**THE DHOW PARK**

The Dhow park is a concept of art that generate both energy and water in a cultural sustainable form of traditional Emirati heritage.

* **CONCEPT STATEMENT**The concept is inspired from traditional Emirati Culture boats (Dhow)Dhow (Pronounced as “dāwa” or Marathi "dāw") is the generic name of a number of traditional Emirati sailing vessels with one or more masts with settee or sometimes lateen sails, used in the Indian Ocean region. Typically sporting long thin hulls, dhows are trading vessels primarily used to carry heavy items, such as fruit, fresh water, or other heavy merchandise, along the coasts of Eastern Arabia. Larger dhows have crews of approximately thirty, smaller ones typically around twelve.
* **TECHNOLOGY USED IN DESIGN**
* **1.RENEWABLE ENERGY TECHNOLOGY**

The used technology is a hybrid system composed of: Piezo-electric system used in the ground units mimicking the DHOW sailing boats in addition to the Skysail kites mimicking flocks of birds flying above the coastal areas in Emirates.1st Source: Ground unit of Piezoelectric Motors, they generate electricity through the continuous fluctuations of generated by wind on the vertical rods of the sail system2nd Source: Sky unit of Skysails TM of GmbH & Co. KG is a Hamburg-based company that sells kite rigs that generates energy by wind energy.

* **2.CULTURAL SUTAINABILITY**

Cultural sustainability represented in visualizing a traditional Emirati heritage as it relates to sustainable development (to sustainability), has to do with the maintaining of Emirati craftsmanship of traditional sailing boats, as its own entity, and attempts to sustain that culture in the context of the future to younger generations. This concept has been intertwined within renewable energy and water gathering domains, and as such, have become one of the more important concepts of sustainability.

* **3.CLEAN AND FREE WATER HARNESSING**

The same ground sails used for energy generation are used as Fog netsThey gather water from fog using the large pieces of vertical canvas to make the fog-droplets flow down towards a trough below the canvas, known as a fog fence.Through a process known as condensation, atmospheric water vapor from the air naturally condenses on cold surfaces into droplets of liquid water known as dew. In Emirates the rate of fog enables to gather approximately 5 gallons from each unit as the atmospheric moisture condenses at a rate greater than that of which it can evaporate, resulting in the formation of water droplets.

The Site plan lines were inspired by the coast sea lines to complete the visual image of the Dhow sail boats. It is intended to provide the park visitors with a complete experience and interaction with the Emirati traditional culture in a new abstract art approach.

* **DIMENSIONS, LIST OF THE PRIMARY MATERIALS & COST ESTIMATE**
1. The ground Dhow unit:

It will be a 10 meters high structure to harness wind magnitude effectively. The list of materials are composed of: ETFE tensile fabric of 10 sq. meter, flexible anti-rust steel rods carrying the fabric and acting as alternator, An electric generator and a Concrete ground tank lined with high density polyethylene lining to store water.

The rough cost of one unit is around 11000 $

The total expected cost is 1100 x 21 unit =23,1000 $

1. The sky sail Bird kite:

**SkySails GmbH & Co. KG** is a Hamburg-based company that sells kite rigs to propel cargo ships, large yachts and fishing vessels by wind energy.

The Skysails propulsion system consists of a large foil kite, an electronic control system for the kite, and an automatic system to retract the kite.

Other companies, such as California-based KiteShip, have built similar technology.

The rough cost of one unit is around 16000 $

The total expected cost is 1600 x 7 unit =11,2000 $

1. Landscape works

28718 sq meter x 500$ = 14359000 $

The total cost per watt will be 9.75 $

* **THE BASIC ENERGY AND WATER CALCULATIONS** Energy Technologies: piezoelectric linear alternator, Skysail (TM)Annual generated energy: 15,074.5 MWh Annual harnessed water: 12,775 Gallon
* **BREAK DOWN OF ENERGY CALCULATIONS1.FIRST THE ENERGY CALCULATIONS**1.The ground DHOW unit can generate 1.2 MWH per day2.The sky unit represented in the Origami bird kite can generate 2.3 MWH per day(21 Dhow unit x 1.2 MWH x 365) + (7 Skysail kite x 2.3 MWH x 365) =15,074.5 MWH per year**2.SECOND THE FOG WATER HARNESSING**The DHOW ground units accordingly to the surface area of its fabric will have the capacity to harness 5 gallons per day on an average basis, 21-unit x 5 gallons x 365 day = 12,775 gallons per year
* **ENVIRONMENTAL IMPACT SUMMARY**
* The main approach of the presented design is a multi-aspect design, Same Dhow unit can generate free renewable energy and harness clean free water due to the high dew and humidity rates in Emirates, The proposed design should provide the surrounding are with clean water that should be used in increasing the green area. The recommended kind of trees to be planted are date palm trees that can withstand the high temperature rates and don’t block the wind from the Dhow units. And on the other hand, provide us with dates and due to their high heights should increase the shaded area in the park for the park visitors.
* The sky sail kites also should act as a landmark for the visitors and indicator of the wind strength and direction for various needs from marine to weather forecasting.

SkySail kite propulsion from upper wind power is a traction use of high altitude wind power. Up to 100 million tons of carbon emissions every year could be saved by widespread use of SkySails technology, according to the International Maritime Organization.