**Introducing ECOTONE**

*Ecotone* heralds the future of public art in which the new mega art trend meets activation and animation to create a place that is at once art, landscape, museum and park. *Ecotone* offers a wealth of experiences and will be a new heart for Masdar.

The undulating surface, evoking waves and dunes, invites families and friends to stroll and explore; to settle for an evening picnic and marvel at the solar concentrator dishes tipping towards the heavens or to enjoy the timeless rotation of the stars. An exhilarating rush through the Fossil Tunnel on the GRT delivers commuters art on the move, with a glimpse of the prehistoric animals that once roamed the land. The landscape peels up revealing a shady hidden grove of high-tech mangroves that desalinate water for on-site use, while an observation window allows people to see how the solar Stirling engines generate electricity.

Drawing its name from transitional landscapes, *Ecotone’s* underlying theme is the transition from old to new, from nature to technology, and from the past into the future. Concave solar collectors that convert heat into mechanical energy harken back to simpler times, while convex photovoltaic domes emerge from the landscape proudly displaying modern solar technology.

*Ecotone* explores the tension between slow and fast, between analogue and digital. It pays homage to heritage revealing the archaeological wealth buried beneath the desert sands, it elevates the spirit with aesthetics, it encourages wellbeing with a landscape inviting physical exploration, it engages the mind with information and it encourages community interaction and connection for all ages. Iconicity in public art derives from people’s experiences and *Ecotone* is memory-making art.

**Technology**

*Ecotone’s* primary power generation is achieved by four giant sun-tracking **solar concentrator dishes**, which are 15 metres in diameter, and that are linked to subterranean **Stirling engines**. Sunlight is collected and focused into the centre receptor, and energy is then generated by cyclic compression caused by the expansion of gas at different temperatures, resulting in piston movement inside a cylinder. This process generates electrical energy in simpler, more ‘analogue’ way compared to traditional photovoltaic systems. Photovoltaic dome shelters provide supplemental power and shelter from the sun, however the solar concentrator/Stirling engines produce power at a cheaper rate with higher efficiency than typical solar systems. These two systems combined produce approximately **1500 kW/h** of energy per day during peak months, equaling an approximated **250,000 kw/h** a year.

In addition to energy generation, *Ecotone’s* Techno-Mangroves perform electrodialysis reversal desalinisation of groundwater. Though small in volume, this is enough to supply the site with filtered drinking water.

**Cost Estimate**

Based on a hypothetical budget, the total cost is thought to be approximately **$15 p/kWH.**

**Dimensions**

The site is made up of distributed design elements. The 4 solar concentrators measure 15 metres in diameter. The approximate size of the active site is 80 metres in width, 170 meters in length, and at its highest point (to the top of the largest solar dome) is 11 metres high.

**Materials**

* Recycled steel
* Stainless steel
* Lithium-Ion batteries

- EFC concrete (which uses geopolymers made from industrial waste by products and reduces carbon emissions by 80%-90% compared to traditional cement)

- BComp natural fibre composite reinforcement material

- NuPlay ground cover made from recycled rubber - with drainage features and dust minimisation

* OEL (organic electro-luminescence) light panels

**Environmental Impact Statement**

As the current LAGI Masdar site is devoid of flora and fauna, there is no clearing, disruption to an existing eco system, or any environmental displacement necessary. The site is already cleared and demarcated for the purpose of a public art installation. Due to the permeability of the ground cover, Ecotone is designed to absorb and collect excess moisture and water, as well as the ability to draw up and desalinate ground water for on-site use such as filtered drinking water. Lighting is either ambient or downward facing, in order to not disrupt residents and those occupying the forthcoming residential and R&D facilities adjacent to the site. Noise pollution is negligible with the only possible impact being that of crowds during peak interaction/use times. To reduce the environmental impact, an effort has been made to reduce the amount of traditional building materials in favour of more lightweight, strong, and renewable building technologies. Firstly, avoiding traditional cement and opting for one with lower embodied energy and carbon-capture technology is a critical step. Recycled steel will be utilised for the framework and skeletal lattice of the landscape, while a combination of EFC concrete, BComp natural fibre composite and NuPlay recycled rubber ground cover will form the top surface. This provides the benefit of strength, pliability, impact resistance, lightness, and serviceability and repair/modification in the future. The subterranean portion of the site houses Stirling engine power generators and lithium-ion battery banks, safely away from the public but also accessible for servicing and maintenance. Ecotone seeks to be in harmony with nature and Masdar’s surrounding infrastructure.