisco, CA. December 2004.

Fisher, J.I., J.F. Mustard. "Constructing a climatology of Narragansett Bay surface temperature with satellite thermal imagery." *The Rhode Island Natural History Survey Conference*. Cranston, RI. March, 2003.

Fisher, J.I., J.F. Mustard. "Constructing a high resolution sea surface climatology of Southern New England using satellite thermal imagery." *New England Estuarine Research Society*. Fairhaven, MA. May, 2003.

Fisher, J.I., J.F. Mustard. "High spatial resolution sea surface climatology from Landsat thermal infrared data." *Ecological Society of America Conference*. Savannah, GA. August, 2003.

Fisher, J.I., S.J. Goetz. "Considerations in the use of high spatial resolution imagery: an applications research assessment." *American Society for Photogrammetry and Remote Sensing (ASPRS) Conference Proceedings*, St. Louis, MO. March, 2001.

SEMINARS AND PRESENTATIONS

Fisher, J. 2014. "Planning in Vertically Integrated Utilities." Presentation to the U.S. Environmental Protection Agency in Washington, DC, May 22, 2014.

Fisher, J. 2013. "IRP Best Practices Stakeholder Perspectives." Presentation at Indiana Utility Regulatory Commission Emerging Issues in IRP conference. October 17, 2013.

Fisher, J., P. Knight. 2013. *Avoided Emissions and Generation Tools (AVERT): An Introduction.* Presentation for EPA and various state departments of environmental quality/protection.

Takahashi, K., J. Fisher. 2013. "Greening TVA: Leveraging Energy Efficiency to Replace TVA's Highly Uneconomic Coal Units." Presentation at the ACEEE National Conference on Energy Efficiency as a Resource, September 23, 2013.

Fisher, J. 2011. "Emissions Reductions from Renewable Energy and Energy Efficiency in California Air Districts." Presentation for EPA State Climate and Energy Program, June 14, 2011.

Fisher, J., B. Biewald. 2011. "WECC Coal Plant Retirement Based On Forward-Going Economic Merit." Presentation for Western Grid Group, January 10, 2011.

Fisher, J. 2010. "Protecting Electricity and Water Consumers in a Water-Constrained World." Presentation to the National Association of State Utility Consumer Advocates, November 16, 2010.

James, C., J. Fisher, D. White, and N. Hughes. 2010. "Quantifying Criteria Emissions Reductions in CA from Efficiency and Renewables." CEC / PIER Air Quality Webinar Series, October 12, 2010.

Fisher, J. 2008. "Climate Change, Water, and Risk in Electricity Planning." Presentation at National Association of Regulatory Utility Commissioners (NARUC) Conference in Portland, OR, July 22, 2008.

Fisher, J., E. Hausman, and C. James. 2008. "Emissions Behavior in the Northeast from the EPA Acid Rain Monitoring Dataset." Presentation at Northeast States for Coordinated Air Use Management (NESCAUM) conference in Boston, MA, January 30, 2008.

Fisher, J.I., J.F. Mustard, and M. Vadeboncoeur. 2006. "Climate and phenological variability from satellite data. *Ecology and Evolutionary Biology*," Presentation at Tulane University, March 24, 2006.

Fisher, J.I., J.F. Mustard, and M. Vadeboncoeur. 2005. "Anthropogenic and climatic influences on green leaf phenology: new observations from Landsat data." Seminar presentation at the Ecosystems Center at the Marine Biological Laboratory in Woods Hole, MA, September 27, 2005.

Fisher, J.I., J.F. Mustard, "High resolution phenological modeling in Southern New England." Seminar at the Woods Hole Research Center in Woods Hole, MA, March 16, 2005.

TESTIMONY

Oklahoma Corporation Commission (Case No. PUD 201400): Direct testimony comparing the modeling performed by Oklahoma Gas & Electric in support of its request for authorization and cost recovery of a Clean Air Act compliance plan and Mustang modernization against best practices in resource planning. On behalf of Sierra Club. December 16, 2014.

New Mexico Public Regulation Commission (Case 12-00390-UT): Direct and surrebuttal testimony evaluating the economic modeling performed by Public Service Company of New Mexico in support of its application for certificate of public convenience and necessity for the acquisition of San Juan

Generating Station and Palo Verde units. On behalf of New Energy Economy. August 29, 2014; December 29, 2014.

