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Dr. Gaines is currently engaged in studies of ways to reduce petroleum use and other impacts from freight transport. Since she joined Argonne in 1976, she has examined costs and impacts on energy use and environment of production and recycling of advanced-design automobiles, trucks, and trains, and batteries. Because of her primary interest in problem solving and efficient use of resources, she has written handbooks of energy and material flows in petroleum refining, organic chemicals, and copper industries. These provided background for a series of reports and papers on technical and institutional issues involved in recycling discarded tires, packaging, and other energy-intensive materials. Dr. Gaines has examined the potential growth of electricity demand by industry and performed technical and economic analyses of alternative energy supply technologies, including hydrogen and biomass-derived fuels.

Dr. Gaines was awarded a Ph.D. in physics from Columbia University in 1977 and a B.A. cum laude in chemistry and physics from Radcliffe College (Harvard University) in 1969.

Selected Recent Publications

Trading of Locomotive NO_x Emissions: A Potential Success Story (2002)
Operation of an Aluminum-Intensive Vehicle: Report on a Six-Year Project (2002)
Nickel-Metal Hydride Batteries: Energy Use and Emissions from Production and Recycling (2002)
Analysis of Technology Options to Reduce the Fuel Consumption of Idling Trucks (2000)
Costs of Lithium-Ion Batteries for Vehicles (2000)
Estimate of Electric Vehicle Production Cost (1999)
Total Fuel Cycle Impacts of Advanced Vehicles (1999)
Lifecycle Analysis for Freight Transport (1998)