

MARC W. MELAINA

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EDUCATION

University of Michigan, Ann Arbor, Michigan, 1997-2005

Ph.D. in Natural Resources and Environment, December 2005.

Track: Resource Policy and Behavior

Dissertation: Initiating hydrogen infrastructures: analysis of technology dynamics during the introduction of hydrogen fuel for passenger vehicles.

Committee: Thomas Gladwin (co-chair), Greg Keoleian (co-chair), Marc Ross, Rosina Bierbaum, Jonathan Bulkley.

M.S.E. Civil and Environmental Engineering, April 2002.

M.S. Natural Resources and Environment: Sustainable Systems, December 2007 (expected).

University of Utah, Salt Lake City, Utah, 1990-1996

B.A. Physics, April 1996.

RESEARCH EXPERIENCE

Project Scientist, Institute of Transportation Studies, U.C. Davis, 2005 to present.

Collaboration with an interdisciplinary team of researchers directed by Drs. Daniel Sperling and Joan Ogden. Research on hydrogen infrastructure, policy and business strategy.

Doctoral Research, Natural Resources and Environment, University of Michigan, 2000-2005. Combined engineering, economic, policy and historical analyses to articulate a scenario for rapid hydrogen infrastructure development.

Student Internship, Oakridge National Laboratory, U.S. Department of Energy, National Transportation Research Center, Summer 2004. Research to support hydrogen infrastructure modeling with David Greene and Paul Leiby.

Research Assistant, Center for Sustainable Systems, University of Michigan, 1999-2003. Curriculum development for a graduate course in hydrogen energy (Winter 2003). Hydrogen infrastructure and life cycle modeling (Winter 1999 and Winter 2002).

TEACHING EXPERIENCE

Principle Instructor, Transportation Energy Analysis and Modeling, UC Davis, Spring 2007. Designed course and will co-teach with Dr. Mark Delucchi. Graduate-level course.

Graduate Student Instructor, Energy and the Environment, Residential College, University of Michigan, 1999-2003. Designed course and was primary instructor for five semesters.

WORK EXPERIENCE

Consultant, Argonne National Laboratory, U.S. Department of Energy, 2003 to present.
Researched hydrogen and renewable energy with Dr. Don Hanson and John “Skip” Laitner.

Consultant, Defense Logistics Agency, Department of Defense, March 2005 to July 2005.
Conducted technology characterization and facility location analysis for hydrogen infrastructure systems. Contract through San Diego State University’s Research Foundation.

Consultant, Industrial Economics, Incorporated (IEc), Cambridge, Massachusetts, May 2003.
Addressed recycling issues for fuel cell and hydrogen technologies.

Assistant to the Energy Coordinator, City of Ann Arbor Energy Office, 1999 to 2003.
Maintained city energy records, conducted technical analysis for the Climate Change Action Plan, wrote grants and developed outreach materials the Ann Arbor Clean Cities Coalition.

JOURNAL ARTICLES

Melaina, M.W., 2007. Turn of the century refueling: A review of innovations in early gasoline refueling methods and analogies for hydrogen. *Energy Policy* (in press).

Zhao, J., **Melaina, M.W.**, 2006. Transition to hydrogen-based transportation in China: Lessons learning from alternative fuel vehicle programs in the United States and China. *Energy Policy* 34(11): 1299-1309.

Melaina, M.W., 2003. Initiating hydrogen infrastructures: preliminary analysis of a sufficient number of initial hydrogen stations in the U.S. *International Journal of Hydrogen Energy* 28(7): 743-755.

Björklund, A., **Melaina, M.W.**, Keoleian, G., 2001. Hydrogen as a transportation fuel produced from thermal gasification of municipal solid waste: an examination of two integrated technologies. *International Journal of Hydrogen Energy* 26(11): 1209-1221.

Melaina, M.W. (Jensen), Ross, M.H., 2000. The ultimate challenge: developing an infrastructure for fuel cell vehicles. *Environment* 42, 10-22.

CONFERENCE PROCEEDINGS

Melaina, M.W., Ogden, J.M., Miller, M., Nicholas, M., 2007. Simulating a Hydrogen Infrastructure Rollout in Los Angeles, California. 18th Annual Meeting of the National Hydrogen Association. March 19-22, 2007. San Antonio, Texas (abstract accepted).

