



## Mark Jacobson

Professor of Civil and Environmental Engineering and Senior Fellow at the Woods Institute for the Environment

### CONTACT INFORMATION

- **Administrator**

Carmen Torres - Program Administrator

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### Bio

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#### BIO

Mark Z. Jacobson's career has focused on better understanding air pollution and global warming problems and developing large-scale clean, renewable energy solutions to them. Toward that end, he has developed and applied three-dimensional atmosphere-biosphere-ocean computer models and solvers to simulate air pollution, weather, climate, and renewable energy. He has also developed roadmaps to transition states and countries to 100% clean, renewable energy for all purposes and computer models to examine grid stability in the presence of high penetrations of renewable energy.

#### ACADEMIC APPOINTMENTS

- Professor, Civil and Environmental Engineering
- Senior Fellow, Stanford Woods Institute for the Environment

#### ADMINISTRATIVE APPOINTMENTS

- Director, Atmosphere/Energy Program, Department of Civil and Environmental Engineering, (2004- present)

#### HONORS AND AWARDS

- #1 top academic influencer on smart grids, Onalytica (2019)
- #2 top sustainability influencer on environmental sustainability, Onalytica (2019)
- All-electric showcase award, Silicon Valley Clean Energy (2019)
- World's 100 most influential people in climate policy, Apolitical (2019)
- Judi Friedman Lifetime Achievement Award, People's Action for Clean Energy (PACE) (2018)
- Cozzarelli Prize, National Academy of Sciences (2016)
- Grist50, Innovators, organizers, and visionaries who will lead us toward a more sustainable future, Grist (2016)
- Ascent Award, American Geophysical Union (2013)
- Atlas Award Honoring Climate Heroes, Atlas Awards (2013)
- Editors' Citation for Excellence in Refereeing, Journal of Geophysical Research-Atmospheres (2013)
- Global Green Policy Design Award, Global Green (2013)

- Partial share of the 2007 Nobel Peace Prize as a research contributor and reviewer for IPCC, Norwegian Nobel Committee (2007)
- Editors' Citation for Excellence in Refereeing, Journal of Geophysical Research-Atmospheres (2005)
- Henry G. Houghton Award, American Meteorological Society (2005)
- New Investigator Award, NASA (1999-2002)
- Career Early Development Award, National Science Foundation (1995-1998)

## PROFESSIONAL EDUCATION

- PhD, University of California, Los Angeles , Atmospheric Sciences (1994)
- MS, University of California, Los Angeles , Atmospheric Sciences (1991)
- MS, Stanford University , Environmental Engineering (1988)
- BS, Stanford University , Civil Engineering (1988)
- BA, Stanford University , Economics (1988)

## LINKS

- <http://www.stanford.edu/group/efmh/jacobson/>: <http://www.stanford.edu/group/efmh/jacobson/>

## Teaching

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### COURSES

#### 2019-20

- 100% Clean, Renewable Energy and Storage for Everything: CEE 176B, CEE 276B (Spr)
- Air Pollution and Global Warming: History, Science, and Solutions: CEE 263D, CEE 64 (Win)
- Atmosphere/Energy Seminar: CEE 263S (Aut, Win, Spr)
- Weather and Storms: CEE 263C, CEE 63 (Aut)

#### 2018-19

- 100% Clean, Renewable Energy and Storage for Everything: CEE 176B, CEE 276B (Spr)
- Air Pollution and Global Warming: History, Science, and Solutions: CEE 263D, CEE 64 (Win)
- Atmosphere/Energy Seminar: CEE 263S (Aut, Win, Spr)
- Weather and Storms: CEE 263C, CEE 63 (Aut)

#### 2017-18

- Air Pollution Modeling: CEE 263A (Spr)
- Air Pollution and Global Warming: History, Science, and Solutions: CEE 263D, CEE 64 (Win)
- Atmosphere/Energy Seminar: CEE 263S (Aut, Win, Spr)
- Weather and Storms: CEE 263C, CEE 63 (Aut)