Wyoming Public Service Commission (Docket No. 20000-446-ER-14): Direct testimony in the matter of the application of Rocky Mountain Power for authority to increase its retail electric utility service rates in Wyoming approximately \$36.1 million per year or 5.3 percent. On behalf of Sierra Club. July 25, 2014.

Indiana Utility Regulatory Commissions (Cause No. 44446): Direct testimony evaluating the economic modeling performed on behalf of Vectren South in support of its application for certificate of public convenience and necessity for various retrofits at Brown 1 & 2, Culley 3 and Culley plant, and Warrick 4. On behalf of Sierra Club, Citizens Action Coalition, and Valley Watch. May 28, 2014.

Utah Public Service Commission (Docket No. 13-035-184): Direct testimony in the matter of the application of Rocky Mountain Power for authority to increase its retail electric utility service rates in Utah and for approval of its proposed electric service schedules and electric service regulations. On behalf of Sierra Club. May 1, 2014.

Louisiana Public Service Commission (Docket No. U-32507): Direct testimony regarding the application of Cleco Power LLC for: (i) authorization to install emissions control equipment at certain of its generating facilities in order to comply with the federal national emissions standards for hazardous air pollutants from coal and oil-fired electric utility steam generating units rule; and (ii) authorization to recover the costs associated with the emissions control equipment in LPSC jurisdictional rates. ON behalf of Sierra Club. November 8, 2013.

Nevada Public Utilities Commission (Docket No. 13-07021): Direct testimony regarding a joint application of Nevada Power Company d/b/a NV Energy, Sierra Pacific Power Company d/b/a NV Energy (referenced together as "NV Energy, Inc.") and MidAmerican Energy Holdings Company ("MidAmerican") for approval of a merger of NV Energy, Inc. with MidAmerican. On behalf of Sierra Club. October 24, 2013.

Indiana Utility Regulatory Commission (Cause No. 44339): Direct testimony in the matter of Indianapolis Power & Light Company's application for a Certificate of Public Convenience and Necessity for the construction of a combined cycle gas turbine generation facility. On behalf of Citizens Action Coalition of Indiana. August 22, 2013.

Indiana Utility Regulatory Commission (Cause No. 44242): Direct and surrebuttal testimony regarding Indianapolis Power & Light Company's petition for approval of clean energy projects and qualified pollution control property. On behalf of Sierra Club. January 28, 2013; April 3, 2013.

Wyoming Public Service Commission (Docket 2000-418-EA-12): Direct testimony regarding the application of PacifiCorp for approval of a certificate of public convenience and necessity to construct selective catalytic reduction systems on the Jim Bridger Units 3 and 4. On behalf of Sierra Club. February 1, 2013.

Public Service Commission of Wisconsin (Docket No. 6690-CE-197): Direct, rebuttal, and surrebuttal testimony regarding Wisconsin Public Service Corporation's application for authority to construct and place in operation a new multi-pollutant control technology system for Unit 3 of Weston Generating Station. On behalf of Clean Wisconsin. Direct testimony submitted November 15, 2012, rebuttal testimony submitted December 14, 2012, surrebuttal testimony submitted January 7, 2013.

Utah Public Service Commission (Docket 12-035-92): Direct, surrebuttal, and cross-answering testimony regarding Rocky Mountain Power's request for approval to construct Selective Catalytic Reduction systems at Jim Bridger units 3 and 4. On behalf of Sierra Club. November 30, 2012.

Oregon Public Utility Commission (Docket UE 246): Direct testimony in the matter of PacifiCorp's filing of revised tariff schedules for electric service in Oregon. On behalf of Sierra Club. June 20, 2012.

Kentucky Public Service Commission (Docket 2011-00401): Direct testimony regarding the application of Kentucky Power Company for approval of its 2011 environmental compliance plan, for approval of its amended environmental cost recovery surcharge tariff, and for the granting of a certificate of public convenience and necessity for the construction and acquisition of related facilities. On behalf of Sierra Club. March 12, 2012.

