

2008 ACHIEVEMENTS: PUBLICATIONS, EVENTS and AWARDS**Sustainable Transportation Energy Pathways Program**

Institute of Transportation Studies
University of California, Davis
January 2009

In 2008, STEPS researchers produced over 50 articles, research reports and major publications. In addition, this year saw the successful completion of one STEPS sponsor event and two policymaker outreach events in Sacramento and Davis. The program publications, events and awards are summarized below.

Please visit the STEPS website (<http://www.steps.its.ucdavis.edu>) for copies of selected publications and the 2007 STEPS Achievements document.

PUBLICATIONS**Books and Chapters in Books**

Delucchi, Mark A. 2008. The social cost of motor-vehicle use in the U. S. in environmentally conscious transportation. In *Environmentally Conscious Transportation*, 57–96. Hoboken, NJ: Wiley.

Ogden, Joan et al. 2008. *Transitions to Alternative Transportation Technologies: A Focus on Hydrogen*. National Academies of Engineering.

Sperling, Dan, and James Cannon. 2009. *Reducing Climate Impacts in the Transportation Sector*. Springer.

Sperling, Dan, and Deborah Gordon. 2009. *Two Billion Cars: Driving Toward Sustainability*. New York: Oxford University Press.

Journal Publications

Borenstein, Severin, James Bushnell, Christopher Knittel, and Catherine Wolfram. 2008. Inefficiencies and market power in financial arbitrage: A study of California's electricity markets. *The Journal of Industrial Economics* 2:347–378.

Delucchi, Mark A. and James J. Murphy. 2008. How large are tax subsidies to motor-vehicle users in the U.S.? *Transport Policy* 15:196–208.

Delucchi, Mark A. and James J. Murphy. 2008. U.S. military expenditures to protect the use of Persian Gulf oil for motor vehicles. *Energy Policy* 36:2253–2264.

Heffner, Reid R., Kenneth S. Kurani, and Thomas S. Turrentine. 2008. Symbolism in California's early market for hybrid electric vehicles. *Transportation Research Part D: Transport and Environment* 12:396–413.

Huang, Yongxi, Yueyue Fan, and Ruey Long Cheu. 2008. Optimal allocation of multiple emergency service resources for protection of critical transportation infrastructure. *Transportation Research Record* 2022:1–8.

Hughes, Jonathan E., Christopher R. Knittel, and Daniel Sperling. 2008. Evidence of a shift in the short-run price elasticity of gasoline demand. *Energy Journal* 29(1): 113–134.

Johnson, Nils A., Christopher Yang, and Joan Ogden. 2008. A GIS-based assessment of coal-based hydrogen infrastructure deployment in the state of Ohio. *International Journal of Hydrogen Energy* 33:5287–5303.

Knittel, Christopher and Konstantinos Metaxoglou. 2008. Diagnosing unilateral market power in electricity reserves market. *Journal of Energy Markets* 1(1).

Lin, Zhenhong, Chien-Wei Chen, Joan Ogden, and Yueyue Fan. 2008. The least-cost hydrogen for Southern California. *International Journal of Hydrogen Energy* 33:3009–3014.

Lin, Zhenhong, Joan Ogden, Yueyue Fan, and Chien-Wei Chen. 2008. The fuel-travel-back approach to hydrogen station siting. *International Journal of Hydrogen Energy* 33:3096–3101.

Lutsey, Nicholas P. and Daniel Sperling. 2008. America's bottom-up climate change mitigation policy. *Energy Policy* 36:673–685.

Lutsey, Nicholas P. and Daniel Sperling. 2008. Transportation and greenhouse gas mitigation. *Climate Action, United Nations Environmental Program* 1:191–194.

McCarthy, Ryan W., Joan M. Ogden, and Daniel Sperling. 2008. Assessing reliability in energy supply systems. *Energy Policy* 35:2151–2162.

McCollum, David and Joan Ogden. 2008. Future impacts of coal distribution constraints on coal cost. *Transportation Research Part E: Logistics and Transportation Review*, In Press.

Melaina, Marc W. and Joel Bremson. 2008. Refueling availability for alternative fuel vehicle markets: Sufficient urban station coverage. *Energy Policy* 36:3223–3231.

Parker, Nathan, Joan Ogden, and Yueyue Fan. 2008. The role of biomass in California's hydrogen economy. *Energy Policy* 36:3925–3939.

Sperling, Daniel and Deborah Gordon. 2008. Advanced passenger transport technologies. *Annual Review of Environment and Resources* 33:63–84.

