**Mangrove plan**

**About the theme**

The main theme of “returning to the source” requires us to think more deeply about the nature of energy. Everything in the world is inseparable from the nourishment of the sun, and plants are the pioneers of energy conversion. Although the conversion efficiency of photovoltaic power generation has caught up to even more than the photosynthesis of plants, from the perspective of economic and ecological benefits, plants still have a lot of places worth learning.

Mangrove forests in Abu Dhabi have used solar energy conversion to improve the surrounding ecological environment before the prosperity of human civilization. How did it do it?

**Mangrove plan**

Abu Dhabi has the largest mangrove forest in the world, the Eastern Mangroves. Because mangroves have the nature of extracting water and nutrients from marsh saline soil, they can grow in shoal shoals on the land-ocean boundary zone. They are a special ecosystem that is over-the-land to the ocean, and it is a multitude of creatures. It provides a fertile natural habitat and a safe home. The roots of mangroves are divided into pillar roots, slab roots and respiratory roots. The developed root system not only has the function of absorbing nutrients, but also forms stable support against wind and waves (like a tripod structure).

**Modular component**

Photovoltaic power generation facilities - groundwater desalination - landscape leisure construction

1. Expand the basic unit of the equilateral triangle with a side length of 3m. (6m side equilateral triangle and 6m side long hexagon)

2. The center of the triangle is used as the fulcrum to connect the center of the other triangle to the cantilever span, forming a support structure with different heights and curvatures.

3. In theory, the photovoltaic construction on each module covers exactly the functional base of another module (desalting and desalinating water storage or landscape rest entertainment).

4, the relationship between modules through the simple logic to form an ecological root system similar to the mangrove, taking into account the beauty and function.

**Nameplate capacity and annual kWh**

In view of the fact that Abu Dhabi's overall climate change is relatively flat and the lighting conditions are good, monocrystalline silicon or polycrystalline silicon photovoltaic modules are more suitable. Considering that single crystal silicon has a high conversion rate, but the cost is high, and the impact on the environment is larger than that of polysilicon, polycrystalline silicon photovoltaic modules are selected in the design.

YINGLI Solar's cost-effective polycrystalline silicon photovoltaic module YGE 60 Cell has a power generation capacity of about 160 W/m2. According to the manufacturer's statistics, the distributed photovoltaic power generation system costs US$1.7/W. The minimum module area is about 15.59m2, and the current total arrangement is about 1000 pieces. The maximum power generation capacity of the power station is 2494.4kw, and the annual sunshine hours are calculated at 2800 hours.

**Total annual solar power :**

**2494.4kw\* 2800h/y\*18% capacity factor=1257177.6kwh.**

Brine desalination unit (net weight: 200kg, length: 800mm, width: 600mm, height: 1700mm), brand: RIGHTLEDER, model: JHH-FSHB10, water yield: 10~11m³ /d, power: 5.5kw. One machine consumes 132 degrees of electricity , and can produce 10 to 11 tons of water per day.

**Total annual desalinated water :**

**1257177.6/132=95240 tons**

**Environmental impact report**

Generators that do not produce emissions (greenhouses or other) do not produce any physical or airborne waste. The structure consists of recycled and renewable materials and uses local materials whenever possible, with low transport impact.

Because the location is the upwind direction of the Abu Dhabi ventilated greenway, the design of the device does not have any toxic gases, and the low compliant wind direction does not affect the ventilation of the area. The design of the facility has little impact on Abu Dhabi's ecosystem, but instead its role is to improve local ecological conditions.