

## **Ariel I. Horowitz, Ph.D., Senior Associate**

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### **PROFESSIONAL EXPERIENCE**

**Synapse Energy Economics Inc.**, Cambridge, MA. *Senior Associate*, September 2015—present.

Provides consulting and researching services and assists in writing testimony and reports on a wide range of issues related to the electric industry.

**Project Drawdown Coalition**, *Research Fellow*, Summer 2015.

Modeled the technical feasibility, cost, and carbon savings associated with significant scale-up of energy storage in grid, building, and vehicle applications.

**Tufts Green Energy and Nanostructured Electronics Laboratory**, Medford, MA. *Research Assistant*, 2011 – 2015.

Conducted thesis research concerning the use of sol-gel chemistry to create novel gel electrolytes for energy storage applications. Designed and analyzed novel syntheses, processing techniques, and materials, including end-of-service materials recovery and high-performance device testing.

**Fletcher School Center for International Environment and Resource Policy**, Medford, MA. *Research Assistant*, 2012—2015.

Tracked reactive nitrogen species in the Central Valley of California using multiple metrics approach. Evaluated economic and health impacts by integrating multiple data sources with spatial analysis, custom Python scripts, and other techniques.

**U.S. Department of Agriculture**, Crop Science Conversion and Engineering Unit, Wyndmoor, PA. *Research Assistant*, Summer 2009.

Designed catalyst system to be added to biofuel production reactor and analyzed environmental and economic impacts of different feedstock processing models.

### **EDUCATION**

**Tufts University**, Medford, MA

Doctor of Philosophy in Chemical Engineering, 2015; Dean's Fellow

**Swarthmore College**, Swarthmore, PA

Bachelor of Science in Engineering, minors in Chemistry and French, 2010

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## PUBLICATIONS

Whited, M., A. I. Horowitz, T. Vitolo, W. Ong, T. Woolf. 2017. *Distributed Solar in the District of Columbia: Policy Options, Potential, Value of Solar, and Cost-Shifting*. Synapse Energy Economics for the Office of the People's Counsel for the District of Columbia.

Knight, P., P. Luckow, B. Biewald, A. I. Horowitz, A. Allison, F. Ackerman. 2017. *New England's Shrinking Need for Natural Gas: An analysis of policy impacts on natural gas use in New England's electric sector*. Synapse Energy Economics for the Connecticut Fund for the Environment, Consumers for Sensible Energy, Mass Energy Consumers Alliance, Pipe Line Awareness Network for the Northeast, Sierra Club Connecticut, and Sierra Club Massachusetts.

Comings, T., A. I. Horowitz, and K. Takahashi. 2017. *Comments on Portland General Electric's 2016 Integrated Resource Plan*. Submitted to the Public Utility Commission of Oregon on behalf of Sierra Club, January 24, 2017.

Horowitz, A. I., S. Fields, B. Fagan. 2016. *Energy Storage Evaluation: Cost and Benefits Analysis for a Grid-Scale Battery Energy Storage System*. Prepared by Synapse Energy Economics for a renewable energy developer.

Fisher, J. and A. I. Horowitz. 2016. *Expert Report: State of PREPA's System, Load Forecast, Capital Budget, Fuel Budget, Purchased Power Budget, Operations Expense Budget*. Prepared for the Puerto Rico Energy Commission regarding Matter No. CEPR-AP-2015-0001, November 23, 2016.

Comings, T. and A. I. Horowitz. 2016. *Comments on Portland General Electric's 2016 Integrated Resource Plan*. Submitted on behalf of Sierra Club, October 26, 2016.

Fisher, J., P. Luckow, A. I. Horowitz, T. Comings, A. Allison, E.A. Stanton, S. Jackson, K. Takahashi. 2016. *Michigan Compliance Assessment for the Clean Power Plan: MPSC/MDEQ EPA 111(d) Impact Analysis*. Prepared for Michigan Public Service Commission, Michigan Department of Environmental Quality, and Michigan Agency for Energy.

Fisher, J. and A. I. Horowitz. 2016. *Comments on PacifiCorp's 2017-2021 Renewable Portfolio Standard Implementation Plan*. Submitted to the Public Utility Commission of Oregon on behalf of Sierra Club, September 9, 2016.

Fisher, J., A. I. Horowitz, J. Migden-Ostrander, T. Woolf. 2016. *Puerto Rico Electric Power Authority's 2015 Integrated Resource Plan*. Prepared for Puerto Rico Energy Commission.

Jackson, S., P. Luckow, E.A. Stanton, A. I. Horowitz, P. Peterson, T. Comings, J. Daniel, and T. Vitolo. 2016. *Reimagining Brayton Point: A Guide to Assessing Reuse Options for the Somerset Community*. Prepared by Synapse Energy Economics for Coalition for Clean Air South Coast, Clean Water Action, and Toxics Action Center.

Stanton, E. A., P. Knight, A. Allison, T. Comings, A. I. Horowitz, W. Ong, N. R. Santen, K. Takahashi. 2016. *The RGGI Opportunity 2.0: RGGI as the Electric Sector Compliance Tool to Achieve 2030 State Climate*

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*Targets*. Synapse Energy Economics for Sierra Club, Pace Energy and Climate Center, and Chesapeake Climate Action Network.

Stanton, E. A., P. Knight, A. Allison, T. Comings, A. I. Horowitz, W. Ong, N. R. Santen, K. Takahashi. 2016. *The RGGI Opportunity: RGGI as the Electric Sector Compliance Tool to Achieve 2030 State Climate Targets*. Synapse Energy Economics for Sierra Club, Pace Energy and Climate Center, and Chesapeake Climate Action Network.