Turrentine, Thomas S., Kenneth S. Kurani, and Reid R. Heffner. 2008. Fuel economy: What drives consumer choice? *Access Magazine* 31:14–19.

Wang, Guihua, Joan Ogden, and Daniel Sperling. 2008. Comparing air quality impacts of hydrogen and gasoline. *Transportation Research Part D: Transport and Environment* 13:436–448.

Wang, Guihua, Song Bai, and Joan Ogden. 2008. Identifying contributions of on-road motor vehicles to urban air pollution using travel demand model data. *Transportation Research Part D: Transport and Environment*. In Press.

Weinert, Jonathan, Joan Ogden, Dan Sperling, and Andrew Burke. 2008. The future of electric two-wheelers and electric vehicles in China. *Energy Policy* 36:2544–2555.

Yang, Christopher. 2008. Hydrogen and electricity: Parallels, interactions, and convergence. *International Journal of Hydrogen Energy* 33:1977–1994.

Yang, Christopher, David McCollum, Ryan McCarthy, and Wayne Leighty. 2008. Meeting an 80% reduction in greenhouse gas emissions from transportation by 2050: A case study in California, USA. *Transportation Research Part D: Transport and Environment*. In Press.

Yeh, Sonia, Alex Farrell, Richard Plevin, Alan Sanstad, and John Weyant. 2008. Optimizing U.S. mitigation strategies for the light-duty transportation sector: What we learn from a bottom-up model. *Environmental Science and Technology* 42:8202–8210.

Conference Papers and Technical Reports

Axsen, Jonn, Andrew F. Burke, and Kenneth S. Kurani. 2008. Batteries for plug-in hybrid electric vehicles (PHEVs): Goals and the state of technology circa 2008. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-14.

Axsen, Jonn and Kenneth S. Kurani. 2008. The early U.S. market for PHEVs: Anticipating consumer awareness, recharge potential, design priorities and energy impacts. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-22.

Bremson, Joel. 2008. A serious game for the illumination of alternative fuel and vehicle transitions. AAAI 2009 Symposium on Technosocial Predictive Analytics Proceedings.

Collantes, Gustavo O. 2008. The dimensions of the policy debate over transportation energy: The case of hydrogen in the United States. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-05.

Cunningham, Joshua M., Sig Gronich, and Michael A. Nicholas. 2008. Why hydrogen and fuel cells are needed to support California climate policy. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-06.

Delucchi, Mark A. 2008. The cost of protecting oil in the Persian Gulf. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-07-31.

Holland, Stephen P., Christopher R. Knittel, and Jonathan E. Hughes. 2008. Greenhouse gas reductions under low carbon fuel standards? Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-01.

Kammen, Daniel M., Alexander E. Farrell, Richard J. Plevin, Andrew D. Jones, Gregory F. Nemet, and Mark A. Delucchi. 2008. Energy and greenhouse gas impacts of biofuels: A framework for analysis. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-04.

Kurani, Kenneth S., Reid R. Heffner, and Thomas S. Turrentine. 2008. Driving plug-in hybrid electric vehicles: Reports from U.S. drivers of HEVs converted to PHEVs, circa 2006-07. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-24.

Leighty, Wayne. 2008. Modeling of energy production decisions: An Alaska oil case study. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-26.

Lin, C.-Y. Cynthia. 2008. Estimating and testing a dynamic model of OPEC and non-OPEC. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-07-28.

Lutsey, Nicholas P. 2008. Prioritizing climate change mitigation alternatives: Comparing transportation technologies to options in other sectors. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-15.

Lutsey, Nicholas P. 2008. Assessment of out-of-state heavy-duty truck activity trends in California. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-16.

McCarthy, Ryan W., Christopher Yang, and Joan M. Ogden. 2008. California baseline energy demands to 2050 for advanced energy pathways. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-07.

McCarthy, Ryan W., Christopher Yang, and Joan M. Ogden. 2008. California energy demand scenario projections to 2050. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-11.

McCarthy, Ryan W., Christopher Yang, and Joan M. Ogden. 2008. Assessing strategies for fuel and electricity production in a California hydrogen economy. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RP-08-13.

McCarthy, Ryan W., Christopher Yang, and Joan M. Ogden. 2008. Emissions impacts of marginal electricity demand on California hydrogen supply pathways. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RP-08-14.

McCarthy, Ryan W., Christopher Yang, and Joan M. Ogden. 2008. Impacts of electric-drive vehicles on California's energy system. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RP-08-24.