Kentucky Public Service Commission (Dockets 2011-00161/2011-00162): Direct testimony regarding the application of Kentucky Utilities/Louisville Gas and Electric Company for certificates of public convenience and necessity and approval of its 2011 compliance plan for recovery by environmental surcharge. On behalf of Sierra Club and Natural Resources Defense Council (NRDC). September 16, 2011.

Kansas Corporation Commission (Docket 11-KCPE-581-PRE): Direct testimony in the matter of the petition of Kansas City Power & Light (KCP&L) for determination of the ratemaking principles and treatment that will apply to the recovery in rates of the cost to be incurred by KCP&L for certain electric generating facilities under K.S.A. 66-1239. On behalf of Sierra Club. June 3, 2011.

Utah Public Service Commission (Docket 10-035-124): Direct testimony in the matter of the application of Rocky Mountain Power for authority to increase its retail electric utility service rates in Utah and approval of its proposal electric service schedules and electric service regulations. On behalf of Sierra Club. May 26, 2011.

Wyoming Public Service Commission (Docket 20000-384-ER-10): Direct testimony in the matter of the application of Rocky Mountain Power for authority to increase its retail electric utility rates in Wyoming approximately \$97.9 million per year or an average overall increase of 17.3 percent. On behalf of Powder River Basin Resource Council. April 11, 2011.

Resume dated December 2014



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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, July 2014 – present, *Associate*, July 2011 – July 2014.

Conducts research on energy system planning and coal plant economics, and performs economic modeling and analysis in support of a wide range of projects. Performs economic impact and benefit-cost analyses, statistical modeling, and research on environmental issues. Recent work includes developing economic impacts of energy efficiency programs in Vermont and a scenario of clean energy investments for the U.S.

Ideas42, Boston, MA. *Senior Associate*, 2010 – 2011.

Organized studies analyzing behavior of consumers regarding finances, and worked with top researchers in behavioral economics. Managed implementation and data analysis for a study of mitigation of default for borrowers that were at-risk of delinquency. Performed case studies for World Bank on financial innovations in developing countries.

Economic Development Research Group Inc., Boston, MA. *Research Analyst, Economic Consultant*, 2005 – 2010.

Performed economic impact modeling and benefit-cost analyses using IMPLAN and REMI for transportation and renewable energy projects, including support for Federal stimulus applications. Performed statistical modeling, including results on the timing of effects of highway construction on economic growth in Appalachia. Developed a unique Web-tool for the National Academy of Sciences on linkages between economic development and transportation, and presented findings to state government officials around the country. Created economic development strategies and improvements to company's economic development software tool.

Harmon Law Offices, LLC., Newton, MA. *Billing Coordinator, Accounting Liaison*, 2002 – 2005.

Allocated IOLTA and Escrow funds, performed bank reconciliation and accounts receivable. Projected legal fees and costs for cases at the firm.

Massachusetts Department of Public Health, Boston, MA. *Data Analyst (contract)*, 2002.

Designed statistical programs using SAS based on data taken from health-related surveys. Extrapolated trends in health awareness and developed benchmarks for performance of clinics and other healthcare facilities for statewide assessment.

EDUCATION

Tufts University, Medford, MA
Master of Arts in Economics, 2007

Boston University, Boston, MA
Bachelor of Arts in Mathematics and Economics, 2002. *Cum Laude*, Dean's Scholar.

ADDITIONAL SKILLS

Software: MS Office, STATA, SPSS, SAS, REMI, IMPLAN, Mathematica

Programming: C++

Languages: Conversant in French

PUBLICATIONS

Takahashi, K. 2014. *Maximizing Public Benefit through Energy Efficiency Investments*. Synapse Energy Economics for Sierra Club.

Comings, T., S. Fields, K. Takahashi, G. Keith. 2014. *Employment Effects of Clean Energy Investments in Montana*. Synapse Energy Economics for Montana Environmental Information Center and Sierra Club.

Daniel, J., T. Comings, J. Fisher. 2014. *Comments on Preliminary Assumptions for Cleco's 2014/2015 Integrated Resource Plan*. Synapse Energy Economics for Sierra Club.

Fisher, J., T. Comings, D. Schlissel. 2014. *Comments on Duke Energy Indiana's 2013 Integrated Resource Plan*. Synapse Energy Economics and Schlissel Consulting for Mullet & Associates, Citizens Action Coalition of Indiana, Earthjustice, and Sierra Club.

