

OFFLINE PARK + SOLAR FOREST + LIVING STRUCTURE

OFFLINE PARK

Sustainable development should be two pronged— generative and reductive. A public park is a public good. The schrebergärten was the late nineteenth century garden-as-antidote prescription to the rapid growth of the industrial city, a green-escape for mental wellbeing among the suffocation of the metropolis. Today our mental-health problem is not the industrial city, but the new culture of data and our inability to switch-off. The park of the 21st century will be an OFFLINE PARK; an urban space shielding electromagnetic radiation (blocking phone signal). This new type of public (and private off-grid) park-as-antidote is too a prescription for mental wellbeing and a green-escape, this time from the suffocation of an always-alert life. Our project is fundamentally the reinvention of the park (in the spirit of Dr Schrebergärten) as an entirely new type of energy-landscape-infrastructure. Our project generates solar-energy (a solar canopy) at the same time as reducing energy-in-use (placing smartphones and data consumption on pause). Our solar canopy (a woven 96% open mesh incorporating a multitude of micro spherical solar cells) forms a healthy shield against electromagnetic

- 01. Art nouveaux lamp post, Wasserturm Water Tower, Friedrichsplatz square, Mannheim
- 02. Living-sculpture willow tree, Luisenpark, Mannheim
- 03. Mannheim Multihalle, long-span gridshell, Frei Otto, 1975, "The Wonder of Mannheim"



radiation, so as both to block phone signal (a faraday cage, in combination with mesh screen walls), as well as to protect butterflies (and other insects) that are suffering species decline in Germany due partly to the harm of electromagnetic radiation, and which are so essential to biodiversity as pollinators. A micro spherical solar mesh is able to receive the suns beam from varying directions, and so can be incorporated into an undulating surface such as that formed by a mesh or textile. The act of reforestation contributes carbon sequestration, flora and fauna habitat, and in the situation of the former Spinelli barracks, contributes even further to the mitigation of the heat island effect (the sites development goal). Our solar canopy is supported by a living-willow-structure (instead of an energy-intensive concrete and steel foundation and sub-structure for example), and is inspired formally by the art nouveau light stands of Wasserturm Water Tower Mannheim. Our park is a forest, a faraday cage, a butterfly garden, and the protective veiling of various multi-purpose platforms and courtyards that can be considered flexible in four ways: 1. the space is inherently flexible in use,

A LIVING STRUCTURE, A WILD SOLAR FOREST

SOLAR MESH

TECHNOLOGY:

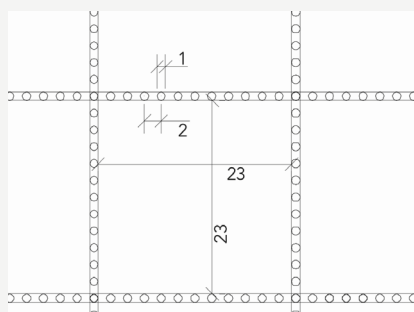
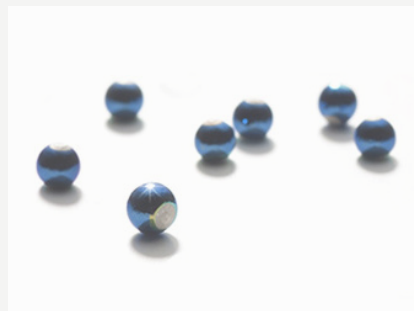
Woven open solar mesh incorporating multitude of micro spherical solar cells (flexible suspended canopy surface)

ENERGY GENERATED PER YEAR:

3,045.38 MWh

DESCRIPTION:

The suns position is always moving, and light does not fall uniformly (it is dispersed and reflected by the environment). Spherical solar cells, such as those developed by 'Sphehar', are able to receive light from multiple directions. This opens new possibilities for a large solar array to be both a flexible curved surface, and also a surface that may change formally over time. Micro engineering of such solar cells, to around 1mm diameter, may be incorporated into a woven mesh designed for maximum transparency (in our design this is a 98.4% open mesh).