Melaina, M.W., Bremson, J., 2006. Regularities in early hydrogen station size distributions. *Energy in a World of Changing Costs and Technologies*, 26th North American Conference, International Association of Energy Economics. Ann Arbor, Michigan, September 24-27.

Melaina, M.W., 2005. Estimating relative station sizes in early hydrogen station networks. 16th Annual Conference of the National Hydrogen Association Annual. Washington, D.C., March 29 - April 1.

Melaina, M.W., 2004. Addressing the chicken and egg problem: modeling network-level transitions between modes of hydrogen delivery. The International Hydrogen Energy Forum. Beijing, China, May 25-28.

Melaina, M.W., 2004. Turn of the century refueling: lessons from the past for introducing hydrogen fuel for 21st century vehicles. 15th Annual U.S. Hydrogen Conference and Exposition of the National Hydrogen Association. Hollywood, CA, April 26-30.

Zhao, J., **Melaina, M.W.**, 2003. Transition to hydrogen-based transportation: lessons learned from alternative fuel vehicles in the United States and China. Sustainable Multi-Modal Transportation for Chinese Cities. Shanghai, China, October 20-21.

Melaina, M.W., 2003. Initiating hydrogen infrastructures: the role of the chicken and egg problem in increasing energy security and reducing greenhouse gas emissions in the U.S. 14th Annual U.S. Hydrogen Conference and Exposition of the National Hydrogen Association. Washington, D.C, March 4-6.

Melaina, M.W., Keoleian, G., 2001. Urban energy metabolism: framework and case study. Inaugural Meeting of the International Society for Industrial Ecology: The Science & Culture of Industrial Ecology. Leiden, The Netherlands, November 12-14.

Melaina, M.W., Keoleian, G., 2001. A framework for urban energy metabolism studies: an Ann Arbor, Michigan case study. The Alliance for Regional Resource Management (ARM) Workshop. Zurich, Switzerland, August 28-30.

BOOK REVIEWS

Melaina, M.W., Yang, C., Review of the book *The Hype about Hydrogen: Fact and Fiction in the Race to Save the Planet*, by Joseph J. Romm, Island Press, Washington D.C., 2005. *Journal of Ecological Economics* 63(1): 244-245.

REPORTS

Arons, S.M., A.R. Brandt, M.A. Delucchi, A. Eggert, A.E. Farrell, B.K. Haya, J. Hughes, B.M. Jenkins, A.D. Jones, D.M. Kammen, S.R. Kaffka, C.R. Knittel, D.M. Lemoine, E.W. Martin, **M.W. Melaina**, J.M. Ogden, R.J. Plevin, D. Sperling, B.T. Turner, R.B. Williams, C. Yang, 2007. A Low-Carbon Fuel Standard for California, Part 1: Technical Analysis. Available Online: <http://www.lcfs.ucdavis.edu>.

Brandt, A.R., A.E. Farrell, B.K. Haya, J. Hughes, B.M. Jenkins, A.D. Jones, D.M. Kammen, C.R. Knittel, **M.W. Melaina**, M. O'Hare, R.J. Plevin, D. Sperling, 2007. A Low-Carbon Fuel Standard for California, Part 2: Policy Analysis. Available Online: <http://www.lcfs.ucdavis.edu>.

Lutsey, N., Regnier, J., Burke, A., **Melaina, M.W.**, Bremson, J., Keteltas, M., 2006. Assessment of Tire Technologies and Practices for Potential Waste and Energy Use Reductions. Prepared by the Institute of Transportation Studies, University of California Davis, for the California Integrated Waste Management Board, Sacramento, CA. Prepared under contract IWM-03079.

FORMAL PRESENTATIONS

Melaina, M.W. Alternative Fuels and the California Low Carbon Fuel Standard. 6th Annual UC/CSU/CCC Sustainability 2007 Conference. UC Santa Barbara, June 24-27, 2007.

Melaina, M.W. California's Low Carbon Fuel Standard. California Fuel Cell Partnership, Sacramento, California. April 10th, 2007.

Melaina, M.W. Regional Hydrogen Transition Modeling: Lessons from the Hydrogen Pathways Program. IEA/IPHE Workshop on Building the Hydrogen Economy: Enabling Infrastructure Development, Detroit, Michigan. April 2-4, 2007.

