

Solar tree



Solar tree in Gleisdorf, Austria

The **Solar Tree** blends art and solar energy technology in a sculptural expression. Solar trees are both artistic and functional clean energy machines. The term Solar Tree has been used to describe a variety of structures incorporating solar energy technology on a single pillar (like a tree trunk), and has become a generic term describing this category of aesthetic solar systems, within the larger realm of solar artwork.

1 Intent and Context

Solar trees are intended to bring visibility to solar technology and to enhance the landscape and architecture they complement, usually in a commercial or public context. An objective of many solar tree installations is to promote awareness, understanding, and adoption of renewable energy. They are not typically used as a primary source of energy for a property—that role is accomplished by rooftop solar systems. Solar trees are complementary to rooftop solar systems, or other green building measures, symbolizing these larger investments and their environmental benefit. People will try to make solar trees more

reliable and will try to make them gain more energy.

2 Benefits

Solar trees deliver the following benefits:

- Build awareness and interest in solar technology, thereby promoting its adoption
- Provide shade and a meeting places
- Differentiate properties, especially those with other hidden green building measures

3 Origin and Progress

Unique sculptural creations for a single sites began to appear in 1998 (e.g., the 7 kW tree in Gleisdorf, Austria) or earlier. A number of variants of solar trees have been conceived, not all of them realized in installations. Locations have included roadways, public areas in cities, schools and universities, office buildings, science museums, and more. Recently, designers and manufacturers have introduced solar trees as products, designed to deliver the benefits of solar trees in a repeatable way to more places. Examples include Ross Lovegrove's solar tree which incorporated seating, lighting, and circular groupings of photovoltaic cells, **Envision Solar** solar parking canopy specifically trademarked Solar Tree, and **Spotlight Solar**'s line of architectural structures.

4 Examples

Example 1: **Original Solar Tree Artworks**

A number of sculptural structures which incorporate solar photovoltaic cells have been erected. Gleisdorf, Austria hosts a tree with 7kW capacity and other solar sculptures, many less tree-ish. Tree-like solar structures have been commissioned for retail stores like **Halfmoon Outfitters**, and for towns like **Cherokee, NC**.

Example 2: **Ross Lovegrove's Solar Tree**



Ross Lovegrove Solar Tree on display.

Ross Lovegrove, a Welsh industrial designer known for his organic inspired designs, conceived an organic-looking solar structure with multiple curve stems and circular collections of photovoltaic cells. It was first manufactured by Artemide, a manufacturer of design differentiated products, based in Milan, Italy. In an effort to follow an environmentally conscious route, the company sought to incorporate solar power in their architectural designs.^[1]

Artemide defines the Solar Tree as “The successful marriage of the most advanced technology and the aesthetic requirements of the urban environment by way of renewable energy.”^[2]

Ross Lovegrove’s original design consisted of a sinuous tree constructed of steel pipes, measuring 5.5 meters, supporting a light bubble in which 38 solar cells, each with 38 watt capacity, connected to a hidden 12V battery system which lit an assortment of 1W LEDs at the tip. The solar cells for the project were commissioned by Sharp Solar.

How it works: The Solar Tree panels charge batteries during the day. At dusk the Solar Tree automatically switches on its LEDs. The internal control can also regulate the amount of

light produced depending on how much charge is left in the batteries.^[3] Artemide claims the Solar Tree will produce light for three consecutive overcast days.^[4] The designer Ross Lovegrove claims, “Solar Tree represents the DNA of our time and it also shows it is possible to create beautiful things using the most advanced technology.”^[5] In 2007 Lovegrove was awarded the Vogue Traveller Ecology Prize for his work with the Solar Tree.

Example 3: Spotlight Solar structures



Spotlight Solar product “Lift” at net-zero school in NC, Sandy Grove Middle School

In 2011, Spotlight Solar introduced a line of architectural products which customers refer to as solar trees. While sculptural, these are repeatable engineered products designed to place solar energy technology in high visibility locations in an attractive way. These structure have been used at green building sites such as the net-zero Sandy Grove Middle School^[6] and the St. Louis Rams’ headquarters^[7] to demonstrate environmental stewardship and to complement other sustainability measures.

5 Further interpretations

The Strawberry Tree, invented by the Serbian company Strawberry Energy, is a variation of the Solar Tree in that it is specifically designed to recharge mobile devices. The company won the Sustainable Energy Week 2011” competition for its revolutionary contribution.^[8]

There is a distinction to be made between organically inspired solar trees and structures which have been adopted to create energy efficient parking lots.^[9] Companies such as General Electric^[10] have installed solar panels in car parking lots to collect solar energy and protect vehicles from sun damage. These car sheltering solar devices differ from artistic Solar Trees in that they have no organic aesthetic. In contrast to the field of solar artwork, they would more appropriately be dubbed elevated solar panels.

6 The Solar Tree Foundation

Rein Triefeldt is a solar environmentalist artist that has also begun to construct solar trees. He is one of the founders and the current president of the Solar Tree Foundation which began in 2008.^[11]

The Solar Tree Foundation designs programs for elementary school students to show them the creative process for constructing a Solar Tree in order to educate a broad audience on the environmental and technological material. It's also designed with the intention of instilling an appreciation for artistic aesthetics interpreted through sculptures as a medium of expression. This is performed by online lectures and webcams in which the students can engage with the architects and see the construction process in real time.^[12] Triefeldt believes that his Solar Trees will help preserve natural trees in the long run.

The latest solar tree constructed by the Solar Tree Foundation was erected for North Hillsborough Elementary School in Hillsborough California. At peak efficiency, the 10,000 lb Solar Tree is claimed to produce 20,000 watts of energy per day.^[13]

7 References

- [1] Artemide. . N.p.. Web. 20 Feb 2013. Artemide Events Page.
- [2] Artemide. . N.p.. Web. 20 Feb 2013. Artemide Events Page.
- [3] Design Boom May 26, 2012 Article on LoveGrove and solar trees
- [4] Solar Tree. Artemide. N.p.. Web. 20 Feb 2013. Artemide Brochure.
- [5] Artemide . N.p.. Web. 20 Feb 2013. Artemide on Love-Grove.
- [6] PR Web, announcement of Sandy Grove Middle School project completion.
- [7] SolarWorld Article on the Rams' solar projects
- [8] strawberry tree (The Solar Energy Device)
- [9] Clean Technica Feb 21, 2013 Clean Technica
- [10] Clean Technica May 30, 2011 General Electric goes solar
- [11] Rein Triefeldt. Princeton Green. N.p.. Web. 20 Feb 2013. On Rein Triefeldt.
- [12] Projects. Solar Tree Foundation. N.p.. Web. 20 Feb 2013. Solar Tree Foundation Projects.
- [13] Solar Tree Foundation accessed: Feb 20, 2013 Solar Tree Foundation site

8 External links

- Solar Tree, designed by Ross Lovegrove
- Solar Tree Demonstrates That Green Can Be Gorgeous (VIDEO)
- Solar Tree Foundation
- Strawberry Tree - world's first public solar charger for mobile devices
- Spotlight Solar

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