MICROBIAL FUEL CELL

TECHNOLOGY:

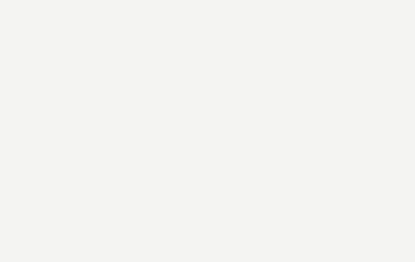
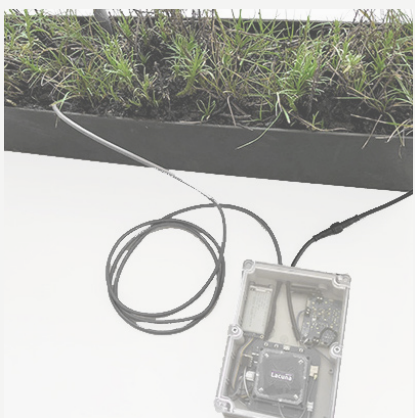
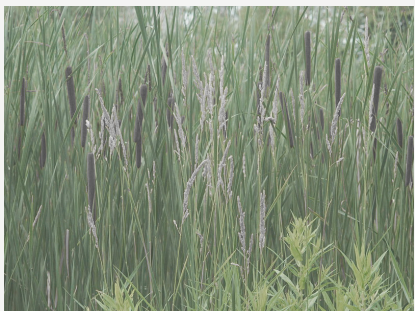
Plant microbial fuel cells and urine powered microbial fuel cell public toilets

ENERGY GENERATED PER YEAR:

39.42 MWh

DESCRIPTION:

Plant microbial fuel cells are a bioelectrochemical system that integrates the photosynthetic reaction from living plants to generate electricity via microorganisms at the rhizosphere of the plant roots. The fuel cell essentially uses organic matter in the soil as fuel, converting solar energy into electrical power by using microorganisms, which degrade root exudates and pollutants at the anode and pass the electrons to acceptors at the cathode. Further, human waste such as urine contains organic compounds that can also be utilised as fuel for a microbial fuel cell system, along with disposing of the waste from toilets.



GENERATE + REDUCE

FARADAY CAGE

TECHNOLOGY:

Woven open 'faraday cage' mesh blocking electromagnetic radiation through enclosure (as part of the solar mesh canopy)

ENERGY REDUCED PER YEAR:

6.72 MWh

DESCRIPTION:

A faraday cage is essentially a container, or a shield, that blocks out electromagnetic radiation from across the electromagnetic spectrum, such as radio waves and microwaves. A faraday cage can be made of any material that can conduct electricity, such as a wire mesh, and is perfect safe with a grounding wire. The mesh can be fine and thin, and engineered to be open whilst also blocking phone signal and access to the internet. A faraday cage will block the entry or escape of electromagnetic fields, meaning both downloading and uploading to the internet from smartphones for example. A faraday cage may also be designed to block particular frequencies and radiation harmful to insects such as butterflies.

DISCONNECT ONLINE TO RECONNECT OFFLINE

LIVING STRUCTURE

TECHNOLOGY:

Living willow structure (supporting the solar canopy) recycling and remediating the horticultural waste of BUGA 23

CARBON REDUCTION:

Carbon sequestration + significant reduction of embodied-carbon

DESCRIPTION:

Installing energy generating technology such as solar panels, usually requires the construction of energy expensive steel framing and concrete foundations. Alternatively it can be possible to engineer living plants as an architectural structure. The advantages are multiple; instead of a carbon cost, plants and trees provide carbon sequestration and are a natural and renewable resource; growing a structure reduces many energy costs and waste involved in manufacture and transportation; a forest or garden provides habitat for flora and fauna, and contributes to biodiversity. Willow structures and sculptures have a history and culture in Germany, not unlike the culture of creative cultivation of the schrebergarten.