#### 2016-17

- Air Pollution and Global Warming: History, Science, and Solutions: CEE 263D, CEE 64 (Win)
- Atmosphere/Energy Seminar: CEE 263S (Aut, Win, Spr)
- Numerical Weather Prediction: CEE 263B (Spr)
- Weather and Storms: CEE 263C, CEE 63 (Aut)

## STANFORD ADVISEES

### Doctoral Dissertation Advisor (AC)

Scott Katalenich, Dan Sambor, Tim Yeskoo, Anna-Katharina von Krauland

**Master's Program Advisor**

Sara Borchers, Velvet Gaston, Catherine Hay, Richard Li, Shelby Parks, Ambroise Poulet--Tomasichio

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**Publications**

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**PUBLICATIONS**

- **How much wind power potential does Europe have? Examining European wind power potential with an enhanced socio-technical atlas (vol 132, pg 1092, 2019) *ENERGY POLICY***  
Enevoldsen, P., Permien, F., Bakhtaoui, I., von Krauland, A., Jacobson, M. Z., Xydis, G., Sovacool, B. K., Valentine, S. V., Luecht, D., Oxley, G.  
2020; 138
- **Optimal operational strategy for an offgrid hybrid hydrogen/electricity refueling station powered by solar photovoltaics *JOURNAL OF POWER SOURCES***  
Xu, X., Hu, W., Cao, D., Huang, Q., Liu, W., Jacobson, M. Z., Chen, Z.  
2020; 451: 227810
- **Co-optimized trading of hybrid wind power plant with retired EV batteries in energy and reserve markets under uncertainties *ELECTRICAL POWER AND ENERGY SYSTEMS***  
Zhan, S., Hou, P., Enevoldsen, P., Yang, G., Zhu, J., Eichman, J., Jacobson, M. Z.  
2020; 117: 105631
- **The health and climate impacts of carbon capture and direct air capture *ENERGY & ENVIRONMENTAL SCIENCE***  
Jacobson, M. Z.  
2019; 12 (12): 3567–74
- **How much wind power potential does europe have? Examining european wind power potential with an enhanced socio-technical atlas *ENERGY POLICY***  
Enevoldsen, P., Permien, F., Bakhtaoui, I., von Krauland, A., Jacobson, M. Z., Xydis, G., Sovacool, B. K., Valentine, S. V., Luecht, D., Oxley, G.  
2019; 132: 1092–1100
- **Short-Term Impacts of the Aliso Canyon Natural Gas Blowout on Weather, Climate, Air Quality, and Health in California and Los Angeles *ENVIRONMENTAL SCIENCE & TECHNOLOGY***  
Jacobson, M. Z.  
2019; 53 (10): 6081–93
- **Short-Term Impacts of the Megaurbanizations of New Delhi and Los Angeles Between 2000 and 2009 *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES***  
Jacobson, M. Z., Nghiem, S. V., Sorichetta, A.  
2019; 124 (1): 35–56
- **Impacts of Green New Deal energy plans on grid stability, costs, jobs, health, and climate in 143 countries *ONE EARTH***  
Jacobson, M. Z., Delucchi, M. A., Cameron, M. A., Coughlin, S. J., Hay, C., Manogaran, I. P., Shu, Y., von Krauland, A.  
2019; 1: 449-463
- **Carbon emissions and costs associated with subsidizing New York nuclear instead of replacing it with renewables *JOURNAL OF CLEANER PRODUCTION***  
Cebulla, F., Jacobson, M. Z.  
2018; 205: 884–94
- **100% clean and renewable Wind, Water, and Sunlight (WWS) all-sector energy roadmaps for 53 towns and cities in North America *SUSTAINABLE CITIES AND SOCIETY***  
Jacobson, M. Z., Cameron, M. A., Hennessy, E. M., Petkov, I., Meyer, C. B., Gambhira, T. K., Maki, A. T., Pflieger, K., Clonts, H., McEvoy, A. L., Miccioli, M. L., von Krauland, A., Fang, et al  
2018; 42: 22–37
- **Matching demand with supply at low cost in 139 countries among 20 world regions with 100% intermittent wind, water, and sunlight (WWS) for all purposes *RENEWABLE ENERGY***  
Jacobson, M. Z., Delucchi, M. A., Cameron, M. A., Mathiesen, B. V.  
2018; 123: 236–48

