**DESCRIPTION:**

**SOLAR EXPLOITATION**

**#Tree: a small rechargeable battery #**

**When human beings began to survive by means of burning wood, they learnt to use the gift from the sun.**

From the time when humans beings began to survive by means of burning wood, they began to learn how to make use of the gift from the sun. Plants converse the sunlight, a substance that is neither organic nor inorganic, into carbon through photosynthesis. When the wood are burned, the light and heat of the sun are released again in front of those who burn them, like it was shining on the plants in the old time. It can be said that the plant is a small rechargeable battery of solar energy. Along with the life and death of the plants, they continue to convert between solar energy and carbon year after year.

**# Fossil fuel: a 100 million battery #**

Petroleum is derived from the microbial debris accumulating in the water. Coal is produced by the interaction between the plants burying underground and geothermal resources. Plants and animals undergo a carbonization process of millions or even billions of years to form complex materials that store solar energy in fossil fuels in the form of carbon. Billions of years later, when people discovered fossil fuels, solar energy in that ancient time was released. It can be said that fossil fuels are high-capacity batteries that store solar energy, but the long time has become the price of high capacity. The billions-years-long charging cycle makes fossil fuels a non-rechargeable battery.

**¿Solar :“New” resourse?**

**¡Fossil fuel = solar panel!**

**As a new energy source, unlike wind energy, water energy and nuclear energy, solar panels are doing conversion between solar and chemical energy like fossil fuels, but they have shortened the conversion process from billions of years to a few seconds. In terms of conversion methods, solar panels are a new way of energy, but solar energy is not a "new" energy source.**

Rather than saying that the old energy crisis is related to the new energy revolution, humans already have a quickly way to use solar energy.

Form: inverted tree

In this proposal, we put an inverted artificial garden into an ecological forest. The inverted forest divides the space into three parts, and it inserts an elevator straight through to the roof in the middle of the artificial garden. The human's perception of this space will also keep transforming according to the changing of the elevation. At the bottom of the space, there is only an inverted relationship between the two gardens. As the elevator sees the top solar panels, it will be found that "under" the original "root" is the solar panel.

Thus, this upside down space operation makes a montage of the fossil energy in the imaginary bottom of the artificial garden and the solar panels in the real bottom of the artificial garden in the same space, which will create a spatial metaphor.

Although solar panels and fossil energy are different media, they play the same role in energy storage and conversion. The energy crisis is not an energy crisis. The exhaustion of resources does not mean the exhaustion of energy. Although petroleum resources are likely to disappear, humans can keep transforming the sun's energy, which as a gift to the earth, in a more efficient way.

In the urban planning of this new city, we can see the intention of creating an oasis. This image therefore not only responds to the concept of inversion but also provides an intuitive identification between the “artificial” art installation and the “natural” landscape.

Trees in the nature are different under random growth. In the artificial form, the artificial level of randomness is required. Here, the umbrella skeleton is used as a prototype. The form and color are both aspects to be further distinguished between artificial and natural opposition.

**Technologies Used**

1. Solar power technology

The skylight system connecting the roof of the surrounding building forms a whole solar power board over the site, which provides the daily power consumption of the urban residents and also the one required by the device itself. That is the operation of the underground negative pressure ventilation pump.

1. Recycling of freshwater resources

The use of freshwater resources, as one of Abu Dhabi's main energy issues, is also one of the points that we attempt to solve in this proposal. There are two cycles in the specific operation:

The first cycle is to deal with the rainwater. Through the organization of the umbrella-shaped water collecting membrane on the roof, the drain pipes surrounding the device, and the ground pavement, the rainwater enters the underground reservoir, and connects to the municipal water pipe for further clean water treatment for residents.

The second is to make use of the temperature difference between the up and underground to condense the freshwater in the air. In this cycle, the upper hot air is transported to the underground through the interaction of the ventilation pipe and the negative pressure ventilation pump, and then enters the capillary pipes immersing in the low-temperature rainwater reservoir to achieve condensation. Finally, the condensate water on the inner wall of pipes flows into the condensate reservoir and then connects to the municipal drain pipe for further clean water treatment for residents.

Therefore, in this project, we not only collect rainwater, but also use the collected rainwater to create condensed water. Both water forms the freshwater resource. We not only carry nature, but also create nature, using any fresh water that could be wasted or ignored.

