wind | bâdgir | brick | sun | kite

…in the middle of the city there is a piece of desert

that you can not reject

between the dunes: a cemetery

where the children play

and where they fly with the kite…

…in the middle of the city there is a shadow of the desert

that you can not see

between the dunes a moon

where the children sleep

and where they dream about spaceships…

It is not true that a desert is desert.

Sight, hearing and touch are the invisible rich senses hidden in it, that many times are lost in the overwhelming intensity of the natural elements. These elements, on a well sculpted scenario, are filtered and soften to our senses:

The beauty of an ancient and technological structure and the flying kites in the blue sky, that takes the eyes to the infinity and to our infinity power source, the Sun.

The cool breeze that touches the skin refreshing and alleviating the body from the natural heat.

The subtle sound of the wind that passes through ancient pipes creating natural calming music.

These senses take the mind into a state of contemplation and peace, where one can relate to the surrounding nature and think how we, as humans, relate to our planet.

**Text | 1**

The wind | bâdgir | brick | sun | kite project is a sculptural structure composed of a serie of windtowers and sculptural kites that creates beauty, contemplation, shade, sound, passive air cooling and solar power energy. A sidewalk that passes along the towers and kites makes way for people to stroll and sit by the shade, hear and feel the fresh air channeled through the air system tubes, creating a space of contemplation and relaxation, bringing the eyes and imagination up to the sky, with the sensation that one could be flying with the kites. Besides the beauty, the sculpture also produces electricity for the city with the organic photovoltaic (OPV) panels that involve the towers and the kites. At night, the sculpture also generates beauty by lighting up the towers and the kites.

Seventeen wind towers comprise the sculpture’s main structure, made of a reticular structure and interlocking bricks covered with organic photovoltaic (OPV) panels. As a Middle Eastern ancient traditional technology, the wind towers can be easily constructed by local construction companies lessening estimated costs and carbon footprint. The interlocking bricks can also be produced locally, following the idea of reducing the carbon footprint by using local sources and promoting local development by generating work for local population. Using interlocking bricks assembled in a reticular structure frame reduces the use of cement and/or other types of bonding materials to a minimal, reducing the waste produced by construction. And also, if needed, this structure can be disassembled and all its components reused or recycled. Metallic kite lines will be attached at the towers air tube exits that open up to a sidewalk. The kites are made of a metallic structure with the application of OPV panels moulded into its shape; stabilized sand is used for the sidewalks in order to reduce the use of cement or other construction materials.

The organic photovoltaic panels cover both the towers and the kites producing clean energy that can be fed into Masdar’s power grid to provide electricity to the city and to light up the sculpture at night. The height of the towers varies from 55 up to 120 meters (180 up to 394 feet), to optimize the catching of the wind in different directions and heights during day, which will also bring different perceptions for those strolling by the sculpture, as the breeze exits from different pipes and at different places. The control panels and distribution center will be placed underground so that it doesn’t risk people’s safety; doesn’t interfere with the sculpture’s aesthetic and also protects the system from overheating.

With a 35000 square meters (376.736 square feet) of possible OPV panel installation area, the system will be able to annually produce about 2500 kWh in average. The design site is about 30.000 m² (322.917 sq.ft), in which the wind towers will be constructed providing a possible OPV panel installation area of 30.000 to 40.000 m² (322.917 to 430.556 sq.ft); the OVP output ranges from 30 to 60 watt/m², depending on where and in what angle the panel is installed; on average, our project will produce a minimum of 800.000 W/h up to 1.200.000 W/h. The panel production and installation costs varies from US$5 to US$8 per watt installed. Therefore, the cost of the structure will be US$10 per watt produced, it is possible that US$2 per watt produced will be used for more research and development of the project.

The design of the sculpture is made so as to permit future use of the rest of the area as a park or whatever the city makes of it, as we believe that spaces are naturally occupied and defined by usage as the city changes and evolves. Sometimes, a more loose planning brings a positive entropy, letting the city take on and create a life of its own, as the excess of planning takes away the spontaneity of the use of the space, rendering it quite aseptic and crystalizes the space in time. We deal with pieces of the city as if it were pieces of landscape with architectural instruments and refinement to render the space beautiful.

The wind | bâdgir | brick | sun | kite sculpture, because of its visual effect, will be a landmark for the city, as it will be seen at day and night on the skyline, even form far away. The sculpture will serve the city of Masdar as a place where its citizens can go to relax and relate peacefully with the city and the natural surroundings, while also producing clean energy, uniting beauty, tradition and technology.

**Text | 2**

Architecture should create and transform spaces reflecting about past, present and future all together as a time continuum, using it as a way to better think about spaces and the use of both old and new sustainable technologies, that can promote less environmental impact, with carbon-free energy sources and less greenhouse effect.

An outstanding ancient technology like the wind towers should be studied more and adapted to new constructions, that can be used for passive ventilation and cooling systems, decreasing the use of electricity on air cooling systems. As a passive wind system it is a renewable energy that can be employed as a sustainable architectural feature, and can be adapted to different windy areas.

A well thought, planned ahead, easy to assemble constructing system optimizes the site construction, reducing costs, material waste, energy and water, for example, by using interlocked bricks, assembled in a reticular structure the use of cement mixtures will be reduced. Also bricks can be produced locally reducing carbon footprint by using local material sources as well as to generate work to the local community.

Looking at nature to find inspiration to create natural low impact clean energy sources, like the sun, will bring us a better future with less pollution and carbon dioxide emissions. Solar energy is an important source of renewable energy that can change the way electricity is currently produced, as the organic photovoltaics (OPV) are more cost effective; can be applied to glass windows, rooftops or be customized and adapted as an architectural feature; demands less energy to be produced and has a lower carbon footprint. In the future, we hope that this solar technology will be simplified and spread in a way that each house, building or architectural space can self-produce energy to sustain itself.

In this way, studying and (re)designing traditional and new technologies now, we can create a better future with less pollution and less environmental impact.