- **World estimates of PV optimal tilt angles and ratios of sunlight incident upon tilted and tracked PV panels relative to horizontal panels** *SOLAR ENERGY*  
Jacobson, M. Z., Jadhav, V.  
2018; 169: 55–66
- **Roadmaps to Transition Countries to 100% Clean, Renewable Energy for All Purposes to Curtail Global Warming, Air Pollution, and Energy Risk** *EARTHS FUTURE*  
Jacobson, M. Z.  
2017; 5 (10): 948–52
- **100% Clean and renewable wind, water, and sunlight all-sector energy roadmaps for 139 countries of the world** *JOULE*  
Jacobson, M. Z., Delucchi, M. A., Bauer, Z. A., Goodman, S. C., Chapman, W. E., Cameron, M. A., et al  
2017; 1 (1): 108-121
- **The United States can keep the grid stable at low cost with 100% clean, renewable energy in all sectors despite inaccurate claims.** *Proceedings of the National Academy of Sciences of the United States of America*  
Jacobson, M. Z., Delucchi, M. A., Cameron, M. A., Frew, B. A.  
2017; 114 (26): E5021–E5023
- **Optimizing investments in coupled offshore wind-electrolytic hydrogen storage systems in Denmark** *J. Power Sources*  
Hou, P., Enevoldsen, P., Eichman, J., Hu, W., Jacobson, M. Z., Chen, Z.  
2017; 359: 186-197
- **An intercomparative study of the effects of aircraft emissions on surface air quality** *JOURNAL OF GEOPHYSICAL RESEARCH: ATMOSPHERES*  
Cameron, M. A., Jacobson, M. Z., Barrett, S. R., Bian, H., Chen, C. C., Eastham, S. D., Gettelman, A., Khodayari, A., Liang, Q., Selkirk, H. B., Unger, N., Wuebbles, D. J., Yue, et al  
2017; 122 (15): 8325-8344
- **Temporal and spatial tradeoffs in power system modeling with assumptions about storage: An application of the POWER model** *ENERGY*  
Frew, B. A., Jacobson, M. Z.  
2016; 117: 198-213
- **Flexibility mechanisms and pathways to a highly renewable US electricity future** *ENERGY*  
Frew, B. A., Becker, S., Dvorak, M. J., Andresen, G. B., Jacobson, M. Z.  
2016; 101: 65-78
- **IMPACT OF AVIATION ON CLIMATE FAA's Aviation Climate Change Research Initiative (ACCRI) Phase II** *BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY*  
Brasseur, G. P., Gupta, M., Anderson, B. E., Balasubramanian, S., Barrett, S., Duda, D., Fleming, G., Forster, P. M., Fuglestedt, J., Gettelman, A., Halthore, R. N., Jacob, S. D., Jacobson, et al  
2016; 97 (4): 561-583
- **A 100% wind, water, sunlight (WWS) all-sector energy plan for Washington State** *RENEWABLE ENERGY*  
Jacobson, M. Z., Delucchi, M. A., Bazouin, G., Dvorak, M. J., Arghandeh, R., Bauer, Z. A., Cotte, A., de Moor, G. M., Goldner, E. G., Heier, C., Holmes, R. T., Hughes, S. A., Jin, et al  
2016; 86: 75-88
- **Reply to Bistline and Blanford: Letter reaffirms conclusions and highlights flaws in previous research.** *Proceedings of the National Academy of Sciences of the United States of America*  
Jacobson, M. Z., Delucchi, M. A., Cameron, M. A., Frew, B. A.  
2016; 113 (28): E3989–90
- **Low-cost solution to the grid reliability problem with 100% penetration of intermittent wind, water, and solar for all purposes** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Jacobson, M. Z., Delucchi, M. A., Cameron, M. A., Frew, B. A.  
2015; 112 (49): 15060-15065
- **Comparison of low-carbon pathways for California** *CLIMATIC CHANGE*  
Morrison, G. M., Yeh, S., Eggert, A. R., Yang, C., Nelson, J. H., Greenblatt, J. B., Isaac, R., Jacobson, M. Z., Johnston, J., Kammen, D. M., Mileva, A., Moore, J., Roland-Holst, et al  
2015; 131 (4): 545-557

