

Abstract for ISMI 2006

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Title: Vision for Sustainability: Green Products Made With Green Processes in Green Fabs, Enabling Sustainable Communities

The semiconductor industry has an outstanding record of accomplishment in reducing the environmental impacts of our processes and operations. Many companies have made dramatic reductions in air emissions, waste generation, energy use, and water consumption. Conservation continues through the development of quantitative targets for water and energy use efficiency through the World Semiconductor Council (WSC) and the commitment to PFC emissions reductions that began over ten years ago.

The advent of “green” fab designs has been a key to this success, and design evolution continues through projects such as Texas Instruments’ LEED registered fab in Richardson, Texas. The International Technology Roadmap for Semiconductors (ITRS) includes a comprehensive set of environmental objectives including initiatives that extend beyond manufacturing operations including: design for EHS, advanced chemical selection screening, and product stewardship. Expanding global regulations and broadening external stakeholder expectations are driving our industry to extend environmental excellence beyond the green fab to R&D, supply chain, products, external partnerships, and community development. We are expanding our objectives to embrace sustainability – the balancing of environmental, economic, and quality of life factors.

From a global perspective the case for sustainability has also been articulated by a well known equation from environmental economics (Ehrlich and Holden, 1971 and 1974) is “IPAT”:

$I = P \times A \times T$, where

I = total environmental impact

P = population

A = affluence

T = environmental impacts from technology

By 2025 population is expected to increase from 6.5 billion today to 7.9 billion – an increase of over 21%. Average world per capita GNP (Gross National Product) is expected to increase by at least 3% per year for an increase of 80% over the same period. To maintain total environmental impact (I) at current levels requires the impact of technology be reduced at least 64%, or about 2.5% per year, to offset population growth

and higher consumption associated with rising GNP. This represents a continuing challenge for the semiconductor industry and requires a broad sustainability approach.

This paper and presentation will describe Intel's lessons learned in implementing an integrated sustainability approach and discuss opportunities for semiconductor industry collaboration for sustainable development.