Environmental Challenges and Opportunities in Nanoelectronics Manufacturing

Farhang Shadman
Regents Professor (Chemical Engineering; Optical Sciences)
Director of NSF/SRC Engineering Research Center
The University of Arizona
Tucson, Arizona 8572, USA

Manufacturing in nano-scale is not a simple extrapolation of the current and conventional manufacturing practices. The shift to nano scale creates both major issues as well as significant opportunities in performance, cost, and environmental impact for electronics industry. This presentation focuses on both the positive and the negative environmental impacts of this inevitable paradigm change. The inter-relationship between the three sustainability factors (performance, cost, and environmental impact) for future electronics manufacturing will be analyzed. In particular, the challenges related to resource requirements and utilization (water, energy, and chemicals) will be discussed. Examples of unique opportunities for environmental gain, that nano-scale manufacturing can provide, will be presented.