1B   Materials Selection
Our task is to engineer the future of solar electricity.
Team leaders: Student C and Student D

due 4-22-10: i) one paragraph each on required Materials Attributes and Analysis leading to recommended materials; ii) two F-o-M plots supporting analysis and conclusions.

The selection of materials currently being used for the PV energy conversion is large and diverse: ranging from liquid junction 'Graetzel' cells to silicon wafers. This analysis stage should be constructed as a funnel from determining, high level decisions to supporting, detailed decisions. The key performance factors for solar cell materials are absorption, charge collection, reflectance, current extraction and light trapping.

High level: i) to produce a significant fraction of electrical energy usage, a guaranteed materials availability and a learning curve that is valid over the time of deployment; ii) 'cradle-to-grave' sustainability; iii) performance capable of meeting constraints.

Supporting level: materials for i) substrate (sometimes called 'handle' – e.g., glass for thin films); ii) semiconductor absorber; iii) AR coating; iv) contact metallization; v) semiconductor dopants; ..) other materials

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