Comings, T., K. Takahashi, G. Keith. 2013. *Employment Effects of Investing in Select Electricity Resources in Washington State*. Synapse Energy Economics for Sierra Club.

Stanton, E. A., T. Comings, K. Takahashi, P. Knight, T. Vitolo, E. Hausman. 2013. *Economic Impacts of the NRDC Carbon Standard*. Synapse Energy Economics for Natural Resources Defense Council (NRDC).

Ackerman, F., T. Comings, P. Luckow. 2013. *A Review of Consumer Benefits from a Corporate Average Fuel Economy (CAFE) Standards*. Synapse Energy Economics for Consumer Union.

Comings, T., P. Knight, E. Hausman. 2013. *Midwest Generation's Illinois Coal Plants: Too Expensive to Compete? (Report Update)* Synapse Energy Economics for Sierra Club.

Stanton, E. A., F. Ackerman, T. Comings, P. Knight, T. Vitolo, E. Hausman. 2013. *Will LNG Exports Benefit the United States Economy?* Synapse Energy Economics for Sierra Club.

Vitolo, T., G. Keith, B. Biewald, T. Comings, E. Hausman, P. Knight. 2013. *Meeting Load with a Resource Mix Beyond Business as Usual: A regional examination of the hourly system operations and reliability*

implications for the United States electric power system with coal phased out and high penetrations of efficiency and renewable generating resources. Synapse Energy Economics for Civil Society Institute.

Keith, G., S. Jackson, A. Napoleon, T. Comings, J. Ramey. 2012. *The Hidden Costs of Electricity: Comparing the Hidden Costs of Power Generation Fuels.* Synapse Energy Economics for Civil Society Institute.

Fagan, R., M. Chang, P. Knight, M. Schultz, T. Comings, E. Hausman, R. Wilson. 2012 *The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region.* Synapse Energy Economics for Energy Future Coalition.

Bower, S., S. Huntington, T. Comings, W. Poor. 2012. *Economic Impacts of Efficiency Spending in Vermont: Creating an Efficient Economy and Jobs for the Future.* Optimal Energy, Synapse Energy Economics, and Vermont Department of Public Service for American Council for an Energy-Efficient Economy (ACEEE).

Comings, T., E. Hausman. 2012. *Midwest Generation's Illinois Coal Plants: Too Expensive to Compete?* Synapse Energy Economics for Sierra Club.

Wolf, T., J. Kallay, E. Malone, T. Comings, M. Schultz, J. Conyers. 2012. *Commercial & Industrial Customer Perspectives on Massachusetts Energy Efficiency Programs.* Synapse Energy Economics for Massachusetts Energy Efficiency Advisory Council.

Hornby, R., T. Comings. 2012. *Comments on Draft 2012 Integrated Resource Plan for Connecticut (January 2012).* Synapse Energy Economics for AARP.

Hornby, R., D. White, T. Vitolo, T. Comings, K. Takahashi. 2012. *Potential Impacts of a Renewable and Energy Efficiency Portfolio Standard in Kentucky.* Synapse Energy Economics for Mountain Association for Community Economic Development and the Kentucky Sustainable Energy Alliance.

Hausman, E., T. Comings, G. Keith. 2012. *Maximizing Benefits: Recommendations for Meeting Long-Term Demand for Standard Offer Service in Maryland.* Synapse Energy Economics for Sierra Club.

Keith, G., B. Biewald, E. Hausman, K. Takahashi, T. Vitolo, T. Comings, P. Knight. 2011. *Toward a Sustainable Future for the U.S. Power Sector: Beyond Business as Usual 2011.* Synapse Energy Economics for Civil Society Institute.

Hausman, E., T. Comings, K. Takahashi, R. Wilson, W. Steinhurst, N. Hughes, G. Keith. 2011. *Electricity Scenario Analysis for the Vermont Comprehensive Energy Plan 2011.* Synapse Energy Economics for the Vermont Department of Public Service.

Steinhurst, W., T. Comings. 2011. *Economic Impacts of Energy Efficiency Investments in Vermont.* Synapse Energy Economics for the Vermont Department of Public Service.

