**Flower-farm**

In the context of a fast-developing world is fundamental to keep practicing human values and respect the natural rhythm of the earth. To give nature its time to grow and transform, to respect the slow speed of it, to be patient, remembering that we as human being have our own natural time as well and we need to sometimes get calm and slow down a bit, to recharge and enjoy the nature and all its wonders: just a few things we should do more often in order to go toward a brighter and cleaner future, closer to the nature. We could do these things somehow by relying on interactive and engaging devices which connect us with nature and energy: technology and nature in a relationship of symbiosis, serving the well being of people. God’s creation and human’s creation acting together in order to provide a safer, cleaner, more abundant world for the human kind. This could be the standard of performance of the future technologies. Moreover, technology shall be as accessible and engaging as possible: the forms of it could provide an interactive a wide variety of interaction so that the human being, regardless the age, culture, should be given an educative and engaging experience which connects the human being with the nature and the world around.

We find ourselves in this phase of transition between the world of separation between the artificial world and the nature and the future world of a greater symbiosis between nature and technology based on renewable energy resources, a cleaner, more peaceful and greater future. As a rudimental act of this transition, the project proposed is a trial of blending technology and nature providing some sort of interaction and educational material.

The main concept of this artwork is the flower. However, unlike the natural flower, the petals of this device are supposed to get the resources as a leaf and a root does: absorbing the sun light and collecting the rain water, stimulating the growth of its green parts and proving a humble shading device in the landscape. These petals are to be made of a smart organic photovoltaic material, which can be of different colors and be folded in a wavy shape, to provide a bigger absorption surface.

Its leaves are defined by the plants which people can grow as they want: flowers, aromatic plants, all sorts of little vegetables and fruits. All these shall be planted in the supports which can be arranged upon the needs and willing.

The flower’s stem provides the space for energy flows: water and energy: flowing up and down upon needs: the minimal stem provides space for water collection tube, for a tube for watering the flowers with water from the storage tank through a pump, and space for electric circuits.

Instead of roots, this flower has a base which provides storage space for water, electrical energy, as well as it can be a good sitting place and some more space for planting pots.

The base and the stem are to be made of *rectangular shaped elements* (8 cm: 23/ 47 cm) which can be of recycled wood and connected one to another as a 3D puzzle or Lego game. The construction idea provides three examples of 3 main different possibilities of design: 3 different sizes which provide various quantities of storage.

The main ***technology*** used in the project proposed is the organic semi-transparent photovoltaic material, made of ST-OSCs (semi-transparent organic solar cells). This technology contributes to the new agrivoltaic greenhouses industries. It is scientifically proven that this material is able to improve the growth of better characteristics of a plant. As it is a semi transparent material it can be of different colors and its transmission spectrum can not only support healthy plant growth but may be used to promote gene expression in crops for desired characteristics. Along with relatively high power conversion efficiency, its spectral tunability is the key strength of this ST-OSCs material. As energy efficiency, the organic PV cells are known to be competitive with the crystalline silicon. [Organic solar cells](https://www.pv-magazine.com/2021/09/16/semi-transparent-organic-solar-cell-for-window-applications/) based on [non-fullerene acceptors (NFAs)](https://www.pv-magazine.com/2020/02/14/new-non-fullerene-electron-acceptor-for-17-efficient-organic-solar-cell/), are the most powerful organic PV devices ever developed to date, with efficiencies exceeding sometimes 18%. Another advantage is that its manufacturing cost can be reduced due to their lower cost compared to silicon-based materials and the ease of device manufacturing.

In terms of ***public activities and social co-benefits***, this artwork supports all sorts of stationary activities: staying for waiting, or for a talk, or for a meeting in the street or in a park, anywhere the project could be placed. It could become as well a good talking subject on the technologies of the future as it is something out of common, so it would provide a conversation between passing people.

According to the three sizes proposed, the artwork could provide, per 1 piece, per year:

* 51$m^{2}$ of OPV petals: 7,7 ***MWh/ year***
* 16$m^{2}$ of OPV petals: 2,4 MWh/ year
* 9$m^{2}$ of OPV petals: 1,3 MWh/ year

Supporting ways of the ***sustainable development UN goals*** of this device could be:

-providing a great absorption of sun power into electrical energy as long as the device is used, reducing the reasons of poverty

-provides a support of growing food as a fight against hunger

-could be a well being tool, as it provides shade and a bunch of flowers to enjoy

-contributes to the education as kids can learn about the wonders of nature just by observing the device along the nature transformation of rain, sun

-reduces inequalities of all sorts by providing a sitting and stopping shaded place for gathering and communication

-provides a form of water collection and storage

-it provides affordable and clean energy through the use of the ST-OSCs material, cheaper than classic photovoltaic devices

-contributes to an economic growth

-contributes to the innovation of industries, by encouraging the photovoltaic agriculture

-made of recycled wood and economic organic PV materials, providing clean energy and water storage, contributes to the sustainability of cities and communities

-it is a small part of climate action

In terms of ***environmental impact***, some aspects could be noted:

* The impact on landscape: it takes into account the site’s visual field, not disturbing more than a street lighting post; it doesn’t block the air flow and local winds, as the petals provides space for the wind to blow and its linear shape of the stem acts as any tree trunk; it supports as well the night lighting function
* The noise impact: as this device has no turbine or generator, its impact is limited to the moments when the water pump works for watering the plants
* The impact on the surrounding ecosystem: this artwork has an negligible effect on local flora and fauna