- **Ring of impact from the mega-urbanization of Beijing between 2000 and 2009** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Jacobson, M. Z., Nghiem, S. V., Sorichetta, A., Whitney, N.  
2015; 120 (12): 5740-5756
- **Ocean Acidification Science Needs for Natural Resource Managers of the North American West Coast** *OCEANOGRAPHY*  
Boehm, A. B., Jacobson, M. Z., O'Donnell, M. J., Sutula, M., Wakefield, W. W., Weisberg, S. B., Whiteman, E.  
2015; 28 (2): 170-181
- **Renewable build-up pathways for the US: Generation costs are not system costs** *ENERGY*  
Becker, S., Frew, B. A., Andresen, G. B., Jacobson, M. Z., Schramm, S., Greiner, M.  
2015; 81: 437-445
- **100% clean and renewable wind, water, and sunlight (WWS) all-sector energy roadmaps for the 50 United States** *ENERGY & ENVIRONMENTAL SCIENCE*  
Jacobson, M. Z., Delucchi, M. A., Bazouin, G., Bauer, Z. A., Heavey, C. C., Fisher, E., Morris, S. B., Piekutowski, D. J., Vencill, T. A., Yeskoo, T. W.  
2015; 8 (7): 2093-2117
- **Variability and uncertainty of wind power in the California electric power system** *WIND ENERGY*  
Stoutenburg, E. D., Jenkins, N., Jacobson, M. Z.  
2014; 17 (9): 1411-1424
- **A roadmap for repowering California for all purposes with wind, water, and sunlight** *ENERGY*  
Jacobson, M. Z., Delucchi, M. A., Ingraffea, A. R., Howarth, R. W., Bazouin, G., Bridgeland, B., Burkart, K., Chang, M., Chowdhury, N., Cook, R., Escher, G., Galka, M., Han, et al  
2014; 73: 875-889
- **Features of a fully renewable US electricity system: Optimized mixes of wind and solar PV and transmission grid extensions** *ENERGY*  
Becker, S., Frew, B. A., Andresen, G. B., Zeyer, T., Schramm, S., Greiner, M., Jacobson, M. Z.  
2014; 72: 443-458
- **Effects of biomass burning on climate, accounting for heat and moisture fluxes, black and brown carbon, and cloud absorption effects** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Jacobson, M. Z.  
2014; 119 (14): 8980-9002
- **Taming hurricanes with arrays of offshore wind turbines** *NATURE CLIMATE CHANGE*  
Jacobson, M. Z., Archer, C. L., Kempton, A.  
2014; 4 (3): 195-200
- **Comparison of model estimates of the effects of aviation emissions on atmospheric ozone and methane** *J. Geophys. Res.*  
Olsen, S. C., Brasseur, G. P., Wuebbles, D. J., Barrett, S., R.H., Dang, H., Eastham, S., D., Jacobson, M. Z.  
2014; 40: 6004-6009
- **Effects of plume versus grid-scale treatment of aircraft exhaust photochemistry** *Geophys. Res. Lett.*  
Cameron, M., A., Jacobson, M., Z., Naiman, A., D., Lele, S., K.  
2014; 40: 5815-5820
- **Geographical and seasonal variability of the global "practical" wind resources** *APPLIED GEOGRAPHY*  
Archer, C. L., Jacobson, M. Z.  
2013; 45: 119-130
- **Comparison of model estimates of the effects of aviation emissions on atmospheric ozone and methane** *GEOPHYSICAL RESEARCH LETTERS*  
Olsen, S. C., Brasseur, G. P., Wuebbles, D. J., Barrett, S. R., Dang, H., Eastham, S. D., Jacobson, M. Z., Khodayari, A., Selkirk, H., Sokolov, A., Unger, N.  
2013; 40 (22): 6004-6009
- **Effects of plume-scale versus grid-scale treatment of aircraft exhaust photochemistry** *GEOPHYSICAL RESEARCH LETTERS*  
Cameron, M. A., Jacobson, M. Z., Naiman, A. D., Lele, S. K.  
2013; 40 (21): 5815-5820
- **Response to comment on paper examining the feasibility of changing New York state's energy infrastructure to one derived from wind, water, and sunlight** *ENERGY POLICY*

