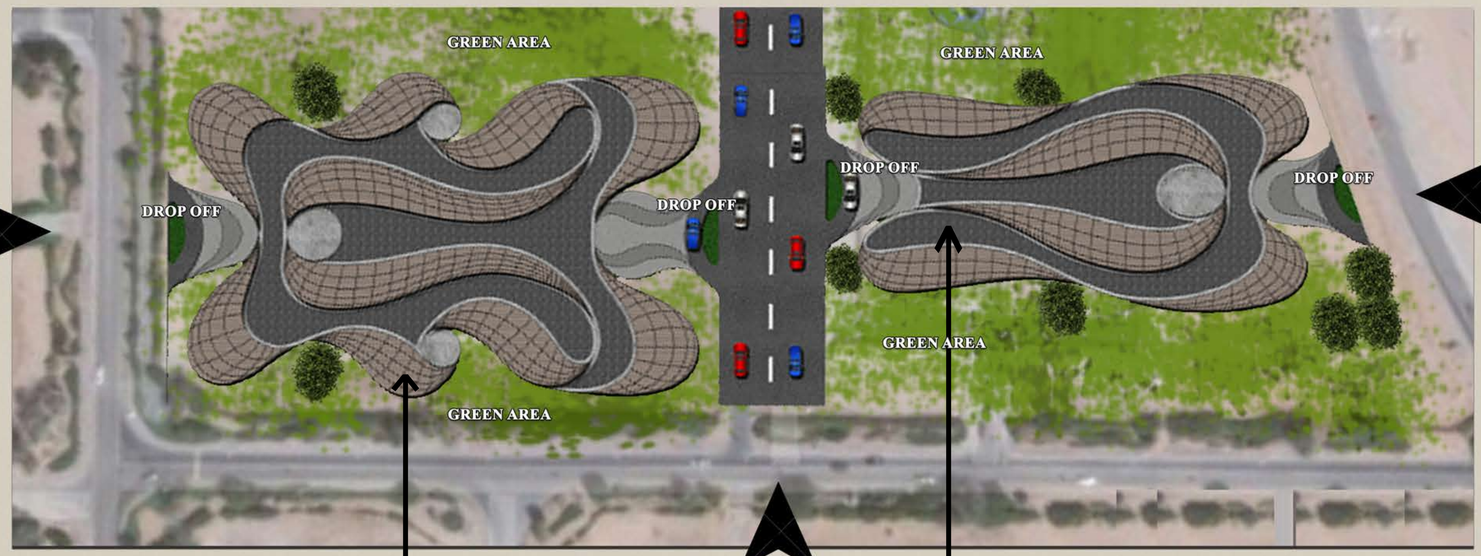


Wavecity generates electricity by harnessing solar power and incorporating kinetic pavement in the design. Masdar City has good exposure to sunlight throughout the year therefore using solar power to generate electricity is more beneficial than using other types of renewable technology.

The solar panels are Sphelar® BIPV (Building Integrated PhotoVoltaics). This type of solar cells consists of arrays of 1-2mm dia micro spherical solar cell on a transparent flexible membrane. Having a capacity to capture rays from all direction, Sphelar Cell is less dependent on the angle of incoming light thus giving a higher efficiency as compared to other conventional solar panels. The transparent membrane also helps to illuminate the insides of the structure to a certain extent.

Kinetic Pavement is provided by Pavegen. It is a triangular composite tile with electro-magnetic generators incorporated below it. As pedestrian walk across the Pavegen flooring system, the weight from their footsteps compresses electromagnetic generators below, producing 8 watts of off-grid electrical energy per step. Pavegen system also continuously monitors footfall, providing the ability to predict peak timings and prime locations.

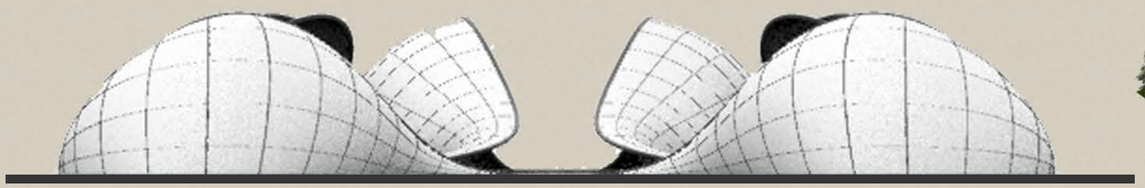
Energy from each panel and floor tile is channelled through an underground grid line to an onsite substation (15m x 15m x 7.5m). The substation includes a battery to store the power generated, an invertor to convert DC current into AC current and a step up transformer to increase the voltage and reduce the current in the distribution feeder so that the heat losses and cost of feeder are minimised. The energy can further be distributed in the city via distribution feeder (grid lines).

SPHELAR SOLAR PANELS

Efficiency (E) = 20%
Average Solar Radiation (R) =264 w/m2
Average Exposure in one day (D) = 6 hrs
Total Area of Solar Panels (A1) = 12,320 m2
Energy Output of 1 solar panel/day (E1) = R x D X E
= 264 x 6 x 0.2
= 316.8 w hr/m2
= 0.317 kw hr/m2
Peak Capacity of the installation (P1) = R x E x A1
= 264 x 0.2 X 12320
= 650 kw
Power generated annually (T1) = P1 X 365
= 3905 X 365
= 1,425,325 kw hr
= 1,425 Mw hr

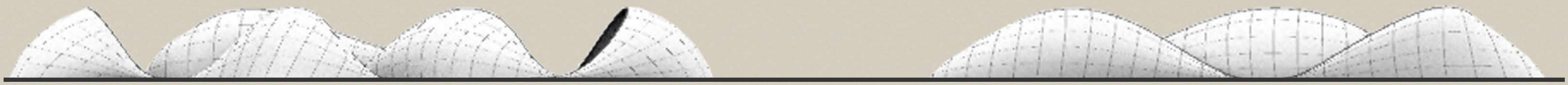
PAVEGEN V3 KINETIC PAVEMENT

Energy generated (EF) = 8 watt/ footfall
Average footfall (Fa) = 5000
Average Exposure per day (D) = 6 hrs
Peak Footfall (Fp) = 20,000
Total Area of installation (A2) = 5000 m2
Peak Capacity of the installation (P2) = Fp x Ef
= 20000 x 8
= 160,000
= 160 kw
Power generated annually (T2) = Fa x Ef x D X 365
= 5000 x 8 x 6 X 365
= 87,600 Kw hr
= 87.6 Mw hr



ELEVATION C

ELEVATION B



ELEVATION A