Vitolo, T., A. I. Horowitz, P. Luckow, and N.R. Santen. 2015. *Meeting Maryland's RPS*. Synapse Energy Economics for the Maryland Climate Coalition.

Horowitz, A. I., S. Jackson, A. Allison, E. A. Stanton. 2015. *Environmental Justice and the Clean Power Plan*. Synapse Energy Economics for The Energy Foundation.

## TESTIMONY

**Massachusetts Department of Public Utilities (D.P.U. 15-120, D.P.U. 15-121, D.P.U. 15-122/15-123):** Direct testimony of Tim Woolf and Ariel I. Horowitz, PhD, regarding the petitions by National Grid, Unitil, NSTAR, and Eversource Energy for approval of their grid modernization plans. On behalf of Conservation Law Foundation. March 10, 2017.

## TESTIMONY ASSISTANCE

**Public Utilities Commission of Nevada (Docket Nos. 16-07001, 16-07007, and 16-08027):** Direct testimony of Jeremy Fisher regarding the economic viability of the North Valmy coal plant. On behalf of Sierra Club. September 30, 2016.

**California Public Utilities Commission (Docket 15-09-007):** Direct testimony of Jeremy Fisher regarding PacifiCorp's application for authority to sell Utah mining assets on a post-hoc basis. On behalf of Sierra Club. July 11, 2016.

**Washington Utilities and Transportation Commission (Docket UE-152253):** Response, cross-answer, and supplementary cross-answer testimony of Jeremy Fisher regarding the general rate case on behalf of Pacific Power & Light Company. On behalf of Sierra Club. June 1, 2016.

**Georgia Public Service Commission (Docket 40161):** Direct testimony of Jeremy Fisher regarding Georgia Power Company's 2016 Integrated Resource Plan. On behalf of Sierra Club. May 18, 2016.

## JOURNAL ARTICLES

Horowitz, A. I., W. R. Moomaw, D. Liptzin, B. Gramig, C. Reeling, J. Meyer, K. Hurley. 2016. A multiple metrics approach to prioritizing strategies for measuring and managing reactive nitrogen in the San Joaquin Valley of California. *Env. Res. Lett.*, 11, 064011.

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Horowitz, A. I., K. Westerman, M. J. Panzer. 2015. Formulation Influence on the Sol-Gel Formation of Silica-Supported Ionogels. *J. Sol-Gel Sci. Tech.* 78, 34.

Horowitz, A. I., P. Arias, M. J. Panzer. 2015. Spectroscopic Determination of Relative Brønsted Acidity as a Predictor of Reactivity in Aprotic Ionic Liquids. *Chem. Commun.*, 51, 6651.

Horowitz, A. I. and M. J. Panzer. 2014. Poly(dimethylsiloxane)-Supported Ionogels for Energy Applications. *Angew. Chemie Intl. Ed.*, 126, 9938.

Horowitz, A. I., Y. Wang, M. J. Panzer. 2013. Reclamation and reuse of ionic liquids from silica-based ionogels using spontaneous water-driven separation. *Green Chem.*, 15, 3414.

Horowitz, A. I. and M. J. Panzer. 2012. "High-performance, mechanically compliant silica-based ionogels for electrical energy storage applications." *J. Mater. Chem.*, 22, 16534.

## PRESENTATIONS

Horowitz, A.I. Panelist, "State and Federal Policy Modernization to Support a New Grid." Roundtable panelist during The Nature Conservancy's *Maximizing the Benefits from a New, Modern Grid: A Dialogue Among Stakeholders*; March 29, 2017; Cambridge, MA.

Horowitz, A. I., W. R. Moomaw, D. Liptzin, B. Gramig, C. Reeling, J. Meyer, K. Hurley. 2015. "Why Metrics Matter: Prioritizing Strategies for Measuring and Managing Reactive Nitrogen in the San Joaquin Valley of California." Conference of the Canada and United States Societies for Ecological Economics; October 3, 2015; Vancouver, BC.

Horowitz, A. I. and M. J. Panzer. 2014. "Overcoming Miscibility Barriers to Create PDMS-Supported Ionogel Electrolytes with High Ionic Liquid Loading." Materials Research Society Fall Meeting; December 4, 2014; Boston, MA.

Horowitz, A. I. and M. J. Panzer. 2014. "Low-energy recycling of ionic liquids from silica-supported ionogel electrolytes using spontaneous water-driven separation." American Chemical Society Fall Meeting; August 14, 2014; San Francisco, CA.

Horowitz, A. I. and M. J. Panzer. 2012. "A Novel Form of Silica-Based Ionogel Electrolyte Offering Versatility, Stability, and High Performance." American Institute of Chemical Engineers Annual Meeting; October 31, 2012; Pittsburgh, PA.

Horowitz, A. I. 2012. "A Novel, High-Performance Form of Safe, Stable, and Versatile Silica-Based Ionogel Electrolyte for Energy Storage Applications." MIT Energy Initiative/Department of Energy C3E Women in Energy Symposium; September 28, 2012; Cambridge, MA.

Flores, S. and A. I. Horowitz. 2012. "Interfacial Studies of Ionic Gel Electrolytes and High-Surface Carbon Electrodes in Supercapacitors." Tufts Energy Conference; April 21, 2012; Medford, MA.

Horowitz, A. I. and M. J. Panzer. 2011. "Sustainable Post-Processing of Ion Gel Electrolytes for Energy Applications." Tufts Research Day on Sustainability; May 3, 2011; Medford, MA.

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## **PATENTS**

Horowitz, A. I. Silicone-Containing Ionic Materials. U.S. Provisional Patent Application 61/915,793, filed on 13 December, 2014.

*Resume dated April 2017*