MICHAEL Q. WANG, Ph.D

Vehicle and Fuel Systems Analyst
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SUMMARY

Dr. Wang has been working in Argonne National Laboratory's Center for Transportation Research since 1991. He currently is the manager of the Center's Systems Assessment Section. Dr. Wang's research areas include evaluation of energy and environmental impacts of advanced vehicle technologies and new transportation fuels, assessment of market potentials of new vehicle and fuel technologies, and projection of transportation development in emerging economies such as China. He has published extensively in the area of life-cycle analysis of vehicle/fuel systems, especially biofuels. In addition to his work in the United States, Dr. Wang has provided reviews and technical advice on advanced vehicle technologies and new transportation fuels for governmental agencies, automotive companies, and energy companies in China, Europe, South Africa, Southeast Asia, and Japan.

Dr. Wang has been responsible for developing Argonne's GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) software model for the well-to-wheels analysis of vehicle/fuel systems. Using GREET, Dr. Wang and his team have conducted life-cycle analyses of advanced vehicle technologies and new transportation fuels for the U.S. Department of Energy, State of Illinois, General Motors Corporation, and the U.S. Environmental Protection Agency, among many other organizations. Currently, GREET has more than 7,500 registered users worldwide.

Dr. Wang is active in professional organizations including the Society of Automotive Engineers and the Transportation Research Board, chairing committees of professional associations, and organizing technical sessions in major conferences and workshops. He has participated in several annexes of the International Energy Agency. He serves on the board of the not-for-profit Energy Foundation and on the board of the International Council for Clean Transportation; as chair of the Subcommittee on the International Aspects of Transportation Energy and Alternative Fuels of the U.S. Transportation Research Board; as a technical advisor to China Automotive Technology and Research Center; and as a member of the External Advisor Board of Institute for Environmental Science and Policy at University of Illinois at Chicago.

Dr. Wang has authored 154 publications (66 journal articles and book chapters, 23 conference papers, 30 peer-reviewed formal reports, and 35 informal reports and technical memorandums) and made 123 invited technical presentations at professional conferences and to organizations.

EDUCATIONAL BACKGROUND

Ph.D., 1992 Environmental Science, University of California at Davis, CA. Thesis: the

	Use of a Marketable Permit System for Light-Duty Vehicle Emission Control
M.S., 1989	Environmental Science, University of California at Davis, CA
B.S., 1982	Agricultural Meteorology, China Agricultural University, Beijing, China

PROFESSIONAL EXPERIENCE

1993 to present	Section manager and vehicle and fuel systems analyst, Center for Transportation Research, Energy Systems Division, Argonne National Laboratory
1992-1993	Assistant research engineer, Institute of Transportation Studies, University of California at Davis
1991-1993	Special-term scientist appointee, Center for Transportation Research, Energy Systems Division, Argonne National Laboratory
1991-1992	Post-doctoral researcher, Center for Transportation Analysis, Oak Ridge National Laboratory
1989-1991	Post-graduate researcher, Department of Civil Engineering and Division of Environmental Studies, University of California at Davis
1982-1985	Lecturer, Agro-Meteorology Department, China Agricultural University, Beijing, China

PROFESSIONAL ASSOCIATION MEMBERSHIPS

04/2008 to present	Member, Alternative Transportation Fuels Committee, Transportation Research Board, National Research Council, USA
02/2002 to present	Chair, Subcommittee on International Aspects of Transportation Energy and Alternative Fuels, Transportation Research Board, National Research Council, USA
01/1998 to present	Member, North American Chinese Overseas Transportation Association
03/1997-08/2007	Member, Energy Conservation Committee, Transportation Research Board, National Research Council, USA
07/1990 to present	Member, Mobile Source Committee, Air and Waste Management Association
09/1993 to present	Member, Society of Automotive Engineers

