**Design Concept**

‘Solar Could’ is conceived as a land art energy generator born from complex urban context and new climate challenge. Fluid dynamics was taken as the conceptual and technical basis prototyping a new type of urban space, which is not only open to the public, but also functioned as members of the energy infrastructure in the city. The exploration of fluid dynamics as a digital tool forming this particular land art connects the re-generation of natural energy flow together with human interaction, which system is not isolated but related to human behaviors on the site.

Developing a multi-layered energy infrastructure system using natural light collector, movable batteries, passive cooling, landscape integrated pavement lighting, and light weight urban furniture is a process re-phrasing individual presences with one another for an integrated differentiated outdoor land scape/art.

Our proposal of ‘Solar Cloud’ also investigates the role of collective solar panels as a subsidiary self-shading system, acting as a catalyst of active public space. By working with crowd flows and urban space connectivity, ‘Solar Cloud’ is creating multiple stages for public activities on the site, where ‘Solar Cloud’ moves from the Esplanade to the St Kilda Triangle, then extends across Jacka Boulevard to the shore, creating three major fields from rigid to more dynamic urban fabric integrating with the existing one.

Further exploration of the strategic setting energy infrastructure systems gave us a repertoire of rhythms that allowed us to adjust the configurations of each field space. Development of the parametric system helped us to be more predictive in the process of transforming the aggregated energy collectors (Cloud) into realistic outdoor space. The physical construction that operated in all the levels of the fields, starts from a local condition to a global rhythm, reacting to variable design inputs on site.

**Sustainable Strategy**

The site sits in the middle of famous St Kilda beach in Melbourne, a coastal city with a temperate [oceanic climate](https://en.wikipedia.org/wiki/Oceanic_climate) and is well known for its changeable weather conditions. While in recent years, extreme weather conditions of high temperature in the summer days increases in both its frequency and duration, which gives huge pressure to the local new sustainable powering system converted from non-renewable energy resource (such as coal). The position and design principle of the sustainable strategies to this specific land art will adapt to this new challenge, to minimize the energy consumption through passive cooling system while to maximum the energy generation through intelligent solar clouds.

Lifted landscape enables multi-directional view corridors, transforming St Kilda square into a new scenic destination with abundant parking space for both private and public transportations

Considering the potential of having large outdoor events and leisure activities on site in the future, the key of maintaining this place as an all year around popular one is to prevent over-heated land surface, more directly over-heated air during summer peak days. The scope of the design extends to the bay area, absorbing the water from the sea as a neutral and free media to exchange the heat

The process of the heat/energy exchange through capillary flows on site will be conducted through collective intelligent emerged from the individual performance of the solar receiver embedded at the ‘Solar Cloud’’s family members. The rest of the energy will be transformed and stored in plants (battery) underneath the lifted landscape, which will support the neighborhood as extra electricity plan.

The annual kwh generated on site is estimated as: 3145716 kwh/y = 5130 m2 x 4.2 kwh/m2d x 365dx 40%.

Note:

Data of monthly mean daily global solar exposure at St Kilda Harbour is referenced from Australian Government Bureau of meteorology at

<http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=203&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=086220>

The estimated electrical efficiency of intelligent PV cell is about 40%.