

**MECHANICAL ENGINEERING DEPARTMENT
ME 8773-8774**

Personal Mobility in 2027: Energy and the Vehicles of Tomorrow

by

Giorgio Rizzoni

**The Ford Motor Company Chair in Electromechanical Systems
Professor of Mechanical and Electrical Engineering
Director, Center for Automotive Research
The Ohio State University
Columbus, OH 43210-1278**

Wednesday, March 26, 2008

3:15 p.m. — Refreshments before the seminar

3:30 p.m. — Graduate Seminar

Room 1130 ME

ABSTRACT — Climate change is a reality. Simultaneously, resources we are accustomed to having readily available to meet our energy needs are diminishing, becoming more costly, and contributing to climate change and/or other adverse environmental consequences. As discussed in this presentation, the relationship between energy supplies and transportation demands clearly shows that a major mismatch between needs and resources is imminent. Predictions of the world's petroleum supplies and the primary dependence of transportation systems on petroleum show that there will be a substantial reduction of these supplies in the future unless major changes in transportation and energy market and policy take place.

There is perhaps no better symbol of the twentieth century than the automobile. It is the dominant means of transport aspired to throughout the world; indeed, should demand for today's automobile continue to rise at historical levels, environmental and energy problems will make energy and transportation unsustainable for our society. Thus, the role of the automobile in the future needs to be rigorously re-examined. Before looking ahead at how future energy needs might be met, the current state and a glimpse of the recent past are briefly analyzed: transportation systems, their development, and the needs established by the society that motivate the continuous expansion of such systems will be outlined.

How to account for the depletion characteristics of transportation systems? Scenarios of transportation might look like in 20 years are suggested in this presentation. New and existing technologies could change work and driving patterns resulting in a different mix of vehicles and communication architecture could be the backbone of the interaction between vehicles and utility grid. In this presentation, it will be argued that we must begin fundamental changes in our energy posture now, phasing in alternative energy resources and technologies over the next two decades and beyond; our approach must be two-pronged, featuring more efficient energy use and the wider use of renewable energy sources; much of the needed technology already exists, or requires relatively modest development, but significant infrastructure and policy changes will be required.

BIO — Giorgio Rizzoni, the *Ford Motor Company Chair in ElectroMechanical Systems*, is a Professor of Mechanical and Electrical Engineering at The Ohio State University. He received Ph.D. from the University of Michigan in 1986. Since 1999 he has been the director of the OSU Center for Automotive Research.

Dr. Rizzoni's research interests are in system dynamics, measurements, control, and fault diagnosis with application to automotive systems. He has a special interest in future ground vehicle propulsion systems.

Prof. Rizzoni is a Fellow of IEEE (2004), a Fellow of SAE (2005), a recipient of the 1991 National Science Foundation Presidential Young Investigator Award, and of several other technical and teaching awards. Dr. Rizzoni is a past Chair of the International Federation of Automatic Control (IFAC) Technical Committee on Automotive Control, and past Chair of the ASME Dynamic Systems and Control Division. He has been an Associate Editor for IEEE and ASME journals.

Informal Faculty Luncheon: Wednesday, March 26, 2008, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Giorgio Rizzoni will be able to attend. Faculty Host is Prof. Rajesh Rajamani.