

DESERT TRINITY

Renewable Oasis

Desert Trinity represents the three parabolic elements of this project; two solar elements and one wind element that works synergistically to provide a clean and sustainable source of energy. The two concentrated solar paraboloids (solar elements) harness solar energy and the one paraboloid (wind element) comprised of helical shaped vertical axis wind turbines (HWT) harness wind energy. The elements have a diameter of 35m each. The weight of the parabolic structure is supported by a concrete pylon in the shape of a hand, which is a representation of the hand of Gaia, the Goddess of the Earth in Greek Mythology.



Land Use Intensities for different CSP Technologies

ENTRANCE PORTAL

The arched entrance portal serves as the gateway to Masdar and opens up into the heart of the Desert Trinity to experience the energy park of the future.

LOW CARBON CONCRETE

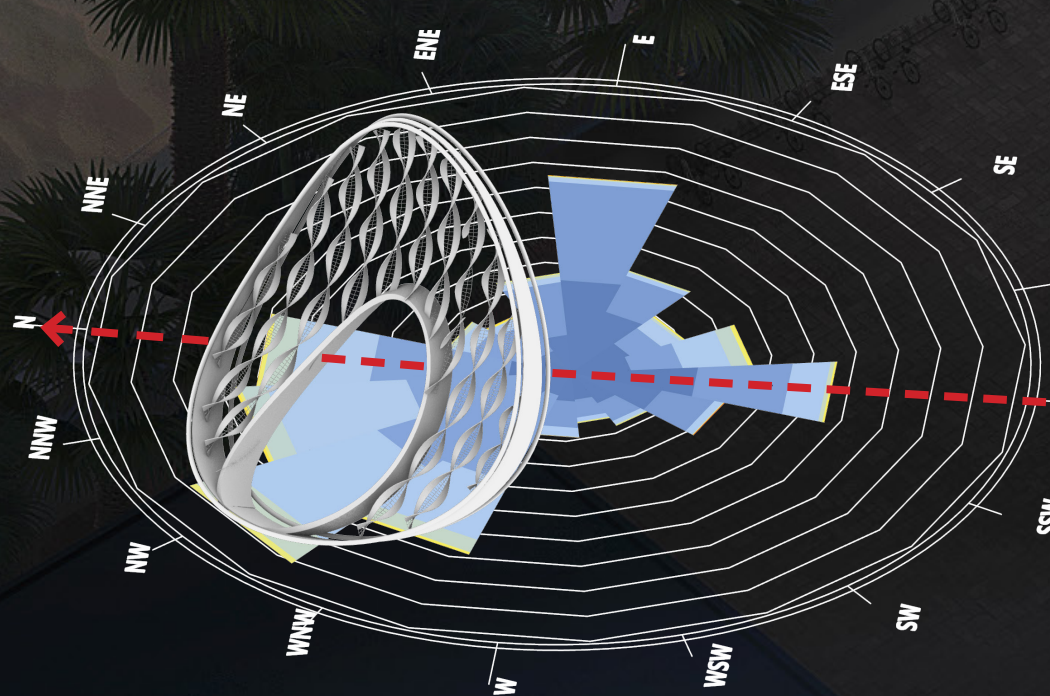
Local Dune Sand with high clay content is used for the plastering the parabolic inner shell of the solar elements creating an interactive sculptural wall inscribed with cultural artworks.

HAND OF GAIA

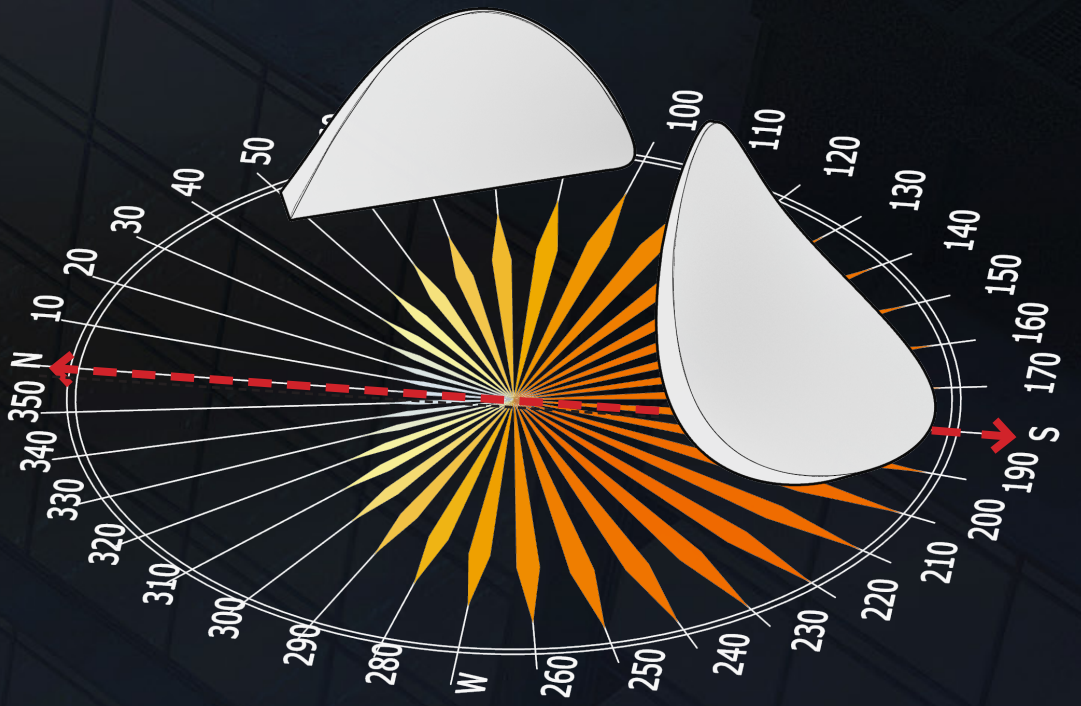
The hand of Gaia stands as the structural support for the desert trinity.

PIEZOELECTRIC TILES

The piezoelectric sensors have been integrated with the pedestrian bridge that leading to Desert Trinity which generates electricity through the force exerted by the public footfall.



Annual Wind Rose for Abu Dhabi (m/s)



Annual Radiation Rose for Abu Dhabi (KWH/m²)

The concentrated solar elements harvest sunlight to make thermal energy from a strategically designed curved mirror surface onto a centrally focussed collector. CSP remains a land intensive resource. A benefit of vertical design is that it can take advantage of the wind and at the same time facilitates land use for prime agriculture more effectively than urban sprawl. Desert Trinity's solar element is a membrane-based solution that can be inflated and deflated making installation and transportation easy, so that it can be erected in an alternate location.

The geographic location of Masdar has high annual solar irradiance (0.265 KW/sqm) with an average annual sunlight of 10 hours per day, making concentrated solar power an attractive solution. Optimum orientations have been considered (South from East to West) when placing the solar parabolas on the site to capture the maximum solar power. The wind parabola consisting of HWT's has been oriented towards North West, to take advantage of the prevailing winds that blow with an average wind speed of 5.4 m/s.