**Project and concept description**

In the contemporaneous times, the world seems to shrink, cities are emerging at an accelerated pace, the population is proliferating, with problems arising of shortages and overexploitation of resources that have no previous reference. These global problems, impact at the local level, regardless of latitudes or climates. Future imaginaries are becoming increasingly hostile, therefore, it is important not to be oblivious on stage, and act collectively to safeguard the planet's natural, human and economic resources

This globalization has generated a homogeneous planet, whose impact on ecosystems is undeniable. The example of cities like Masdar, with this vision of a sustainable city that emerges from scratch, reducing its negative impacts, allows us to discuss the importance of developing infrastructure that goes beyond the basics, of an infrastructure whose limits are diffuse with art. , design and sustainability science.

The proposal "Lux.On" is presented, whose main axis is consolidated in the use of the conditions and resources (natural, human and economic) coming from the context of a pioneer city such as Masdar.

This prototype, takes up the technology of the Solar Towers, air turbines and photovoltaic cells in order to integrate them into a vision of landar where, from the understanding of the local landscape, a structure that emulates the dunes of a unique desert of the Emirates is shown, to take advantage of the great solar incidence and the sense of wind. Emerging thus, a hybrid structure with strong sculptural values, and utilitarian spaces determined by its aesthetics and architecture

The project will be an oasis within a monotonous urban landscape like the Masdar. A common area of ​​recreation whose possibilities of use will be flexible to multiple programs. Where art brings a sense of identity and belonging to the site, and its visitors. Likewise, it generates a useful infrastructure in the production of electricity, and an important urban meeting point.

The project reflects on the importance of unifying a humanity, a conscious humanity and responsibly linked with the context, to avoid damaging society and the environment.

**Engineering Design**

The land art project involves the combination of passive techniques for the use of solar energy and active energy generation systems:

1. Mud brick walls – Insolation and termal mass
2. Solar updraft tower- Energy production system
3. Photovoltaic cells- Energy production system

*Passive system*

*•Mud brick walls*

Due to the climatic conditions of the city, it is necessary to create ventilation and cooling passive systems that control the heat generated by solar radiation and then help reduce the temperature of public space.. The mud bick wall, which begins at a ground level and reaches 20 meters, captures the thermal energy of direct sunlight, allowing passive cooling of the area and in addition, stores the heat of this energy to be released in the cold nights of the desert. This type of system known as thermal mass causes a design between the contributions of heat and the increase in temperature.

The alleys formed by the mud brick wall refer to the interaction of wind in the sand of the dunes, in technical form, these intersections help to increase the speed of the wind that must arrive to the turbines under the chimney. These walls are characterized by their low cost production and maintenance so, wich optimizes the performance and economic benefit of the project. Furthermore, they do not emit greenhouse gases during their operation.

*Active system*

Every hour, the sun throws more energy on Earth in the form of light and heat, enough to meet the global needs of a full year. It is estimated that in a year of absorption of solar energy on Earth is equivalent to 20 times the total reserves of fossil fuels.

"In the span of six hours the deserts receive more energy from the sun than anything humanity consumes in a year." Gerhard Knies. In this way, the project encourages the use of this technology, recognizing the potential of both photovoltaic and solar thermal energy in the city, which is located within the region known as "Sunbelt"

*•Solar updraft tower*

A solar tower is a construction that tries to take advantage of solar energy by convecting air. The tower consists of a 80m chimney painted black at inside that absorbs the solar energy and hot air that is inside it. A membrane composed of ETFE (Ethylene Tetrafluoroethylene), plastic resistant to high corrosion and high temperatures it is located in the lower part of the tower is by which the solar energy that heats the air below it is collected, leaving a difference in temperatures with the outside air. As a result of this convection, the hot air goes up the tower creating an air flow that moves the air turbines under the tower to produce energy.

*•Photovoltaic cells*

Thanks to the photovoltaic effect the cells will generate electricity that will then be stored in transformers that are, for the safety of the visitors, in the adobe walls. The proposal for the introduction of this type of technology is based on the use of thin film solar cells that are found on the surface of the walls and roofs in a total area of 8,500 m

**Amount of Energy produced:**

**Solar updraft tower**

Each tower: 96,000kWh/day. =35,040Mwh/year  
4 towers: 140,160 Mwh/year

**Photovoltaic cells**

8,500m2  with a 5,168 kWh/day= 1,886.32 Mwh/year

**Environmental Impact Statement**

From the perspective of power generation, this land art project can be considered as a low carbon emission project, due to the use of clean technologies such as: solar towers of convective air, air turbines and photovoltaic cells that pose an active technology system that manages not to produce any type of pollution that affects the environment. In addition, a passive technology is present at the project. This emerge, as a result of using natural resources with greater presence and capacity on the site: sun, wind and soil.

The art project evokes the use of resources and their integration with the context, so the choice was made to use natural materials and reuse that are not only found, but also produced sustainably on the site.

The added value of the project is the use of mud bricks that not only refer to the history and culture of the United Arab Emirates, but show respect for the environment and reflect the principle of sustainability on which Masdar is built. This type of material also shows economic and environmental characteristics of sustainable production. Bearing in mind that the prime material of this form of construction is the soil, we can also understand it as being a product of low economic cost since it is commonly found in the surrounding nature of the space to be built, which would reduce the final production cost and the impact of carbon footprint by transportation.

Even for steel used in the main structure of the solar tower, the use of waste and recycled material is contemplated. In this way, the carbon footprint impact is reduced due to the production of this material

**Materials**

•Steel (estructure and tower cover)

•Mud brick

•Concrete

• ETFE (Ethylene Tetrafluoroethylene) plastic

• Thin film solar cells (Amorphous silicon (α-Si)CdTeCIGS)

•Vegetal material