Design for Environment
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Project Objectives
Based on Design for Environment (DfE) methodology, develop a set of environmental performance metrics and establish best practices for continuous improvement of future design and manufacturing practices, using product life-cycle assessment and environmental assessment techniques.

Cisco Vision
For a typical product, 70% of the cost of development, manufacture and use is determined in its design phase. By integrating environmental considerations into the upfront product design, a company can increase energy efficiency, avoid hazardous substances, reduce waste of materials and reduce costs.

Conclusion
- Focus on energy efficient design techniques, since this element can be implemented the soonest.
- Maintain awareness of hazardous material legislation and innovative “environmentally friendly” materials.
- Embed Design for Recyclability methods into product design DNA.

Energy Efficiency
Determine design techniques for electronic devices that reduces power consumption in four key areas: ASICs, thermal management, power supplies and operational modes.

ASICs
- Implement flop clock gating, RAM clock gating and other gating techniques to reduce power consumption.
- Reduce leakage power in standby/idle mode since traditionally considered only in active mode.
- Estimate power consumption at design level since that level has the highest potential for power savings.

Thermal Management
- Consider different materials for heat sinks by weight vs. cost as determining factor.
- Consider phase change materials (PCMs) to efficiently absorb and dispel heat, maintaining thermal management throughout the device.
- Virtual thermal mapping such as Flotherm efficiently determines hot spots on PCB and allows engineer to change design – saving time and money.

Power Supplies
- Define proper operational and saving modes.
- Proper labeling of power adapter energy efficiency in clear and standardized manner.
- Conformance with Energy Star requirements.

Hazardous Materials
Cisco’s customers’ hazardous substance requirements
- Specifically interested in requirements that are more stringent than regulatory requirements, since some customer requirements are more stringent than regulations.
- Cisco must decide what position to take regarding hazardous substances.
  - Compliance position
    - Continue business-as-usual.
    - Leadership position
    - Proactive phase-out of hazardous materials.
    - Marketing strategy for Cisco emphasizes leadership position.
  - Consider Strategic Partner requirements during design phase.
  - Open dialogue with vendors and maintain awareness of environmentally friendly materials.