1. Unplugged air condition

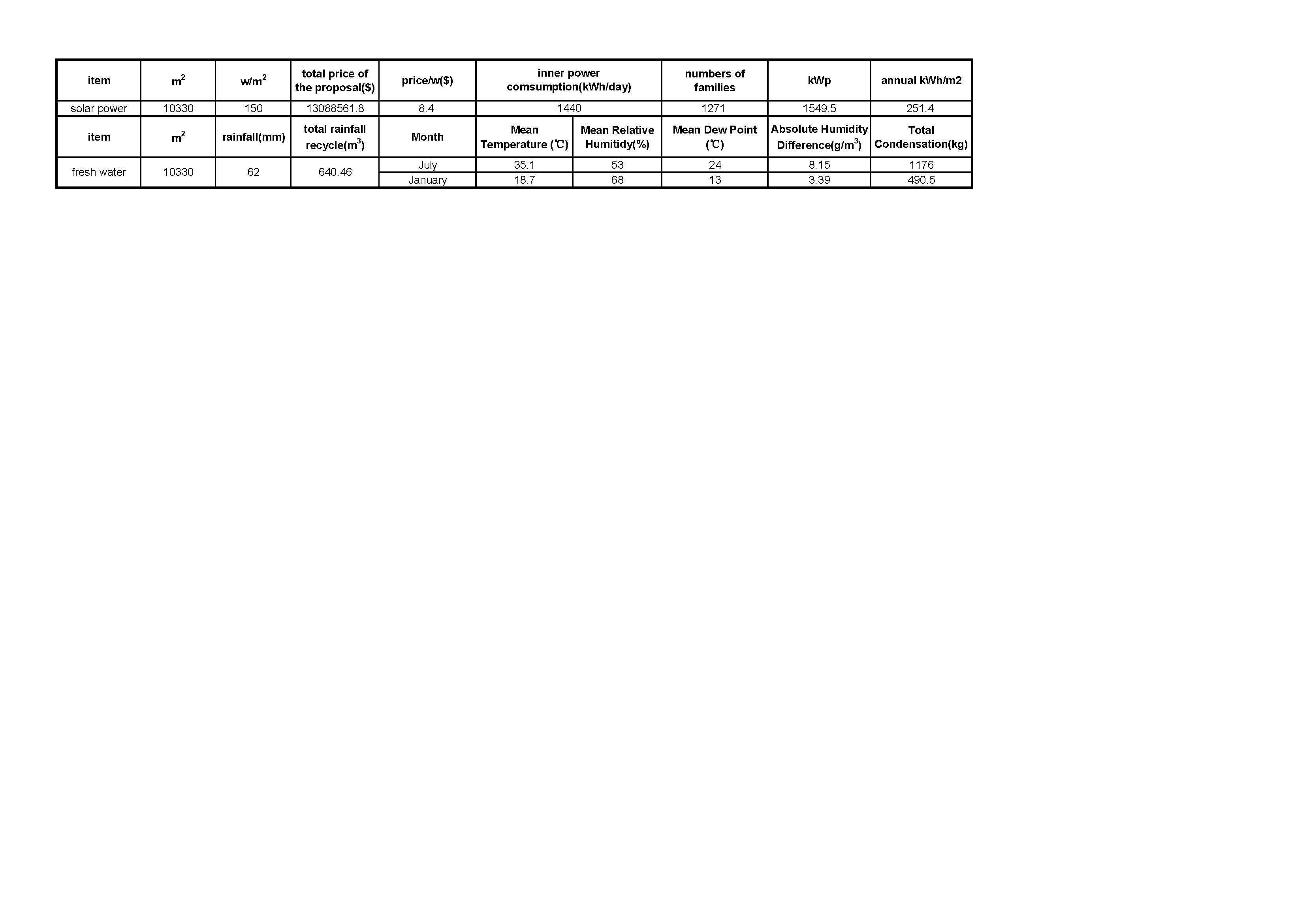
After the hot wind introduced into the underground reservoir, the heat exchange between the hot wind and the cold water happens. Meanwhile the condensate water generates, the hot wind has been cold down. When it is released out of the facility, the cool wind reduces the temperature outside, which forms a more pleasant micro-environment.