MAJOR PROFESSIONAL ADVISORSHIPS

06/2007 to present	Member, board of the International Council for Clean Transportation.
11/2004 to present	Member of the Technical Advisory Group for project of Total Fuel Cycle Analysis of Marine Transportation, Rochester Institute of Technology, New York
10/2004 to present	Technical advisor to China Automotive Technology and Research Center
08/2004-2005	Critical reviewer for life-cycle analysis of gas-to-liquids, SasolChevron, London, U.K.
02/2004-2005	Member of the International Team, Sustainable Transportation Task Force, China Council for International Cooperation on Environment and Development
09/2003 to present	Member of the External Advisory Board, Institute for Environmental Science and Policy, University of Illinois at Chicago
04/2001 to present	Board director, the Energy Foundation, San Francisco, CA
06/2002-09/2006	Member of a Ph.D. student dissertation committee, University of Illinois at Chicago
02/2002-04/2003	Technical reviewer of a gas-to-liquid study, ConocoPhillips, Houston, TX
01/2000-01/2003	Board director, North American Chinese Oversea Transportation Association
07/2002-12/2002	Reviewer of a life-cycle study of Fischer-Tropsch diesel, Sasol Technology Company, South Africa
01/2002-10/2002	Reviewer of a European well-to-wheels study on vehicle/fuel systems, Fuel Cell Activities Group of the General Motors Corporation, Detroit, MI
02/2001	Reviewer of a gas-to-liquid study, the Shell Gas and Power, U.K.
05/2000-10/2001	Reviewer of a study on energy and emission benefits of fuel ethanol in China, Environmental Resources Management, Hong Kong
07/1999-07/2001	Member of the Technical Advisory Committee for a project on fuel cycle analyses of vehicle/fuel systems, California Air Resources Board, Sacramento, CA
05/2000-05/2003	Member of the Technical Review Committee for a project on life-cycle assessment of corn stover to ethanol production, National Renewable Energy Laboratory, Golden, CO

01/1998-10/1998 Member of the Peer Review Committee for a project on life cycle analysis of biomass to fuel oxygenates, California Air Resources Board, California Energy Commission, California Department of Forestry and Fire Protection, and California Department of Food and Agriculture, Sacramento, CA

01/1996-10/1996 Member of the Technical Advisory Committee for a study on economics and environmental impacts of alternative-fueled vehicles, Canadian Energy Research Institute, Calgary, Alberta, Canada

SELECTED PEER-REVIEWED JOURNAL ARTICLES AND BOOK CHAPTERS

Wang, M., 2008, "Well-to-Wheels Energy and Greenhouse Gas Emission Results and Issues of Fuel Ethanol," forthcoming in book chapter in Proceedings of Workshop on Land-Use Change Modeling for Biofuel Production.

Huo, H., M. Wang, C. Bloyd, and V. Putsche, 2008, "Life-Cycle Assessment of Energy and Greenhouse Gas Effects of Soybean-Derived Biodiesel and Renewable Fuels," submitted to Envrionmental Science & Technology.

Huo, H., Y. Wu, and M. Wang, 2008, "Well-to-Wheels Assessment of Energy Use, GHG Emissions and Emissions of Criteria Pollutants from Various Vehicle/Fuel Systems," submitted to Journal of the Air & Waste Management Association.

Wu, M., M. Wang, J. Liu,, and H. Huo, 2008, Life-Cycle Energy and Emission Assessment of Corn-Based Butanol as a Potential Transportation Fuel," submitted to Biotechnology Progress.

M. Wang, M. Wu, H. Huo, and J. Liu, 2008, "Well-to-Wheels Energy Use and Greenhouse Gas Emissions of Brazilian Sugarcane Ethanol Production Simulated by Using the GREET Model," forthcoming in International Sugar Journal.

Huo, H., M. Wang, L. Johnson, D. He, 2007, "Projection of Chinese Motor Vehicle Growth, Oil Demand, and CO2 Emissions Through 2050," Transportation Research Record, No. 2038, 69–77.

Joseck, F., M. Wang, and Y. Wu, 2007, "Potential Energy and Greenhouse Gas Emission Effects of Hydrogen Production from Coke Oven Gas in U.S. Steel Mills," forthcoming in *the International Journal of Hydrogen.*

He, D., M. Wang, and A. Thomas, 2007, "Urban Air Pollution Challenges and Solutions to China's Urban Transportation Development," *International Journal of Environment and Pollution*, Vol. 30, No.1: pp.154-171.