- Jacobson, M. Z., Howarth, R. W., Delucchi, M. A., Scobie, S. R., Barth, J. M., Dvorak, M. J., Klevze, M., Katkhuda, H., Miranda, B., Chowdhury, N. A., Jones, R., Plano, L., Ingrassia, et al  
2013; 62: 1212-1215
- **US East Coast offshore wind energy resources and their relationship to peak-time electricity demand** *WIND ENERGY*  
Dvorak, M. J., Corcoran, B. A., Ten Hoeve, J. E., McIntyre, N. G., Jacobson, M. Z.  
2013; 16 (7): 977-997
  - **Meeting the world's energy needs entirely with wind, water, and solar power** *BULLETIN OF THE ATOMIC SCIENTISTS*  
Delucchi, M. A., Jacobson, M. Z.  
2013; 69 (4): 30-40
  - **Bounding the role of black carbon in the climate system: A scientific assessment** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Bond, T. C., Doherty, S. J., Fahey, D. W., Forster, P. M., Berntsen, T., DeAngelo, B. J., Flanner, M. G., Ghan, S., Kaercher, B., Koch, D., Kinne, S., Kondo, Y., Quinn, et al  
2013; 118 (11): 5380-5552
  - **Response to Trainer's second commentary on a plan to power the world with wind, water, and solar power** *ENERGY POLICY*  
Jacobson, M. Z., Delucchi, M. A.  
2013; 57: 641-643
  - **Examining the feasibility of converting New York State's all-purpose energy infrastructure to one using wind, water, and sunlight** *ENERGY POLICY*  
Jacobson, M. Z., Howarth, R. W., Delucchi, M. A., Scobie, S. R., Barth, J. M., Dvorak, M. J., Klevze, M., Katkhuda, H., Miranda, B., Chowdhury, N. A., Jones, R., Plano, L., Ingrassia, et al  
2013; 57: 585-601
  - **Comment on "Radiative Absorption Enhancements Due to the Mixing State of Atmospheric Black Carbon"** *SCIENCE*  
Jacobson, M. Z.  
2013; 339 (6118)
  - **Measuring and modeling the hygroscopic growth of two humic substances in mixed aerosol particles of atmospheric relevance** *ATMOSPHERIC CHEMISTRY AND PHYSICS*  
Zamora, I. R., Jacobson, M. Z.  
2013; 13 (17): 8973-8989
  - **The effects of aircraft on climate and pollution. Part II: 20-year impacts of exhaust from all commercial aircraft worldwide treated individually at the subgrid scale.** *Faraday discussions*  
Jacobson, M. Z., Wilkerson, J. T., Naiman, A. D., Lele, S. K.  
2013; 165: 369-382
  - **Roadmaps for powering the world, U.S., and individual states for all purposes with wind, water, and sunlight, U015.**  
Jacobson, M., Z.  
2013
  - **Effects of aviation on global climate, Aviation Emissions Characterization Roadmap**  
Jacobson, M., Z.  
2013
  - **Taming hurricanes with arrays of offshore wind turbines**  
Jacobson, M., Z.  
2013
  - **The effects of aircraft on climate and pollution. Part II: 20-year impacts of exhaust from all commercial aircraft worldwide treated individually at the subgrid scale** *Faraday Discussions*  
Jacobson, M., Z., Wilkerson, J., T., Naiman, A., D., Lele, S., K.  
2013
  - **Powering individual states, countries, and the world with WWS**  
Jacobson, M., Z.  
2013