Petraglia, L., T. Comings, G. Weisbrod. 2010. *Economic Development Impacts of Energy Efficiency and Renewable Energy in Wisconsin.* Economic Development Research Group and PA Consulting Group for Wisconsin Department of Administration.

Economic Development Research Group. 2009. *Economic Assessment of Proposed Brockton Power Facility*. Prepared for Brockton Power Company.

Economic Development Research Group and KEMA NV. 2009. *Economic Benefits of Connecticut's Clean Energy Program*. Prepared for the Connecticut Clean Energy Fund.

Howland, J., D. Murrow, L. Petraglia, T. Comings. 2009. *Energy Efficiency: Engine of Economic Growth in Eastern Canada*. Economic Development Research Group and Environment Northeast.

Economic Development Research Group and KEMA NV. 2008. *New York Renewable Portfolio Standard: Economic Benefits Report*. Prepared for New York State Energy Research and Development (NYSERDA).

Economic Development Research Group and Navigant Consulting. 2008. *Economic Potential of an Advanced Biofuels Sector in Massachusetts*. Prepared for the Massachusetts Office of Energy and Environmental Affairs.

Economic Development Research Group. 2006. *Environmental Impacts of Massachusetts Turnpike and Central Artery/Tunnel Projects*. Prepared for the Massachusetts Turnpike Authority.

TESTIMONY

Ohio Public Utilities Commission (Case No. 14-1297-EL-SSO): Direct testimony evaluating the assumptions and analysis used by FirstEnergy Ohio in support of its application for approval of an electric security plan and related Retail Rate Stability Rider. On behalf of Sierra Club. December 22, 2014.

Oklahoma Corporation Commission (Cause No. PUD 201400229): Direct testimony evaluating the assumptions in the analysis supporting Oklahoma Gas & Electric's request for authorization and cost recovery of a Clean Air Act compliance plan and Mustang modernization. On behalf of Sierra Club. December 16, 2014.

Maryland Public Service Commission (Case No. 9361): Direct testimony on the economic impact analysis filed by Exelon Corporation and Pepco Holdings, Inc. in their joint petition for the merger of the two entities. On behalf of the Maryland Office of the People's Counsel. December 8, 2014.

State of New Jersey Board of Public Utilities (Docket No. EM14060581): Direct testimony on the economic impact analysis filed by Exelon Corporation and Pepco Holdings, Inc. in their joint petition for the merger of the two entities. On behalf of the New Jersey Division of Rate Counsel. November 14, 2014.

District of Columbia Public Service Commission (Formal Case No. 1119): Direct testimony evaluating the economic impact analysis of the proposed Exelon-Pepco merger. On behalf of the District of Columbia Government. November 3, 2014.

Kentucky Public Service Commission (Case No. 2013-00259): Direct and supplemental testimony regarding East Kentucky Power Cooperative's Application for Cooper Station Retrofit and Environmental

Surcharge Cost Recovery. On behalf of Sonia McElroy and Sierra Club. November 27, 2013 and December 27, 2013.

Indiana Utility Regulatory Commission (Cause No. 44339): Direct testimony in the Matter of Indianapolis Power & Light Company's Application for a Certificate of Public Convenience and Necessity for the Construction of a Combined Cycle Gas Turbine Generation Facility. On behalf of Citizens Action Coalition of Indiana. August 22, 2013.

Resume dated December 2014



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PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Research Associate*, May 2013 – present.

Provides consulting and researching services and assists in writing testimony and reports on a wide range of issues, including employment impacts of investments in renewable and traditional energy projects, demand response and ancillary services inside and outside of capacity markets, energy efficiency cost-effectiveness and savings, and utility Integrated Resource Planning practices.

Worldwatch Institute, Washington, DC. *Climate and Energy Research Intern*, January 2013 – April 2013.

Analyzed global climate and energy policy for contribution to publications, funding proposals, and blogs. Special focus on establishing renewable energy targets and creating energy roadmaps for the Caribbean. Provided research and analytical support for the Caribbean Sustainable Energy Roadmap project. Assisted with researching and writing a climate finance overview paper for members of a population and climate change working group.

Brown University Climate and Development Lab, Providence, RI. *Researcher*, August 2011 – May 2013.

