



CITATION

for Sustainable Design

Terra—The Sustainability Pavilion

Dubai, United Arab Emirates

Buro Happold

Chris Coulter, Gabe Guilliams, and Jenny Werbell



“The fusion of solar power technology with the shading of its striking ‘tree-like’ canopy structures gave clearly defined purpose to all the engineered design elements. Natural outdoor light for a power-generation strategy and shading cleverly reduce energy needs for cooling co-located spaces and additional lighting is reservedly employed only where and when needed, with responsive controls.”

—Carrie Meadows, *LEDs Magazine*
2022 Lumen Awards Judge

The Dubai Expo featured pavilions from 192 nations, each demonstrating native, cutting-edge technologies. The three anchor pavilions bring focus to a critical global societal issue: Mobility, Opportunity, and Sustainability. At the Sustainability Pavilion, nature meets technology.

The site hosts photovoltaic "trees" and an imposing photovoltaic canopy rises over the exhibition hall. Buro Happold and the Grimshaw team studied daylight conditions throughout the year, establishing the optimal density and scale of the energy trees. They dynamically track the sun's location, constantly rotating throughout the day to maximize insolation and the resulting shade below.

After sunset the energy trees reset, orienting themselves as reflectors providing a base layer of indirect illumination below, while eliminating the need for traditional pathway illumination. As visitors move deeper within the site, episodically illuminated native vegetation surrounds the pathways, adding visual richness at a personal scale.

At the site's center, the largest of the solar canopies reveals itself. Visually comfortable, integrated uplight enhances the massive structural cantilever while simultaneously activating the plaza below. The project achieved LEED Platinum certification, with the lighting using approximately two-thirds of the allowable density. The post-Expo plan is to convert this visionary ecosystem to an integrated mixed-use community.

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