Solar Tracker Design and Analysis

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If we could capture all the energy the sun beams to the Earth in a single hour, we would have enough to fuel the world's needs for a year. Currently, solar power produces less than one-tenth of one percent of global energy demand. It is well known that solar panels get the most sunlight energy when they are facing perpendicular to the sun, but since this happens only once during a day for stationary panels, the electrical output is not optimal. We investigated the question, “how can solar energy production be easily increased using today's technologies?” Our engineering design process focused on several design factors including reliability, efficiency, cost-effectiveness, and complexity of implementation. The engineering team achieved a novel and elegant design that effectively solves the problem of producing a reliable, low cost, and efficient single axis solar tracker that is easy to operate. We invented and produced a working prototype for a solar tracker that does not rely on complicated computer algorithms, or expensive computer processors. Data showed that the tracker increased solar power production by up to 178 percent over a stationary panel.

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