LIFE CYCLE PERSPECTIVE ANALYSIS OF SINGLE WALL CARBON NANOTUBE Li-ION BATTERY ANODE ENERGY CONSUMPTION

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In the search for environmentally preferable energy alternatives, some engineers, researchers, and policy makers may fail to consider the life cycle perspective. As new innovative energy technologies are employed it is ever more important to comprehend the environmental implications. Currently battery technology is the barrier preventing hybrid plug in electric vehicles from becoming commercially feasible and marketable to general public. This research compares the energy consumption for single wall carbon nanotube anodes to potential energy savings in the use phase in Li-ion batteries.

An inventory of the laser vaporization process is performed at the NanoPower Laboratory and made into a process flow diagram. By categorizing consumable inputs and outputs of each phase a model is fashioned to yield energy consumption analysis from the lab data aided by SimaPro life cycle assessment software database. Following the comparison a sensitivity analysis, and testing of a SWCNT battery may further this work. By applying this model and integrating LCA the narrow scope of analysis will open causing people who shape the course of alternative energy development to avoid mandated policy that is detrimental to other industries, and designs requiring energy intensive manufacturing as those discovered in alternatives such as ethanol, that prevent society from leaping closer to the vision of decreased oil dependency.