

# OPTIMIZATION AND ECONOMIC MODELING OF ENERGY SYSTEM CENTERING CO<sub>2</sub> ISSUES

Panos M. Pardalos

*University of Florida*  
*e-mail: pardalos@ufl.edu*

Global warming has become a critical issue to our planet, Earth. The continuing rise in the average temperature of the atmosphere and ocean causes serious problems such as: glacier shrinkage, sea level elevation, species extinction, agricultural output decrease, and extreme weather events. Many countries, territories, and international organizations have joined together to curb the global warming trend. The United Nations Framework Convention on Climate Change (UNFCCC) began in 1992 and Kyoto protocol, initiated in 1997. Among the many efforts, curbing Carbon Dioxide (CO<sub>2</sub>) emission has been an important one.

Along this line, research efforts to incorporate CO<sub>2</sub> in energy systems operations have surged in recent years. This talk will review the mathematical modeling, optimization techniques, and economic analysis of CO<sub>2</sub> in energy systems. This will include CO<sub>2</sub> policy and market modeling, integration of CO<sub>2</sub> mitigation into power systems' operations and strategic planning. On the other side, as the silver bullet for solving CO<sub>2</sub> emission problems, carbon capture and storage will be discussed by showing the techno-economic analysis and related optimization models.