McCarthy, Ryan W., Christopher Yang, and Joan Ogden. 2008. Interactions between hydrogen pathways and electricity supply: A stochastic representation of the California power sector. *Proceedings of the NHA Annual Hydrogen Conference 2008*, Sacramento, CA, March 30-April 3.

Ni, Jason. 2008. Motorization, vehicle purchase and use behavior in China: A Shanghai survey. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-27.

Ni, Jason and Donald Hubbard. 2008. Motorization pathway in China: Case study of Shanghai. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-29.

Salon, Deborah, Daniel Sperling, Alan Meier, Sinnott Murphy, Roger Gorham, and James Barrett. 2008. City carbon budgets: Aligning incentives for climate-friendly communities. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-17.

Sperling, Daniel and Sonia Yeh. 2008. Low carbon fuel standards. *Issues in Science and Technology*, Winter 2008.

Wang, Guihua. 2008. Lifecycle analysis of air quality impacts of hydrogen and gasoline transportation fuel pathways. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-28.

Zhao, Hengbing and Andrew F. Burke. 2008. Modeling and optimization of PEMFC systems and its application to direct hydrogen fuel cell vehicles. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-08-30.

EVENTS

Policy Symposium: Reducing Greenhouse Gas Emissions from Passenger Vehicles—What's Next?
April 21, 2008 (Cal EPA Building, Sacramento, California).

Jointly sponsored by STEPS and the California Air Resources Board.

Presentations by STEPS researchers

- Ken Kurani, Research Engineer, ITS-Davis
Panel Discussion Participant—Pricing Mechanisms: Market Mechanisms
- Dan Sperling, Professor and Director, ITS-Davis; Co-Director, STEPS Program
Opening Session Speaker

STEPS Research Symposium

May 13–14, 2008 (UC Davis campus)

Presentations by STEPS researchers

- Mark Delucchi, Research Scientist, ITS-Davis
Lifecycle Analysis of GHG Emissions from Biofuels
- Bryan Jenkins, Professor and Director, California Biomass Collaborative
Advanced Biofuels
- Steve Kaffka, Co-Director, California Biomass Collaborative
Biomass and Sustainability Summary
- Ken Kurani, Research Engineer, and Jonn Axsen, Ph.D. Candidate, ITS-Davis
Insights from Consumer Behavior
- Marshall Miller, Research Engineer, ITS- Davis
Status of Battery Technology for PHEVs and EVs
- Joan Ogden, Professor and Co-Director, STEPS Program
Transition Costs for Hydrogen and Its Alternatives
- Dan Sperling, Professor and Director, ITS-Davis; Co-Director, STEPS Program
A New Policy Landscape for Alternative Fuels (Keynote Address)
- Christopher Yang, Research Scientist, ITS-Davis
"80-in-50" –Options for Meeting California's 2050 GHG Goals in the Transportation Sector
- Sonia Yeh, Research Scientist, ITS-Davis
Water Resources Implications of Alternative Fuels

Presentations by invited guests

- Tom Cackette, California Air Resources Board
California Climate Change Policy: The Sequence, Underlying Analysis, and the Plan for AB 32 and AB 1493 (Keynote Address)
- John German, Honda
The Vehicle Product Development Cycle: Implications for Introducing Innovations
- Ed Rubin, Carnegie Mellon University
Carbon Capture and Sequestration and Fossil Fuel Synthesis
- Sunita Satyapal, U.S. Department of Energy
Progress and Prospects for Hydrogen and Fuel Cell Vehicles
- Margaret Singh, Argonne National Laboratory
Results from the DOE Multi-Path Study

Policymaker Briefing

October 18, 2008 (UC Davis campus)

Presentations by STEPS researchers

- David Greene, Corporate Fellow, Oak Ridge National Lab; Visiting Researcher, ITS-Davis
Feebates
- Susan Handy, Professor and Director, Sustainable Transportation Center
Vehicle Miles Traveled (VMT) and Land Use
- Mike McCoy, Co-Director, Information Center for the Environment
Vehicle Miles Traveled (VMT) and Land Use
- Joan Ogden, Professor and Co-Director, STEPS Program
Sustainable Transportation Energy Pathways Research
- Tom Turrentine, Director, Plug-in Hybrid Electric Vehicle Research Center
Plug-in Hybrid Electric Vehicles Using Electricity as a Fuel
- Sonia Yeh, Research Scientist, ITS-Davis
Low Carbon Fuel Standard

