

OASIS: Design Concept

Oasis is a holistic environmental installation that combines natural and human elements to create a self-sustaining habitat of desert flora and fauna connected to the ecology and the inhabitants of Masdar City. The design goes beyond the dry monumental and its functional role as energy generator and becomes a catalyst for the residents of Masdar City to engage their environment and ecology, and that of Abu Dhabi at large.

The design uses solar cells mounted on conical structures (nests) that shade sunken habitats within each nest. The four solar cones contain within them a variety of responses to the environment and ecology of Masdar City, ranging from vegetated habitats for birds, desert shrubs and trees, a water cooled gathering area for the human residents and a ground water recharging step well that addresses the decline of ground water levels in UAE. Beyond its functional role, the arrangement of the solar cells and its apertures are derived from the Islamic carved stone screen patterns (jaalis) of traditional architecture, making a high tech connection with a historical precedent of the region.

The form of the landscape, with its earthen mounds and conical solar cells, evokes the dunes of the desert- while the holistic ecological operation of the environment evokes the self sustaining nature of an oasis. The solar cones and the earthen mounds complement each other at a formal level. Just as the solar mounds represent the technological achievement of humans, the earthen mounds represent the an equal cohabitation of the built space by the natural landscape and its native ecology.

A techno-ecological oasis uses energy generated by the solar panels to recycle grey water which is then used to create a shaded landscape of drought resistant shrubs and trees as well as contain a step well to recharge the depleting ground water in UAE. The holistic design uses the various components to accommodate the natural systems that has historically been part of the site before the development of Masdar. The design uses energy generated by the solar panels to recycle grey water. This water is then used to nurture a shaded landscape of drought resistant shrubs and trees. In addition one of the cones contains a step well that recharges the depleting ground water in UAE.

Nameplate Capacity and Annual Capacity

Total surface area of solar panels: **9000 sq.m.**

Total Generating wattage **1800 kW**

If, 1sqm (1m x 1m). Solar panel produces 200 W

Then, 9000 sqm x 200 W= 1,800,000 W = 1800 kW

Annual Capacity **2,838,240 kWh**

1,800 kW x 8760 hrs x 0.18 = 2,838,240 kWh

Order Of Magnitude Conceptual Cost Estimate

Installation Budget **\$ 36 million**

1,800,000 W x \$20= \$ 36,000,000

Solar Panel Cost **\$ 5.4 million**

1,800,000 W x \$3 = \$ 5,400,000

Sculpture and site cost **\$ 30.6 million**

1,800,000 W x \$17 = \$ 30,600,000

Materials List

1. Monocrystalline Solar Cells
2. Steel tube Diagrid Structure
3. Sandstone steps for step well (locally sourced)
4. Permeable Stone Paving
5. Water cooling Tubes

Environmental Impact Statement

The design uses energy generated by the solar panels to recycle grey water which is then used to create a shaded landscape of drought resistant shrubs and trees as well as contain a step well to recharge the depleting ground water in UAE. The shape of the depressions under the solar cones collects ground water and reduces wastage to the drainage system. The project causes minimal disruption to the site by creating earthen mounds in order to minimize earth moving during construction. All the vegetation used in the landscaping is drought resistant and comprise of native species such as the Acacia tree and desert shrubs.

A core value of the project is to minimize disruption to the existing environment and it attains that goal by integrating within the design the coastal ecology of Abu Dhabi with its arid flora and bird fauna. The cooling mist that cools the areas under the solar cones is generated from recycled grey water from Masdar City, making the design water independent. The holistic design uses the various components to accommodate the natural systems that has historically been part of the site before the development of Masdar.

The power generation capacity of 2,838,240 kWh is far in excess of the lighting needs of the project and will be used to supply power to Masdar City and the Abu Dhabi grid and the project will be net-positive generator of electrical energy. Beyond its generation of electricity, the project harmonizes the cultural role of landscape in connecting humans with their environment and making their connection meaningful and enriching.