February 2004

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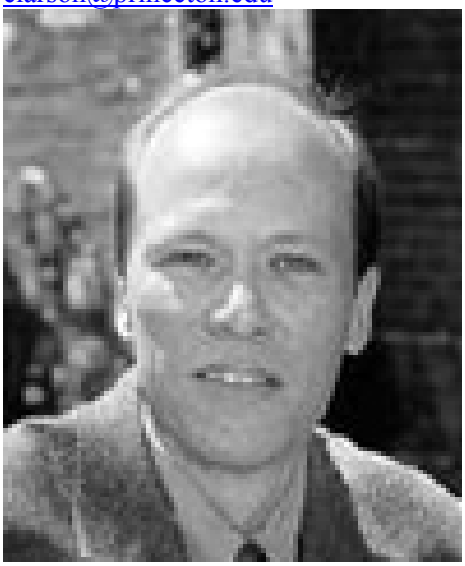

Career Sketch

Eric Larson is a senior member of the Energy Technology Assessment/Energy Policy Analysis Group at Princeton University's Princeton Environmental Institute. (Before 2001, his group was part of the Center for Energy and Environmental Studies at Princeton.) His research interests include technical, economic, and policy-related assessments of advanced clean-energy systems, especially for electric power and transportation fuels production from carbonaceous fuels (biomass, coal, natural gas) and for efficient end use of energy. His work addresses technologies of relevance to developed and developing countries. He collaborates widely with colleagues domestically and internationally.

He currently co-leads a program on low-emission energy strategies and technologies for China, involving a collaboration with colleagues at Tsinghua University (Beijing). This program aims to describe least-cost energy futures for China for the long term based on carbonaceous fuels and characterized by near-zero emissions of both local air pollution and greenhouse gases and to define critical paths to realizing such long-term futures, including identifying key near-term enabling R&D, technologies, strategies, and policies.

He is also one of the task leaders on a multi-institution project to assess the long-term sustainable potential for biomass energy in the United States. His past biomass-related research efforts have included analysis of advanced gasification-based technologies for power generation and for production of methanol, hydrogen, and other transportation fuels. His work has included industry-specific analyses of potential gas-turbine based biomass electricity supply and use in sugarcane processing and pulp and paper manufacturing industries. He has also worked on transportation fuels from municipal solid waste. He has collaborated with colleagues on analysis of the economics of alternative future fuels/vehicles.

Larson lectures occasionally in the Mechanical and Aerospace Engineering Department and in the Woodrow Wilson School of Public and International Affairs at Princeton. He supervises graduate and undergraduate research.

Among his outside activities, Larson advises the Global Environment Facility regarding developing and implementing of proposals from developing-country governments, including proposals for the development of national energy efficiency and renewable energy programs and for accelerating the commercialization of advanced clean-energy technologies for application in developing countries. He is a technical reviewer for *Biomass and Bioenergy, Combustion Science and Technology, Energy for Sustainable Development, Energy Policy, Energy, Journal of Engineering for Gas Turbines and Power, Resources Conservation and Recycling*, and other journals. He also holds the position of President of the International Energy Initiative, which has regional offices in Bangalore, Sao Paulo, and Cape Town.

Larson has a B.S. from Washington University in St. Louis (1979) and M.S. (1981) and Ph.D. (1983) from the University of Minnesota (Minneapolis), all in mechanical engineering.

Professional Positions

Princeton Environmental Institute, Princeton University

- 1999 - present: Research Engineer

Center for Energy and Environmental Studies, Princeton University

- 1991- 1999: Research Engineer

- 1983-1991: Research Staff

Department of Environmental and Energy Systems Studies, Lund University, Sweden

- Visiting Research Engineer, 1988-1989

Current Research Interests

- Engineering and economic assessment and systems modeling relating to advanced, low-environmental impact energy conversion of carbonaceous fuels (biomass, coal, natural gas).
- Advanced energy technologies: gas turbines, gasifiers, chemicals synthesis, fuel cell vehicles.
- Modeling related to sustainable coal and biomass energy strategies for China.
- Long-term biomass energy strategies for the United States.

