*Dunescape*

The project seeks to create an art installation that engages with the use of renewable energy, with a focus on wind power to create both energy and sculptural form.

The basis of this concept stems from Abu Dhabi’s notorious “Shamal”, the strong north westerly wind that passes through Masdar City, bringing with it harsh sand storms. The LAGI 2019 site is oriented in a north westerly direction, meaning wind could be captured at its strongest point on this site. This also created an opportunity for the wind to be more than just an energy generator, it could also shape the installation itself.

The winds are the driver of form, creating monumental sculptures that simultaneously could gather electrical energy with winds travelling up to traveling up to 178 km/h.

Giant mesh structures form the skeleton of the installation, suspended off a steel I-beam frame, dwarf the surrounding buildings of Masdar City. Through the offsetting of a series of layers of fine mesh and fabric, the alien forms begin to gather sand and gradually blend into the surrounding context of Masdar City and greater Abu Dhabi. The support of the mesh and frame allows the sand to be gathered into a dune far surpassing the heights of anything that would form naturally. The five dunes are offset from one another in both positioning across the width of the site, and in height, tapering up towards the rear. This helps to maximise the collection of sand and wind energy. The wind energy is captured by a slot in the dune structure that houses a strip of Savonius Wind Turbines. This component of the structure is connected to a generator that sits suspended amongst the junctions of horizontal and vertical I beams.

As the dunes eventually reach a point where they are covered by sand, the interior of the dune becomes the only place on the site shielded by the Shamal winds. The tent like form of the mesh is stretched out and pinned into place by giant steel pegs. It is in between these securing pegs that the dune structure is accessible, where the mesh begins to lift up off the ground. A cavernous interior sits under the multiple skins of structure above.

The dune belt, facilitated by our mesh forms, creates an ephemeral space that is ever changing. By taking a common land form in this area of the world; the sand dune, and extremetising it in a city context, the dune becomes alien. In the attempt to replicate an organic land formation with man made materials, the dunes will be seemingly familiar from afar, but up close the perfect edges, perforations and suspended entry ways will create a jarring juxtaposition. At the intersection of materiality, scale and context we have curated a dune field formed and powered by the Shamal wind.

Environmental Impact Statement:

Throughout the design process we have been sensitive to the Abu Dhabi context, by dedicating a majority of our project research to forming a true understanding of the culture, environment and future vision of Masdar City. Our installation is sensitive to, and designed in line with the existing environmental factors, in particular the “Shamal” north westerly wind. The structure itself is minimal in its construction requirements, with the only excavations of the site being for the footings of the I-beams. All other structural components sit above ground; the mesh form and the securing steel pegs. It was imperative to our project that the structure was kept light and unobtrusive so as to achieve the organic sand dune form that could easily blend into the surrounding landscape. Once built, the dune field will also help to mitigate the harsh north westerly winds by capturing the sand storm in its multiple skins. The offsets of the dunes means that if the wind energy and sand is not captured by one dune, it will be captured by another as it travels down the narrow corridor of the site. In our research into the construction of Masdar City, we found that these storms can be so strong that work must stop until they pass. Our design will help to offset the winds cutting through the path of the site, whilst also harnessing the energy that it brings with it.

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| **Materials** | **Estimated Amount** | **Conceptual Cost Estimated** |
| Primary Weave Mesh Layer | 35400 m2 | $1,800,000 |
| Secondary Weave Mesh Layer | 35400 m2 | $1,800,000 |
| Porous Fabric Cloth | 35400 m2 | $600 |
| Steel I-Beams | (150x150x6cm) 180 | $108,000 |
| Concrete Footings | 5000 sqm | $1,700,000 |
| Steel Peg Anchors | 30 units | $800,000 |
| Solazone Vertical Axis Wind Turbine RS-400 | 300 units | $467,000 |

**Kilowatt Hours:
1,051,200 kWh per year**

**2,880 kWh per day**