**SOLAR WAVES**

*Waves stirred by the wind that also sweeps the land: in a burst of energy that SOLAR WAVES transform into waves of solar energy, while rainwater becomes a new reserve for the earth and for mankind – ideal nodes and tides of active forces that become part of the life cycle that transforms and renews everything.*

'SOLAR WAVES' are photovoltaic sculptures representing ocean waves, one of nature's most fascinating and majestic phenomena.

Inspired by the waters surrounding the island of Naviti, SOLAR WAVES unfold a surface that performs a dual function: converting solar radiation into energy, thanks to the photovoltaic panels that cover them; collecting rainwater in a tank located inside them, sliding on the inclined surfaces.

A source of emotion and a hypnotic expression of movement and beauty, ocean waves are also a manifestation of the force of nature that greatly influences the lives of people living on the Pacific islands.

The installation aims to draw attention to the consequences of climate change on the coasts of Fiji, where global warming is causing sea levels to rise and waves to become stronger, resulting in coastal erosion and flooding.

**SEA WHAT HAPPENS**

*‘The Man and the Old Sea’. A work of changing volumes and transparencies, for a heartfelt appeal: because saving the life of the ocean means saving the life of man on earth.*

A healthy ocean is vital for the entire global ecosystem; for the inhabitants of the Fiji Islands, it takes on an additional dimension of daily urgency, representing a fundamental presence not only for health, but also as a symbol of history and culture.

'SOLAR WAVES' thus becomes an ideal symbol of the cultural identity of the village of Marou, representing both its vital dependence on the ocean and its vulnerability to its powerful forces.

**SEA ON LAND**

*A vision of a too near future scenario. A visual call to turn a threat into responsible, urgent, cooperation.*

*Aware of the need to respect ethical and environmental diversity for our common good - the world we live in.*

*The white foam of the sea, the powerful light of the sky.*

*A striking play of light and shadow created by the movement of straight and curved lines reflects the natural light in the day and whitens the night, aping the changing reflection of the sky in the movement of the ocean waves.*

The sculptures of 'SOLAR WAVES' blend into the landscape in an ideal movement of harmony and continuity: their sloping surface follows the contours of the terrain, rising gradually to connect with the natural environment with a concave surface of varying width and depth, creating a possible meeting and resting place for visitors to the area.

The installation defines a free area open to various uses, such as public events or artistic performances. The concave shapes of the sculptures are protected outdoor spaces that offer shelter from the sun during the day and illuminate the area in an evocative way at night.

The interior of the individual sculptures can house a cistern to collect rainwater or can be used for various collective activities or to serve the area.

The art complex features an open and flexible compositional system consisting of a set of sculptures that can vary according to the needs of the program; the installation allows for construction to be carried out in phases with a system of subsequent growth based on economic availability and energy needs. The artworks are modular and can be combined in different ways, adapting to different situations.

'SOLAR WAVES’ have a white metal structure composed of two side walls that support a rectangular photovoltaic plane and a concave surface that connects the crest of the sculpture to the ground.

The structure and the PV panels are white as they represent ocean waves breaking on the coast; the flat surface incorporates monocrystalline silicon photovoltaic cells with a custom lamination of high-transmittance white nano-film that is applied over the module during assembly, concealing any hint of the solar technology behind.

Each ‘WAVE’ can have a different orientation depending on the energy needs at different hours of the day and consequently its PV surface can have a different inclination to intercept the solar rays.

The artworks can have three different inclinations on the horizontal plane: 19° for the PV array facing north and 30° and 40° for the modules facing east and west, depending on the energy requirements; these inclinations result in different crest heights and curvatures.

Three types of ‘WAVES’ with a similar shape but different proportions form a family of equal but simultaneously different objects with a common set of laws of behavior.

The programmatic flexibility also allows for the artworks to be made at different scales and therefore for the PV systems to have different surface areas:

- The ‘large’ scale sculpture features 19°, 30° and 40° inclinations with respect to the horizontal surface for north, east and west orientations, with wave crest heights of 4.2, 6.5 and 8.3 m; in the project each PV system has a surface area of ​​130 m2. The sculpture facing north, obtaining the maximum efficiency of the panels, has a photovoltaic surface inclination of 19° and can produce 25 kW.

- The ‘medium’ scale artwork features the same inclinations for the different orientations, with wave crest heights of 2.7, 4.2 and 5.4 m. Each proposed PV system has a surface area of ​​50 m2, capable of producing 9.5 kW.

- The ‘small’ scale object is an outdoor lamp used for public and private lighting.

The electricity production capacity of the entire complex depends on the number of sculptures, their size, inclination and orientation; three ‘large’ scale or eight ‘medium’ scale artworks oriented towards north produce 75 kW.

The prototype could be on a smaller scale than the ‘medium’ sculpture.

The local community can intervene on decisions regarding the number of the sculptures, their positions, dimensions, inclinations and orientations based on their energy needs.

After the initial construction, other modules can be added to increase the energy production.

The construction simplicity and the use of tested and commonly used materials guarantee excellent durability of the sculptures and their easy maintenance, allowing the local population to intervene during the construction works and take care of the complex afterwards.

The rainwater slides on the inclined upper surfaces, penetrating through some cracks between the PV panels and being conveyed into the water collection tank located inside the artworks.

The complex's overall water containment capacity depends again on the number of sculptures, on their inclination and size.

The ‘large’ scale module with a 19° inclination on the horizontal plane can contain 100.000 liters of water, while the ‘medium’ scale one has a capacity of 40.000 liters; each tank can contain up to 140.000 liters, as in the case of the ‘large’ artwork with a 40° inclination.

Therefore, three ‘large’ scale or eight ‘medium’ scale sculptures with a 19° inclination can contain 300.000 liters of water; with greater inclinations and a higher number of modules the overall capacity increases.

The artworks have a reasonable cost of production and maintenance, considering their formal and constructive simplicity, the use of rectangular photovoltaic panels and the ease of reaching the inclined surface.

The installation cost of the PV surfaces is expected to be slightly higher than a purely utilitarian installation in Marou, due to the peculiarity of the custom lamination of the panels, so the cost could be around 900.000 USD.

‘SOLAR WAVES’ integrate into the landscape and do not interfere with natural ecosystems, supporting the function of the landscape as a public amenity.

The compactness and simplicity of the sculptures' shape allow the local natural system to coexist and interact with the social everyday life, as well as with the cultural activities that can be organized between and inside them.

The intervention is safe for people; it does not generate greenhouse gas emissions nor other form of environmental pollution.

If necessary, systems can be provided to prevent the accessibility to the inclined surfaces.

The sculptures have an aerodynamic shape, in this way they do not interfere with strong winds and cyclones.

The artworks can be disassembled and assembled - and are pragmatic and constructible, employing tested scalable technology.

***SYNOPSIS***

*- The artwork is a symbol of the ocean;*

*- The installation aims to draw attention to the consequences of climate change;*

*- The waves are three-dimensional volumes blending into the landscape;*

*- The artworks integrate the energy production and the water harvesting;*

*- The installation is composed of single sculptures for programmatic flexibility and ease of prototyping;*

*- The possible different orientations of the waves can satisfy different energy requirements;*

*- The internal spaces of the waves can have different uses.*

*- The structures are aerodynamic to avoid the impact of strong winds;*

*- The use of minimal sculptures facilitates their construction and maintenance;*

*- The sculptures are scalable;*

*- The use of standard panels reduces the installation cost;*

***Waves - source of light and water***

***Waves - source of art and beauty***

***Waves - source of shade and shelter***