Selected Invited Talks

- *Future Prospects for Biomass as a Major Global Energy Source*, Dartmouth College, Hanover, NH, 2 May 1996.
- *Advanced Technologies for Biomass Conversion to Energy*, keynote talk at the 2nd Olle Lindstrom Symposium on Renewable Energy, Royal Inst. of Technology, Stockholm, 9 June 1999.
- *Commercialization Prospects for Fuel Cell Buses***,** Workshop on Commercialization of Fuel Cell Buses: Potential Roles for the GEF, United Nations Headquarters, New York, 27 April 2000.
- *Biomass Integrated-Gasifier/Gas Turbine Combined Cycle Technology for Sugarcane Processing Industries: Possibilities for Cuba*, International Workshop on Sugarcane Energy, Havana, 7 November 2000.
- *Polygeneration: a Fundamental Strategy for Environmentally-Sustainable Future Energy for China?***,** presented at China headquarters of BP (British Petroleum), Beijing, 19 June 2001.
- *The Carbon Challenge*, Community Learning Day session on Environmental and Societal Tradeoffs in Meeting Society's Demand for Electricity, College of New Jersey, 17 October 2001.
- *Technology Strategies for Addressing China's Energy Challenges*, Associated Faculty Forum, Princeton Environmental Institute, Princeton University, 9 April 2002.
- *Exploring Implications to 2050 of Energy-Technology Options for China*, 6th Conference on Greenhouse Gas Control Technologies (GHGT-6), Kyoto, Japan, 1 October 2002.
- *Synthetic Fuels Production by Indirect Coal Liquefaction*, Workshop on Coal Gasification for Clean and Secure Energy (convened by Task Force on Energy Strategies and Technologies of the China Council for Int'l. Cooperation on Environment and Development), Beijing, 25 August 2003.
- *A Cost-Benefit Analysis of Black Liquor Gasification Combined Cycle Systems*, National Energy Technology Laboratory, US Department of Energy, Morgantown, WV, 21 October 2003.

Selected Publications (total number of publications ~170)

- E.D. Larson, 1993, "Technology for Electricity and Fuels from Biomass," *Annual Review of Energy and the Environment*, **18**:567-630.
- R.H. Williams, E.D. Larson, R.E. Katofsky, and J. Chen, 1995, "Methanol and Hydrogen from Biomass for Transportation," *Energy for Sustainable Development: The Journal of the International Energy Initiative*, **I**(5):18-34.
- S. Consonni and E.D. Larson, 1996, "Biomass-Gasifier/Aeroderivative Gas Turbine Combined Cycles, Part A: Technologies and Performance Modeling, and Part B: Performance Calculations and Economic Assessment," *Journal of Engineering for Gas Turbines and Power*, **118**:507-525.
- C.I. Marrison and E.D. Larson, 1996, "A Preliminary Estimate of the Biomass Energy Production

Potential in Africa in 2025 Considering Projected Land Needs for Food Production," *Biomass and Bioenergy*, **10**(5-6):337-351.

- E.D. Larson, E. Worrell, and J.S. Chen, 1996, "Clean Fuels from Municipal Solid Waste for Fuel Cell Buses in Metropolitan Areas," *Resources, Conservation, and Recycling*, **17**:273-298.
- E.D. Larson, 2000, "Modernized Biomass Energy," in L. Gomez-Echeverri (ed.), *Climate Change and Development*, The Yale School of Forestry and Environmental Studies, Yale University, New Haven, CT, pp. 271-291.
- S. Kartha and E.D. Larson, 2000, *Bioenergy Primer: Modernized Biomass Energy for Sustainable Development*, United Nations Development Program, New York, NY, 133 pages.
- E.D. Larson and T.B. Johansson, 2001, "Future Demands on Forests as a Source of Energy," in *Forests in a Full World*, G.M. Woodwell (ed.), Yale University Press, New Haven, pp. 111-160.
- E.D. Larson, R. Hosier, C. Page, "Hydrogen Fuel-Cell Buses for Megacities of Developing Countries," *Sustainable Development International*, Spring 2002 edition, pp. 99-104.
- E.D. Larson, S. Consonni, and R. Katofsky, *A Cost-Benefit Assessment of Biomass Gasification Power Generation in the Pulp and Paper Industry*, Final Report, Princeton Environmental Institute, Princeton University, 8 October 2003.
- E.D. Larson, Z. Wu, P. DeLaquil, W. Chen, and P. Gao, "Future Implications of China's Energy-Technology Choices," *Energy Policy*, **31**(12): 1149-1204, 2003.
- C. Azar, K.Lindgren, E.D. Larson, K. Möllersten, and J. Yan, "Carbon capture and storage from fossil fuels and biomass – Costs and potential role in stabilizing the atmosphere," submitted to *Climatic Change*, November 2003.
- R.H. Williams and E.D. Larson, "A Comparison of Direct and Indirect Liquefaction Technologies for Making Fluid Fuels from Coal," *Energy for Sustainable Development*, VII(4), December 2003.
- E.D. Larson and T. Ren, "Synthetic Fuels Production by Indirect Coal Liquefaction," *Energy for Sustainable Development*, **VII**(4), December 2003.
- P. DeLaquil, W. Chen, and E.D. Larson, "Modeling China's Energy Future," *Energy for Sustainable Development*, **VII**(4), December 2003.
- Zheng, H., Li, Z., Ni, W., Larson, E.D., and Ren, T., "Case Study of a Coal Gasification-Based Energy Supply System for China," Energy for Sustainable Development, VII(4), December 2003.
- J.M. Ogden, R.H. Williams, and E.D. Larson, "Societal Lifecycle Costs of Cars with Alternative Fuels/Engines," Energy Policy, 32: 7-27, 2004.