1. Luminous painting

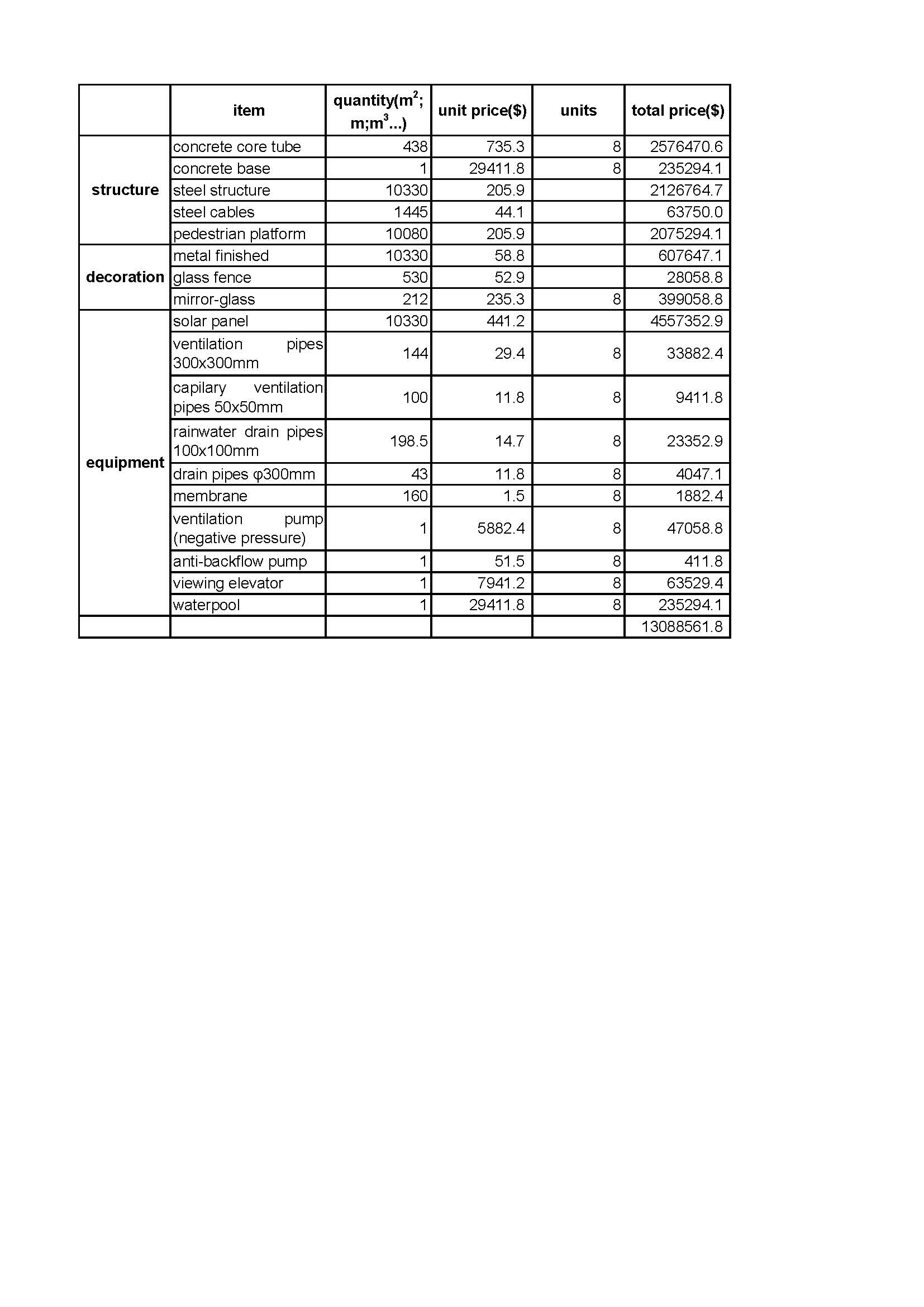
The painting is used on the steel cables on both sides of the pedestrian platform. The sunlight absorbing during the day becomes a self-illuminating source at night, bringing subtle and unique landscape effects to the night view of the new city, as if the light entering the dense forest through the gap.

**Environmental Impact Summary**

It can be seen from the above technology that the energy brought to urban residents in this proposal is solar power and fresh water. We visually see the energy values of both through two sets of calculations:



**List of Materials & Conceptual Cost Estimate**

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