CDEFG-Park

CarbonDioxide-Eliminating Floating Green Park

DESIGN PHILOSOPHY

The Rule of Nature: **WASTE IS FOOD**. Simple but conscious designs to create not just an urban green extension, but a sustainable system utilizing algae to turn car exhaust (CO2) into power for the city, with fresh water as a by-product to support park's vegetations. The three functional modules: Algae Cell to turn CO2 to H2+O2, the Fuel Cell then convert them to electricity, stored in the Storage Cell for city's use, redefining unpleasant space below express way to a floating dual function green interface.

This project "CDEFG-Park" is an exploration to give a new definition and understanding to the energy producing infrastructure. The "functional structure" is a now turned into a manifesto of the urbanlandscape, conveying fresh and healthy city image and unfolding the sustainable green dimension of the local fabric. Searching for the new intriguing dimension as part of public-enjoyable space of the region, the algae-power-production park design successfully achieved as a repricatable prototype for future urban green energy sources.

CARBON DIOXIDE ELIMINATING ECO-DESIGN

Understanding the site, a shore front express way next to the dense urban residential developments in Hong Kong, a CO2 collector louver system integrated with noise barrier to screen off these two elements on the express way. Car exhaust CO2 is now being bumped to the Algae Cell module for the Hydrogen-producing marine algae (Chlamydomonas reinhardtii) as food to produce Hydrogen (H2) and Oxygen (O2) gases via photo-chemical process, the gases is separated by the selective permeable membrane (similar to the GOTEX technology) within the unit, which is then feed into another floating park module: the Fuel Cell Unit to convert H2 and O2 into electricity, with water as by-product to irrigate the vegetations on the modules' decks. Energy is temporary store in the Storage Unit, which also serves as a multi-purpose floating platform for various activities and exchange for the neighborhood, and then fed to the city grid to power up the city.

$$CO_2 + \text{Sunlight} \rightarrow H_2 + O_2 \rightarrow H_2O + \text{Electricity}$$

WASTE TO FOOD, BAD TO GOOD

Not just using Automobile exhaust as power generating input to produce useful power, the modular floating park design also redefined the unpleasant left-over urban space to a green and accessible park the for neighborhood and locals' to enjoy the shore front, which used the be cut off from the city fabric by the expressway infrastructure. Now the express way served as a cover and supplier for the park as well as a growing media for climbing plants on the supports. The standardized modules can be produced with relatively low cost; the three modules can be resembled in different ratio according different scenario and geographical configurations for different modes of operation. This is just the start, but will be way forward.

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