Melaina, M.W. California's low carbon fuel standard and implications for biofuel development. California Biomass Collaborative, Fourth Annual Forum, Sacramento, California. March 27-29, 2007.

Melaina, M.W. State climate change policy: California's low carbon fuel standard. SoCalGas Customer Appreciation Dinner. Visalia, California. February 13th, 2007.

Melaina, M.W. Early hydrogen infrastructure development and the coordination of stakeholder decisions, January 17, 2006. Institute of Transportation Studies Seminar Series, University of California at Davis.

Melaina, M.W. Initiating early hydrogen infrastructures. 6th National Conference on Science, Policy and the Environment. Washington, D.C., January 26-27, 2006 (poster).

Melaina, M.W. Life cycle energy use and greenhouse gas emissions from passenger vehicles. Society of Automotive Engineers World Congress. 8-11 March, 2004, Detroit, Michigan.

Melaina, M.W. Life cycle energy of a future fuel cell vehicle. Industrial Ecology for a Sustainable Future. International Society of Industrial Ecology Second International Conference, University of Michigan, Ann Arbor, Michigan. June 29 – July 2, 2003.

Melaina, M.W. Initiating hydrogen infrastructures. 14th World Hydrogen Energy Conference: The Hydrogen Planet. Montreal, Quebec, Canada. June 9-13, 2002 (poster).

Melaina, M.W. Initiating hydrogen infrastructures: preliminary estimates of a sufficient number of hydrogen stations in the U.S. Market Challenges of Fuel Cell Commercialisation. Fuel Cell and Hydrogen Research Center, Berlin, Germany. September 12-13, 2002 (Proceedings published in the International Journal of Hydrogen Energy, June 2003).

Melaina, M.W., Keoleian, G. Municipal energy metabolisms: an Ann Arbor case study. The Science & Culture of Industrial Ecology. International Society of Industrial Ecology Inaugural Meeting. Leiden, The Netherlands. November 12-14, 2001.

Melaina, M.W., Keoleian, G. Municipal energy metabolisms: an Ann Arbor case study. Alliance for Regional Resource Management: Workshop '01. Swiss Federal Institute of Technology, Zurich, Switzerland. August 28-30, 2001.

Björklund, A., Melaina, M.W., Keoleian, G. Hydrogen as a transportation fuel produced from thermal gasification of municipal solid waste: an examination of two integrated technologies. University of Michigan, International Workshop on Environmental Systems Analysis, November 19-20, 1999 (poster).

EVENTS ORGANIZED

University of Michigan Interdepartmental Fuel Cell Technology Meeting. December 2000. Included presentations on current research on the U of M campus related to fuel cell technology.

Fuel Cells for Motor Vehicles Seminar Series. University of Michigan, sponsored by the Department of Physics and College of Engineering. Fall 1998 and winter 1999. Speakers included Dr. Margaret Steinbugler (United Technologies, International Fuel Cells), Dr. Joan Ogden (Princeton University), James Adams (Ford) and Moshen Shabana (GM).

COMPUTER SKILLS

Proficiency with: Excel, Word, Power Point, VISIO, STELLA, Crystal Ball, MapPoint.

ACADEMIC SERVICE

Research Thread Leader, Scenarios and Case Studies Thread within the Sustainable Transportation Energy Pathways program (STEPS), Institute of Transportation Studies, UC Davis, January 2007 to present.

Research Track Director, Policy and Business Strategy Track, Hydrogen Pathways Program, Institute of Transportation Studies, UC Davis, 10/05 to 12/06.

Research Proposal Reviews, Department of Energy graduate student GATE Fellowship Program, University of California, Davis, 2006; Netherlands Organization for Scientific Research, Advanced Catalytic Technologies for Sustainability: Sustainable Hydrogen Program, 2005.

Journal Article Reviews (since 2005), International Journal of Hydrogen Energy (3 articles); Energy Policy (2 articles), European Journal of Operational Research (1 article).

PROFESSIONAL AFFILIATIONS

- Society of Automotive Engineers (SAE)
- International Society for Industrial Ecology (ISIE)
- International Association for Energy Economics (IAEE)
- American Society for Engineering Education (ASEE)

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