Wang, M., M. Wu, and H. Hong, 2007, "Life-Cycle Energy and Greenhouse Gas Emission Impacts of Different Corn Ethanol Plant Types," *Environmental Research Letters*, Vol. 2 (2007), 024001 (13 pages).

Wu, Y., M. Wang, P. Sharer, and A. Rousseau, 2007, "Well-to-Wheels Results of Energy Use, Greenhouse Gas Emissions, and Criteria Pollutant Emissions of Selected Vehicle/Fuel Systems," SAE paper 2006-01-0377, SAE 2006 Transactions Journal of Engines.

Wu, M., Y. Wu, and M. Wang, 2006, "Energy and Emission Benefits of Alternative Transportation Liquid Fuels Derived from Switchgrass: a Fuel Life Cycle Analysis," *Journal of Biotechnology Progress*, Vol. 22: 1012-1024.

Wu, Y., Michael Q. Wang, Anant D. Vyas, David C. Wade, Temitope A. Taiwo, 2006, "Well-to-Wheels Analysis of Energy Use and Greenhouse Gas Emissions of Hydrogen Produced with Nuclear Energy," *Nuclear Technologies*, Vol.155, Aug. 2006: 192–207.

Moon, P., A. Burnham, and M. Wang, 2006, "Vehicle-Cycle Energy and Emission Effects of Conventional and Advanced Vehicles," SAE paper 2006-01-0375, SAE Congress, Detroit, MI, April 3.

Wang, M., et al., 2005, *Toward a Sustainable Future: Energy, Environment and Transportation in China*, China Communications Press, Beijing, China, 2005.

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He, K., H. Huo, Q. Zhang, D. He, F. An, M. Wang, and M. Walsh, 2005, "Oil Consumption and CO_2 Emissions in China's Road Transport: Current Status, Future Trends, and Policy Implications," *Energy Policy*, Vol. 33: 1499–1507.

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M. Wang, 2004, "Emission Control Cost-effectiveness of Mobile Source Control Measures: Summary and Adjustments of Recent Results," *Transport Policy*, Vol. 11, No. 2: 155–169.

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Wang, M.Q., C.L. Saricks, and M. Wu, 1999, "Fuel Ethanol Produced from U.S. Midwest Corn: Help or Hindrance to the Vision of Kyoto?" *Journal of the Air and Waste Management Association,* **49**:756–772.

Ross, M., R. Goodwin, R. Watkins, T. Wenzel, and M.Q. Wang, 1998, "Real World Emissions from Conventional Passenger Cars," *Journal of the Air and Waste Management Association*, **48**:502–515.

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Brinkman, N., M. Wang, T. Weber, T. Darlington, 2005, *Well-to-Wheels Analysis of Advanced Fuel/Vehicle Systems — A North American Study of Energy Use, Greenhouse Gas Emissions, and Criteria Pollutant Emissions*, General Motors Corporation and Argonne National Laboratory, May.

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General Motors Corporation, Argonne National Laboratory, BP, ExxonMobil, and Shell, 2001, *Well-to-Wheel Energy Use and Greenhouse Gas Emissions of Advanced Fuel/Vehicle Systems: A North American Analysis, Volume 3, Well-to-Tank Energy Use and Greenhouse Gas Emissions of Transportation Fuels*, ANL/ES/RP-104528, June.

Winebrake, J., D. He, and M. Wang, 2000, *Fuel-Cycle Emissions for Conventional and Alternative Fuel Vehicles: An Assessment of Air Toxics*, ANL/ESD-44, Center for Transportation Research, Argonne National Laboratory, Argonne, IL, Aug.

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Wang, M., C. Saricks, and D. Santini, 1999, *Effects of Fuel Ethanol Use on Fuel-Cycle Energy and Greenhouse Gas Emissions*, ANL/ESD-38, Center for Transportation Research, Argonne National Laboratory, Argonne, IL, Jan.

Wang, M.Q., M.M. Mintz, M. Singh, K. Stork, A. Vyas, and L. Johnson, 1998, *Assessment of PNGV Fuels Infrastructure, Phase 2 Report: Additional Capital Needs and Fuel-Cycle Energy and Emissions Impacts,* ANL/ESD-37, Center for Transportation Research, Argonne National Laboratory, Argonne, IL, Aug.

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