Solar Aves Park

Introduction

With Middle East hot desert climate, the project was abundant in harvesting radiant light and heat from the sun. Active solar techniques include the use of photovoltaic systems. Solar Aves Park, ensembles the force and courage, recognizing the importance of falconry in Arab tradition and culture. It features landmark where it mimics a falcon bird as its welcome sculpture and at center of amphitheater.

Solar Aves Park

Park development comprises three sections: The Amphitheater, The link Bridge and the Sunken Garden. Main access to the site will be on foot through an elevated pathway featuring an electromagnetic pavement converting footstep into energy and data.
The Park accommodates to around 500 – 1000 visitors on peak and this allows them to experience an advance technology on data, science and energy suitability. Cafes, seating lounges, business symposium will be catered through its commercial and amenities spaces provision.
This would be an interactive recreational landmark where it showcases innovative energy production through infrastructure architecture.

1. Flacon landmark with adaptive sun tracking pv s on its wings
2. A Solar Palm PV Tree structure with pvs on its palm leaflike combined with vibration resonant wind generator
3. Electromagnetic pavement system

Energy Integrated Architecture

The Falcon- The use of flexible thin-film photovoltaic modules provides fluid integration with carbon fiber profiles as motorized tracking fins oriented towards sun's path depicting falcons' wing feature. Orienting its fins to the sun will be more effective in Sunlight capture.

The Solar Palm Tree – A vibration resonant wind generator as its additional feature for pv modules on its palm leaf profile. It harnesses wind energy from a phenomenon of vorticity as it leafs profile oscillates on wind range, which then generates electricity through an alternator system. In other words, it is a wind turbine which is not actually a turbine. The leaf like profiles designed to be largely rigid and has the ability to vibrate, remaining anchored to the bottom rod. The top of the leaf is unconstrained and has the maximum amplitude of the oscillation. The structure is built using resins reinforced with carbon and/or glass fiber, materials used in conventional wind turbine blades. Attached on its leaf is flexible thin-film photovoltaic modules which then converts into energy.

The Electromagnetic Pavement-As the pedestrian walk across the pavement system, the weight from their footstep compresses electromagnetic generators below, producing 2 to 4 joules of off-grid electrical energy per step. Low power Bluetooth connect to smartphone apps and the system can also communicate with building energy system.

Power output Solar Panels = 4,857 sq.m area coverage X 1000 watts per sq.m 4,857,00 x 0.20 (20% efficiency per 1 sq.m panel)
=971,400 x 5 hours of sun = 4,857,000 watts per day

Power output Pavegen (Electromagnetic Pavement) = 8,564 sq.m area coverage (@ 40% site walkable surface). 2,141,000 watts per day.