Masdar City Land Art Project

TITLE:

**The SOLAR FOREST WIND PARK**

CONCEPT:

Imagine a park of the future. Visitors stroll and relax in the cool shade of tall trees. The branches and leaves protect from the hot sun above and create a crosshatch of interesting shadow patterns below.

A fine mist drifts from the lower branches cooling the air. The mist turns into a light drizzle. Then the crackle of thunder off in the distance warns visitors that it will start raining soon. When the showers come, everything receives water in just the right amount at just the right time. Some visitors, especially children, like to walk or run around in the rain and enjoy its refreshing powers.

The botanical garden-like setting invites exploration. Plants from all over the world reflect the biodiversity of our planet as the park transitions from dessert to tropical zones. Visitors can enjoy it aesthetically, spiritually and intellectually.

It is a place to restore your senses. It is a place to go with family and friends. It is gathering place. Most interestingly, it is a place, which generates clean, renewable, and sustainable power.

The SOLAR FOREST WIND PARK is a melding of high-tech engineering, materials, and design. All three disciplines combine to create an aesthetically pleasing and functional land art project for the city of Masdar.

DETAILED DESCRIPTION:

Board 1:

As people walk the SOLAR FOREST WIND PARK, evening descends. They start enjoying the cooler air and look up to take in a spectacular light show.

Tree structures as tall as 50 meters tower above them with eaves glow from below. They bath the entire space in multicolored ever-changing hues. The transitions are slow, subtle, and subliminally relaxing.

The branches gently move with the wind adding a kinetic essence to the overall experience. The trees and park feels alive and full of energy. As well as it should be. The park produced solar and wind power all day long.

As night descends, visitors continue to enjoy the benefits from the energy generated at the park. The SOLAR FOREST WIND PARK not only produced enough clean energy for its own uses it was able to put energy into the city electrical grid. It is the ultimate multi-purpose space.

BOARD 2:

Starting at the top of the page, the rendering shows how the SOLAR FOREST TREES would fit within the allotted Land Art project site. Since the trees are individual assemblages, they would fill the volume in a friendly manner without overwhelming the surrounding buildings.

In much the same way architects use natural trees to landscape their projects, the SOLAR FOREST TREES would complement nearby structures without competing architecturally.

Since the trees are individual assemblages that stand apart from each other they could be spaced, sized, and configured in multiple ways and even changed over time by adding, subtracting, or making them shorter or taller.

For purposes of scale, the tallest tree would not exceed fifty (50) meters or roughly the same height as the tallest palm trees in the world. The trees would vary in height based on how many ‘base segments’ are stacked. Each section would be five (5) meters in height. Therefore, a tree of twenty (20) meters would be composed of four (4) segments.

As shown middle of the poster, a simple grid pattern organizes the space. There is an UPPER PARK portion and a LOWER PARK portion connected by meandering paths and pedestrian bridges. People can freely walk between the two zones. At both ends of the park, there are raised concrete stepped areas, which double as public gathering spots, and wind breaks at ground level

FUNCTIONALITY:

Referencing the lower diagrams, the first drawing shows an illustration of a basic modular TREE SEGMENT made of an aluminum alloy. Each TREE SEGMENT is compatible with every other unit and consists of a central support column, six (6) leaf-like PODS supported by BRANCHES fanning out in a symmetrical pattern.

The leaf-like PODS are multifunctional. The upper surfaces hold an array of solar panels. The lower surfaces feature lights and a water management system designed to deliver flows ranging from a fine mist to a light rain. The water feature cools the air for day visitors, waters the plants below, and cleans the solar panels from dust in order to maximize power output.

Each POD is capable of changing its angle of orientation toward the sun in order to maximize power absorption. The adjustments are computer controlled and barely perceptible. By midday, the PODS fully extend to capture the sun’s rays overhead. Visitors by then will have perceived the change and will notice the added shade. By night, the PODS retract showing more sky and views of the moon or stars.

POWER POTENTIAL

As envisioned in this embodiment, the SOLAR FOREST WIND PARK contains twenty (20) trees. Each tree consists of up to six (6) SEGMENTS totaling 240. Each SEGMENT features six (6) PODS totaling 1,440. Each POD holds four (4) conventional solar panels totaling 5,760.

Assuming five (5) hours of direct sunlight per day, and the efficiency of the solar panels to be around **500-550 kWh of energy per year, the system is expected to produce 3.168 Gigawatts.**

**It is roughly three times the energy density that would be expected from a** large fixed-tilt photovoltaic solar power plant spread over 2.8 acres producing 1,000 megawatt-hours per year.

There is a clear advantage to going vertical

Although the primary power generation is solar collection, the TREE SEGMENTS can rotate with the wind to supplement the energy production. Unlike traditional windmills, the direct drive generator is located at the base at ground level for ease of maintenance. Each POD assembly counter-rotates for stability reasons and to eliminate the dizzying visual effect traditional windmills can induce. Additionally, torque controls limit the speed of the rotation to create as near a natural affect as one would experience seeing a flock of birds flying.

BOARD 3:

The visual spectacle of seeing a forest of mechanical trees generating clean, renewable, and sustainable electricity will bring visitors from near and far. It will be a learning and aesthetic experience. It will be something to talk about and emulate since the idea is scalable and urban friendly.

Traditional solar farms are mostly remote and vast because they require a lot of ground area. As a rule, they are industrial, uninviting, and single purpose.

The SOLAR FOREST WIND PARK offers a different solution. Instead of an industrial zone, the solar panels sit high off the ground in a tree-like array giving way to a park-like setting below. Nature and technology come together to make a creative multi-purpose space.

As the illustration shows, the SOLAR FOREST WIND PARK will be an uplifting sight both different and majestic; both functional and aesthetic; awe inspiring yet complimentary to its surroundings.

It will leave everyone with positive impressions and pleasant memories as an enjoyable place to visit many times. Most of all it will create a new appreciation of what renewable, clean, and sustainable energy can represent.

Thank you for your consideration.

**ENVIRONMENTAL IMPACT STATEMENT**

As envisioned, the SOLAR FOREST WIND PARK will be an environmentally friendly project.

In principle, the additions to the existing site will not alter any terrain or require the removal of native animal or plant species. There are also no reasons to access, change, or destroy any water resources. The proposed improvements and additions will not create any runoff or chemical discharge. All infrastructures will be undergrounded.

As a park, the usage will be low density. Only minimal services such as drinking fountains and restrooms require building. Such facilities would tie into the existing Masdar city infrastructure.

Since the proposed structures will be manufactured offsite, the only onsite activity will consist of assembly and simple landscape and hardscape work. The addition of vegetation will support local bird and insect life.

Light and reflective materials will minimize atmospheric heat gain. Substantial planting of native and other species of plants will further improve the heat signature. The project will not generate an additional urban hot spot.

The site will be used for passive activities only. As a park, the amount of garbage will be limited to what people bring with them during visits. Minimal city services will be all that is required to keep the location clean.

Simple maintenance procedures will be required to keep the space respectable; this will include landscaping, gardening, and simple upkeep. A small crew of dedicated workers will be able to handle the tasks easily. Staff will perform other work off-site including management, power generation monitoring, and associated tasks.

In total, the SOLAR FOREST WIND PARK concept will have a minimal environmental impact.

Respectfully submitted,