INTRODUCTION

The idea for the land art Green Energy Tower of Masdar, is to express high human aspiration of a sustainable future, Co2 neutrality and a green symbolic tower that produces more renewable energy than it consumes, to share and connect with neighbors of Masdar.

We want to create a green botanical oasis in the middle of the desert, that allows everyone to walk up via ramps, from their ordinary daily living, enable to get new perspectives and stunning views towards the city, harbor, and spirituality since the orientation of the ramps are in the direction towards Mecca. the Green tower will encapsulate rare species, botanic and butterflies.

We elevate vertical tower of 34 meters height, solid anchored in the ground reaching up to the drifting sky - man moves in between, up and down via ramps that rise by 7.5%. (The airport near by demands a maximum height of 45 meters.)

We expose half the façade plus the roof surface to sunlight to boost solar energy, warm solar rays from Southeast, South, Southwest and West. A closed PV structure complementarity to the open Northern and Eastern side of the facade. The roof construction is bottle green steel as the PV’ in RAL 6007 and 4 thin vertical paraffin intersection, which collect solar Energy from the outside in daytime and return energy in the evening to the inside.

The 8 angled plan and tower is inspired by Islamic culture & Architecture like the Dome of the rock in Jerusalem, the great mosque of Samarra, minaret of Buchara and the Chinese taoistic bagua, and traditional functions of wind- and sun towers plus a newly built tower in Gisselfeldt Denmark - all in psychical and mental balance with nature.

The construction is based on circular economy principles and a productive cycle of the 5 Fung Shui elements. Wood/ bamboo, Fire/ PV, Earth, Metal, and Water.

In the future the tower can be separated in destructive cycles: Wood/ bamboo, Earth, Water, Fire, Metal.

Visitors will, via the curved ramp, be able to move up and down the tower and come close to butterflies and beautiful green landscaping. The aim is to make visitors aware of the significant impact nature has, not only on our climate, but also on our mental health so we can live in balance with each other on the earth. We created a green calm and silent space, where people can use it for praying, meditation or just to take a break from the busy life that surrounds the city, and come up and watch the sunset, sunrise or the seascape. The ramps are generous in width, to accommodate easy passage up and down also in a busy season. The visitors will, via their movements up and down, add to the sustainability aspect in which their footprint and movement in the building will be registered and absorbed, to generate kinetic energy that can be utilized in the total energy account.

A botanical oasis, with rare plants, flowers, that can grow optimally because of the weather conditions in Abu Dhabi, with Butterflies all around.

Health and exercise - the statistics show high rates of obesity and health issues in Abu Dhabi and continuing to grow he upcoming years. To battle this, we need to create more public spaces that encourages play and movement. The ramps encourage people to move further up, where they will be rewarded with fantastic views and be able to come closer to nature. It is important to reintroduce the value of experience through movement - it is here were we meet new people, exchange experiences and add quality to the community by becoming more intimate with one another.

MAIN STRUCTURE FRAME

Outer shell/ facade – concrete wall glass+ aluminium rails to mount solar panels

Inner shell - Cross timber beams and coloumns – a natural ventilation shaft of 40 mm in between the two walls, cool the solar cells and make a nice inner climate, vind towers are wellknown. In the middle east.

Acoustic panels put on 2 of the 4 concrete walls with vertical bamboo lines.

3 layers of float glass like Pilkington selfcleaning active glass supported by stainless steel

Ramps - Bamboo ramp and Bamboo railing 7,5% rising degree. Led light below and integrated in the hand rail.

ENERGY STRUCTURE & CAPACITY

580 Photo Voltaic panels: 476 SUNERG PV X Color panels x 270 wp Total: 128,52 kWp on 4 façade parts ad 104 roof transparent PV panels x 200 wp – installed effect 20,80 kWp. All together: 149,32 kWp.

PV Generator surface: 944 m2. Annual production164.790 kWh.

Co2 emission reduction / savings 989.833 Kg/ annually

In the bottom of the wall below the PV panels are small ventilation openings that allow the wind to cool the PV panels with openings openings up along the round ramp and in the top to remove heat on the backside of PV panels and increase the production effect and change the air to improve the interior climate.

It is the principel of the Russian Leningrad window, Winter Palace – based on a chimney effect without any aiding ventilators that use electricity

8 x 15 KW + 1 x 20 KW Fronius inverters chance DC current to AC current, with 5 datamanagers so the energy production can be followed on mobilphones and computers and for maintance purpose.

A sun radiation meter on the roof+ a sensor box inside makes it possibel to measure the annual sun radiation and compare it to metrological institute information

5 KW/ 300 KW Vanadium flow Battery in the basement, to store electric energy during the daytime, so it can be used at night in the tower for LED and the city and parked electrical vehicles nearby. An alternative could be at salt water battery, to be considered in a further process.

FOTO 1. PARAFFIN GLASSWALL

Paraffin glasswall – 4 vertical sections of 34 m2 (1 meter width x 34 meter height ) 136 m2

The solar wall construction is developed with a special latent-heating storage with paraffin, as PCM (Phase Change material). More thermal possibilities are integrated.

Transparent insulation, absorber for heating storage and protection against overheating.

Construction through the solar wall.

The sunwall makes storage of heat. The construction is called powerglass. The next layer consist of sun covering prism glass. It reflects the sun radiation, as soon as the sun gets higher than 40 Degrees over the horizon.

The built-up from the outside:

6 mm. cover layer of security glass with low energy cover.

29 mm room filled with Argon

5 mm. prisme – glass – plexiglass

6 mm glass withour any cover.

12 mm Argon

6 mm. glass with low energy layer

42 mm with paraffin in artificial casette

6 mm. glass on the inside- Can be with silkprint made color.

4 thin vertical walls of 1 meter x 34 meters of paraffin glas can absorbe sun heat, give internal green diffuse light and in the cold evening, give the sun energy back to the internal oasis for human comfort and the plants.



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