- **Powering the world, the U.S., and individual states with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **Carbon dioxide domes, effects of cross-polar flights, and taming hurricanes with offshore wind**  
Jacobson, M., Z.  
2013
- **Examining the feasibility of converting New York State's all-purpose energy infrastructure to one using wind, water, and sunlight** *Energy Policy*  
Jacobson, M., Z., Howarth, R., W., Delucchi, M., A., Scobies, S., R., Barth, J., M., Dvorak, M., J.  
2013; 57: 585-601
- **Assessing the impact of aviation on climate**  
Jacobson, M., Z.  
2013
- **Powering New York State with Wind**  
Jacobson, M., Z.  
2013
- **The Future of Energy**  
Jacobson, M., Z.  
2013
- **Powering the states, the U.S., and world for all purposes with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **The natural gas goldrush and the future of renewables**  
Jacobson, M., Z.  
2013
- **Roadmaps for powering the world, U.S., and individual states for all purposes with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **Powering individual states and the world with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **Effects of aviation on surface air quality**  
Jacobson, M., Z.  
2013
- **Interview**  
Jacobson, M., Z.  
2013
- **Roadmaps to power California and the world with wind, water, and the sun**  
Jacobson, M., Z.  
2013
- **A plan to power the world for all purposes with wind, water, and the sun**  
Jacobson, M., Z.  
2013
- **Powering the world, U.S., and individual states for all purposes with wind, water, and sun**  
Jacobson, M., Z.  
2013

- **Powering the world, U.S. and individual states for all purpose with wind**  
Jacobson, M., Z.  
2013
- **Powering individual states, the U.S., and the world with wind water, and sunlight**  
Jacobson, M., Z.  
2013
- **Clean energy plans for the U.S. and individual states**  
Jacobson, M., Z.  
2013
- **Bounding the role of black carbon in the climate system: A scientific assessment** *J. Geophys. Res.*  
Bond, T., C., Doherty, S., J., Fahey, D., W., Forster, P., M., Berntsen, T., Boucher, O., Jacobson, M. Z.  
2013
- **Geographical and seasonal variability of the global “practical” wind resources** *Applied Geography*  
Archer, C., L., Jacobson, M., Z.  
2013; 45: 119-130
- **Powering states and the U.S. with wind, water, and sunlight, California Democratic Party Executive Board Meeting**  
Jacobson, M., Z.  
2013
- **Powering New York with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **Taming hurricanes with arrays of offshore wind turbines that simultaneously reduce global warming and air pollution and provide normal electric power**  
Jacobson, M., Z.  
2013
- **Acceptance speech**  
Jacobson, M., Z.  
2013
- **Roadmaps for powering California, the U.S., and the world for all purposes with wind, water, and sunlight**  
Jacobson, M., Z.  
2013
- **The effects of aircraft on climate and pollution**  
Jacobson, M., Z.  
2013
- **The effects of aircraft on climate and pollution. Part II: 20-year impacts of exhaust from all commercial aircraft worldwide treated individually at the subgrid scale** *FARADAY DISCUSSIONS*  
Jacobson, M. Z., Wilkerson, J. T., Naiman, A. D., Lele, S. K.  
2013; 165: 369-382
- **Coupling of highly explicit gas and aqueous chemistry mechanisms for use in 3-D ATMOSPHERIC ENVIRONMENT**  
Ginnebaugh, D. L., Jacobson, M. Z.  
2012; 62: 408-415
- **Expected Body Weight in Adolescents: Comparison Between Weight-for-Stature and BMI Methods** *PEDIATRICS*  
Golden, N. H., Yang, W., Jacobson, M. S., Robinson, T. N., Shaw, G. M.  
2012; 130 (6): E1607-E1613
- **The effects of rerouting aircraft around the arctic circle on arctic and global climate** *CLIMATIC CHANGE*  
Jacobson, M. Z., Wilkerson, J. T., Balasubramanian, S., Cooper, W. W., Mohleji, N.  
2012; 115 (3-4): 709-724



