SEA OF SOLAR

Sea of solar is a landscape intervention. A stage for solar technologies. A solar canopy to gather and stay. An immersive artwork for the public and the society to engage with clima, light, atmosphere, movement and time.

A HAPPY SOCIETY

Our Sea of ​​Solar sculpture creates a distinctive, attractive and fascinating place for the people of Masdar, Abu Dhabi and the Emirates. The sculpture is understandable, experienceable, accessible and usable. It allows people happy moments for contacts, feelings and interactions. It brings friends, families and neighborhoods together for leisure, parties, concerts, sports and games.

Almost by the way, it also generates electricity for light and a pleasant climate. Without any burden on the environment and without disadvantages for future generations.

AIR, LIGHT AND TIME

During the day, the panels lightly swing near almost-closed position, projecting vibrating patterned shadows of blue light. The fresh microclimate gained during the night is kept while visitors experience a visually immersive and pleasing bath, like under a sea of solars.

At night, cool sea breeze pushes panels toward open position to night sky, allowing air flow to enter the canopy and releasing hot air accumulated during the day. The artwork produces a lighting scene where each panel will keep changing light intensity according to turbulences intensity near ground. This luminous waving sea acts as an iconic spectacle both seen from above and underneath.

TECHNOLOGY

Standardized solar panels with clear EVA, standard cells and built-in OLED thin-film technology, balancing on tensed steal wires.

As the wind breeze trough the canopy the panels are brought to swing, while piezoelectric generators produce electricity from the pressure exerted on the joints, powering OLED luminescent films during the night.

A geothermal Pump system pumps water from the underground at steady 27°C, cooling down in sommer and eating in winter, for a pleasant micro-climat all-year long.

ENVIRONMENTAL IMPACT STATEMENT

The artwork acts responsive to environment and night-day cycle by solely use of main wind forces. This performative canopy generates optimal sheltering conditions without necessity of further technologic or energetic resources waste.

It promotes social exchange and physical well being by offering quality outdoor recreational space within Masdar City.

His modular standardized character allows easy handling while solar PV can be easily repaired, upgraded or substituted with more efficient ones as technologic advances occurs.

The installation can also be used to test and display emergent PV technologies, giving a testing ground and visibility platform to new experimentations in solar technologies.

CONCEPTUAL COSTS ESTIMATE

Total Budget: 928'125 W x 20 $/W = 18'562'500 $

Cost of Panels (incl. OLED films and piexoelectric generators):

aprox 4 $/W for panel (incl. OLED film) x 928'125 W = 3'712'500 $

Travertino paving: 1'750'000 $

Hearthwork and reinforced concrete Structure : 6'250'000 $

Steel wire ropes: 2'250'000 $

Geothermal Pump installation: 2'550'000 $

Engeneering, Work: 2‘000'000 $

Total Costs estimate: 18'512'500 $

TOTAL NAMEPLATE CAPACITY

3'375 x 275 W = 928.125 kWp

\*Reference model is the 275W AS-6M30 transparent, (Efficiency 16.6% at STC), by Amerisolar

ESTIMATED ENERGY PRODUCTION

Area (m2) x Efficiency x Peak Sun Hours x Effective Output % After Deducting Losses x 365 day= Output (kWh/year)

\*Peak sun hours is defined by “the equivalent number of hours per day when solar irradiance averages 1000 w/m2”.

\*The yearly average peak sun hours/day used in calculations for the UAE is 5.84.

\*Losses are expected to account for 25% of a PV panel’s output in the UAE and therefore 75% of the theoretical output will be the yield of the system.

3'375 x 1.63 m2 x 0.166 (16.60%) x 5.84 x 0.75 (75%) x 365 =1'459'944 kWh annual