

Bio-Inspired Sun-Tracking Device

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Introduction

The target of development is to use a bio-inspired design approach, looking at nature's own mechanisms to come up with a simpler and more reliable way of tracking the sun. We find a non-electronic and mechanically simple sun-tracking device to be highly applicable in developing countries amongst others, driving greener development.

Theory

We will be using thermal expansion-theory and radiometry. And we will also be touching the field of fluid mechanics in our proceeding work.

Methods

The idea was first brought about in a biomimetic course focused on the solutions to problems already found in nature. In the development, we aimed at producing a working prototype as a proof of principle.

Results

The biggest environmental impact reduction, derived from our life cycle check, is in the usage phase of the product. The bio-inspired device uses zero amount of external energy to function! Compared to other sun tracking devices, we save 5.8% of the total output of the solar device from the zero energy use (Salsabila Ahmad, et al 2012). A bio inspired sun tracker implemented on a 6000w solar cell device, will save up to 7,9% of the energy consumption of a home of two average Danish persons. Furthermore a normal car mechanic will be able to repair the device and the most complicated parts can be made in a normal machine shop (turning, milling, welding etc.) and thus expanding the product life expectancy in undeveloped areas. Also easing the implementation of the device in such a part of the world considerably, facilitating a local power supply in third world countries.

References

Salsabila Ahmad et al. / Procedia Environmental Sciences 17 (2013) 494 – 502