- **Examining the impacts of ethanol (E85) versus gasoline photochemical production of smog in a fog using near-explicit gas- and aqueous-chemistry mechanisms** *ENVIRONMENTAL RESEARCH LETTERS*  
Ginnebaugh, D. L., Jacobson, M. Z.  
2012; 7 (4)
- **Saturation wind power potential and its implications for wind energy** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Jacobson, M. Z., Archer, C. L.  
2012; 109 (39): 15679-15684
- **Worldwide health effects of the Fukushima Daiichi nuclear accident** *ENERGY & ENVIRONMENTAL SCIENCE*  
Ten Hoeve, J. E., Jacobson, M. Z.  
2012; 5 (9): 8743-8757
- **Reply to the 'Opinion on "Worldwide health effects of the Fukushima Daiichi nuclear accident"' by B. Richter, Energy Environ. Sci., 2012, 5, DOI: 10.1039/c2ee22658h"** *ENERGY & ENVIRONMENTAL SCIENCE*  
Ten Hoeve, J. E., Jacobson, M. Z.  
2012; 5 (9): 8760-8760
- **Effects of aggregating electric load in the United States** *ENERGY POLICY*  
Corcoran, B. A., Jenkins, N., Jacobson, M. Z.  
2012; 46: 399-416
- **Importance of composition and hygroscopicity of BC particles to the effect of BC mitigation on cloud properties: Application to California conditions** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Bahadur, R., Russell, L. M., Jacobson, M. Z., Prather, K., Nenes, A., Adams, P., Seinfeld, J. H.  
2012; 117
- **Response to "A critique of Jacobson and Delucchi's proposals for a world renewable energy supply" by Ted Trainer** *ENERGY POLICY*  
Delucchi, M. A., Jacobson, M. Z.  
2012; 44: 482-484
- **The carbon abatement potential of high penetration intermittent renewables** *ENERGY & ENVIRONMENTAL SCIENCE*  
Hart, E. K., Jacobson, M. Z.  
2012; 5 (5): 6592-6601
- **Comparing results from a physical model with satellite and in situ observations to determine whether biomass burning aerosols over the Amazon brighten or burn off clouds** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Ten Hoeve, J. E., Jacobson, M. Z., Remer, L. A.  
2012; 117
- **Recent shift from forest to savanna burning in the Amazon Basin observed by satellite** *ENVIRONMENTAL RESEARCH LETTERS*  
Ten Hoeve, J. E., Remer, L. A., Correia, A. L., Jacobson, M. Z.  
2012; 7 (2)
- **Investigating cloud absorption effects: Global absorption properties of black carbon, tar balls, and soil dust in clouds and aerosols** *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*  
Jacobson, M. Z.  
2012; 117
- **Where is the ideal location for a US East Coast offshore grid?** *GEOPHYSICAL RESEARCH LETTERS*  
Dvorak, M. J., Stoutenburg, E. D., Archer, C. L., Kempton, W., Jacobson, M. Z.  
2012; 39
- **Effects of Urban Surfaces and White Roofs on Global and Regional Climate** *JOURNAL OF CLIMATE*  
Jacobson, M. Z., Ten Hoeve, J. E.  
2012; 25 (3): 1028-1044
- **The Potential of Intermittent Renewables to Meet Electric Power Demand: Current Methods and Emerging Analytical Techniques** *PROCEEDINGS OF THE IEEE*  
Hart, E. K., Stoutenburg, E. D., Jacobson, M. Z.

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2012; 100 (2): 322-334

- **The case for a fully renewable, all-purpose energy system**  
Jacobson, M., Z.  
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2012
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2010
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Jacobson, M., Z.  
2010
- **Assessing the impact of aviation on climate, FAA/PARTNER Meeting**  
Jacobson, M., Z.  
2010
- **Effects of black carbon and CO2 domes on climate and air quality**  
Jacobson, M., Z.  
2010
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Jacobson, M., Z.  
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