Researched topics related to climate finance, with a special focus on funding for Least Developed Countries. Analyzed indicators of climate justice internationally, including foreign direct investment in both clean and dirty energy technologies in Latin America and the Caribbean. Co-authored multiple policy briefs for the International Institute for Environment and Development and the European Capacity Building Initiative.

Green Edge, LLC, New York, NY. *Research Intern*, Summer 2010.

Analyzed corporate sustainability ranking systems and contributed to a published report. Researched similarities and differences among multiple prominent corporate sustainability rankings systems and presented results weekly.

Brown University Sustainable Consulting Partnership, Providence, RI. *Vice President of Member Relations, Senior Consultant, Project Leader*, 2009 – 2012.

Collaborated with community stakeholders to develop and execute community sustainability projects, including an energy consumption behavior change campaign.

EDUCATION

Brown University, Providence, RI

Bachelor of Arts in Environmental Studies and Bachelor of Arts in Hispanic Studies, 2012

PUBLICATIONS

Peterson, P., S. Fields, M. Whited. 2014. *Balancing Market Opportunities in the West: How participation in an expanded balancing market could save customers hundreds of millions of dollars.* Synapse Energy Economics for the Western Grid Group.

Comings, T., S. Fields, K. Takahashi, G. Keith. 2014. *Employment Effects of Clean Energy Investments in Montana.* Synapse Energy Economics for Montana Environmental Information Center and Sierra Club.

Luckow, P., J. Daniel, S. Fields, E. A. Stanton, B. Biewald. 2014. "CO₂ Price Forecast: Planning for Future Environmental Regulations." *EM Magazine*, June 2014, 57-59.

Peterson, P., M. Whited, S. Fields. 2014. *Synapse Comments on FAST Proposals in ERCOT.* Synapse Energy Economics for Sierra Club.

Hornby, R., N. Brockway, M. Whited, S. Fields. 2014. *Time-Varying Rates in the District of Columbia.* Synapse Energy Economics for the Office of the People's Counsel for the District of Columbia.

Luckow, P., E. A. Stanton, B. Biewald, S. Fields, S. Jackson, J. Fisher, F. Ackerman. 2014. *CO₂ Price Report, Spring 2014: Includes 2013 CO₂ Price Forecast.* Synapse Energy Economics.

Hurley, D., P. Knight, J. Daniel, S. Fields. 2014. *Brayton Point Capacity Payment Requirement Analysis.* Synapse Energy Economics for Consumer Advocates of New England and the New Hampshire Office of the Consumer Advocate.

Peterson, P., M. Whited, S. Fields. 2014. *Demonstrating Resource Adequacy in ERCOT: Revisiting the ERCOT Capacity, Demand and Reserves Forecasts.* Synapse Energy Economics for Sierra Club, Lone Star Chapter.

Daniel, J., S. Fields, and D. Hurley. 2014. *Memorandum Regarding an Updated Economic Analysis of Schiller Station Coal Units.* Synapse Energy Economics for the Conservation Law Foundation.

Ackerman, F., S. Jackson, S. Fields. 2014. *Sustainable Development for the Navajo Nation: Replacing the Navajo Generating Station with Renewable Energy.* Synapse Energy Economics for the Chorus Foundation.

Malone, E. T. Woolf, K. Takahashi, S. Fields. 2013. "Appendix D: Energy Efficiency Cost-Effectiveness Tests." *Readying Michigan to Make Good Energy Decisions: Energy Efficiency.* Synapse Energy Economics for the Council of Michigan Foundations.

Ciplet, D., J. T. Roberts, M. Khan, S. Fields and K. Madden. 2013. *Least Developed, Most Vulnerable: Have Climate Finance Promises Been Fulfilled for the LDCs?* European Capacity Building Initiative.

Ciplet, D., S. Fields, et al. 2012. *The eight unmet promises of fast-start climate finance.* International Institute for Environment and Development.

Ciplet, D., J. T. Roberts, M. Khan, L. He and S. Fields. 2011. *Adaptation finance: How can Durban deliver on past promises?* International Institute for Environment and Development.

Resume dated August 2014

CERTIFICATE OF SERVICE

I hereby certify that on this 27th day of January, 2015, I caused to be served the foregoing SIGNATORY PAGES 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 27th day of January, 2015 at San Francisco, CA.

/s/ Derek Nelson

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