Masdar City is located close to Abu Dhabi Airport in the United Arab Emirates. It is about a quarter of an hour away, about 40 kilometers away from the center of the capital. The site is located in the southeast of Masdar City and its surrounded by roads from all sides that are not highly trafficked. Regarding the plants there are low desert shrubs cover the site.

Masdar City is the first city that has zero carbon emissions and less air pollution because it relies on clean and 100% renewable energy in the world according to previous studies. It’s a sustainable city that contains residential district with many restaurants and cafes, beside offices zone, shops, and a green public landscape area offering a high life quality with less environmental effects.

In Abu Dhabi the sunrise starts at 6 AM and to 6 PM, that means the sun stays around 12 hours.

There are many challenges in the UAE, on of them is the high temperature and high humidity, in this project we tried to benefit from this issue to generate free electricity in artistic way.

This environment friendly project is a concrete structure designed as a shelter with holes, this concrete shelter has a colored energy transparent panels, this shelter can cool up the external air and provide a clean energy using the sun as a renewable source.

The technology used in this project is the energy glass or the transparent photovoltaic glass, this type of glass collects the energy of the sun and transfer it into electricity, it produces 1 to 2 watts per square feet/ hour. Partially Transparent Solar Panels absorb 60% of the sunlight they receive. The efficiency of these panels is 7.2%.

The difficulty with making transparent solar panels is that the sunlight passes through the transparent material, that means the process that generates the electricity in the solar cell cannot be started because no light is absorbed.

The solution is to create a tinted transparent glass panels to reduce the transmitted sunlight.

This tinted transparent panel fixed in the concrete shelter, each glass panel generate about 456 kWh per year, so with 100 tinted panels this shelter will generate 45600 kWh per year approximately.

 This technique could generate a clean and free electricity and improves the area energy efficiency and filters harmful radiation. Plus, it doesn’t obstruct the view.

This solar panels manufactured by Onyx Solar and used in the Sierra eFacility Building which is the second greenest NC building in the world. Solar glass bends the laws of physics to boost solar power efficiency by **30%** and it approximately convert more than **22%** of the energy in sunlight to electricity.

The second method used is using a concrete structure with small halls which can provide a good thermal mass; when the air pass through a small hall, it moves faster so it entrains more air and there is less warm air there to start with, so most what will reach human is colder air, beside the concrete is a good material to absorb heat beside it’s an eco-friendly material.

The project is an example of combining science with art, this work can generate a free electricity and can become a tourist attraction full of lights, plus it has a balls covered with mesh fabric fixed and suspended from the shelter as a seating area with a touch of fun, this place can be alive day and night with these colorful environment.

Materials:

* Concrete for the structure.
* Colored tinted transparent solar panels.
* Mesh fabric for the suspended seats and lights.
* Microbeads foam covered with stretched fabric.

Dimensions:

* Width: 80 m
* Length: 270 m
* Height: 16 m