

Abstract for ISMI 2006

Allan D. Chasey, PhD, PE
Del E. Webb School of Construction
Arizona State University

Title: Challenges for LEED for Fabs

Sustainability and Sustainable Development are the buzz words in today's society. Since its introduction with the Bruntland Commission Report in 1987, the philosophy of Sustainability and Sustainable Development have made significant progress. It has moved from the traditional ideas of economy and environmentalism to discussions and actions in corporate board rooms. As the Global Reporting Initiative of the UN Environment Program has indicated, business responsibility extends beyond the shareholders to people and places both near and distant from a company's physical facilities. Bearing responsibility and participating actively are not just a matter of compliance. For corporations, adherence to sustainability norms has now turned into a matter of survival and competitive abilities which also carry monetary rewards.

The needs/requirements for energy conservation and at the same time facility cost reduction have not been lost on the International Technology Roadmap for Semiconductors (ITRS). The ESH chapter indicates that one of the difficult challenges relates to facilities energy and water optimization and another deals with sustainability. Both of these deal with the need to develop methodologies, processes, and/or systems that will provide a comprehensive understanding of the way that facilities, process equipment, and resources affect the responsible performance in the ESH arena. At the same time, the Factory Integration (FI) chapter responds to the need to reduce facility costs even in the face of increasing complexity. These can be diametrically opposite.

ESH needs must be integral in the planning, design, construction and operations of the semiconductor fabrication facility. A current measure that is gathering publicity and notoriety is the program of the US Green Building Council (USGBC) commonly called LEED (Leadership in Environmental and Energy Design). This presentation will look at the LEED program from the USGBC, the US Environmental Protection (EPA) Labs21 Environmental Performance Criteria (EPC), and how they relate or do not relate to the semiconductor facility.

As pointed out by the EPA Labs21 EPC, lab facilities present a unique challenge for energy efficiency and sustainable design. Fabs more so due to the complexity of systems, health and safety requirements due to hazardous materials, energy use intensity that is absolutely increasing even though the processing energy use is relatively decreasing, and environmental impacts that could limit the industries ability to expand existing facilities or build new ones. This presentation will address the challenge of defining and developing metrics for a "LEED for Fabs" that will assist in designing and construction resource efficient fabrication facilities, responding to the ESH needs at the same time responding to the FI challenge to reduce facility cost.