PUBLIC PROCESS ACTIVITIES

Dan Sperling, Sonia Yeh, and Nic Lutsey

- *UC Davis/UC Berkeley joint effort to conduct analysis on the California Air Resources Board's Low Carbon Fuel Standard*

Dan Sperling

- *National Research Council Committee on Energy*
- *American Physical Society Committee on Energy Efficiency*

Nathan Parker and Bryan Jenkins

- *Western Governors' Association analysis of biofuel resource assessment*

Joan Ogden

- *California Air Resources Board's Economic and Technology Advancement Advisory Committee for Implementation of AB 32*
- *National Research Council Committee for H₂ and Fuel Cell Transition Analysis; developed analysis for report with Chris Yang and Marc Melaina*
- *U.S. Department of Energy's Hydrogen Technical Advisory Committee*

Cynthia Lin

- *California State Controller's Council on Economic Advisors*

Anthony Eggert

- *Energy advisor to California Air Resources Board; involved with AB 32 scoping plan*

Joshua Cunningham

- *California Fuel Cell Partnership Working Group*

AWARDS in 2007 and 2008

Jonathan Hughes

- *2008 Barry McNutt Award for Best Paper on Energy, Transportation Research Board*

Bryan Jungers

- *2008 McWick Technology Foundation Fellowship*

Chris Knittel

- *2008 University of California, Davis Chancellor's Fellow Award*
- *2008 Barry McNutt Award for Best Paper on Energy, Transportation Research Board*

Wayne Leighty

- *2008 Chevron Corporation Graduate Fellowship*

Xuping Li

- *2008-2009 Women's Transportation Society Helene M. Overly Memorial Graduate Scholarship*

Zhenhong Lin

- *2007 Best Paper from the Scientific Committee of the 2nd World Congress of Young Scientists on Hydrogen Energy Systems*

David McCollum

- *2008 Eisenhower Transportation Fellowship from the U.S. Department of Transportation*
- *2007-2008 ITS-Davis Outstanding Master's Thesis Award*

Colin Murphy

- 2008 *Eisenhower Fellowship*

Mike Nicholas

- 2007 *Barry McNutt Award for Best Paper on Energy, Transportation Research Board*

Joan Ogden

- 2007 *University of California, Davis Distinguished Scholarly Public Service Award*
- 2007 *Barry McNutt Award for Best Paper on Energy, Transportation Research Board*

Nathan Parker

- 2007 *Charley V. Wootan National Student Award for Best Master's Thesis in Transportation Policy and Planning*

Dan Sperling

- 2008 *Barry McNutt Award for Best Paper on Energy, Transportation Research Board*
- 2008 *Portion of the Nobel Peace Prize for his contributions to the United Nations' Fourth Intergovernmental Panel on Climate Change (IPCC)*

Jonathan Weinert

- 2007 *UC Davis Sustainable Transportation Center's Outstanding Student of the Year*

DEGREES GRANTED in 2007 and 2008 (current employer listed)

Obadiah Bartholomy, M.S., *Transportation Technology and Policy* (Sacramento Municipal Utility District)

Joel Bremson, M.S., *Transportation Technology and Policy* (Ph.D. candidate, TTP)

Gustavo Collantes, Ph.D., *Transportation Technology and Policy* (State of Washington)

Reid Heffner, Ph.D., *Transportation Technology and Policy* (Booz Allen Hamilton)

Ryohei Hinokuma, M.S., *Transportation Technology and Policy*

Zhenhong Lin, Ph.D., *Civil and Environmental Engineering* (Oak Ridge National Laboratory)

Wayne Leighty, M.S., *Transportation Technology and Policy; M.S., Agricultural and Resource Economics* (Ph.D. candidate, TTP)

Nic Lutsey, Ph.D., *Transportation Technology and Policy* (ITS-Davis)

David McCollum, M.S. *Transportation Technology and Policy; M.S., Agricultural and Resource Economics* (Ph.D. candidate, TTP)

Nathan Parker, M.S., *Transportation Technology and Policy* (Ph.D. candidate, TTP)

Brent Riffel, M.S., *Transportation Technology and Policy* (Lifecycle Associates)

Guihua Wang, Ph.D., *Civil and Environmental Engineering* (California Air Resources Board)

Jonathan Weinert, Ph.D., *Transportation Technology and Policy* (Chevron)

Brett Williams, Ph.D., *Transportation Technology and Policy* (UC Berkeley)