**UPLIFTING**

RETURN TO THE SOURCE

**Idea**

The design of the Public Art “Uplifting” consists of 7 hands that support the shell-mashrabia frame. 7 hands symbolize 7 emirates,

which each develop their own particularity, but at the same time, feeding each other for a general advance. In addition, 7 hands

personify (which is justified by functions in space) 7 main Innovation Priority Sectors of Abu Dhabi.

**Strategy:**

The activation and increasing livability of the space is carried out due to its functional filling with traditional functions and the addition of new functions necessary to

improve the quality of the urban environment. Improving the quality of the urban environment is achieved by filling it with various places associated with the optional

urban human activity, namely, with rest, communication, free pastime.

There will be city festivals and active everyday city

life, for which it will be interesting to watch sitting with a cup of coffee in a coffee shop, on an open terrace or amphitheater near a fountain or green oasis. If you want,

you can take part in the city performance yourself, read a book in the street library, walk through the shops - workshops, talk with local people, try yourself in master

classes in traditional handicrafts. For lovers of active recreation, there are places for playing ping-pong. Having plunged into this urban performance, you can feel the

spirit of the place. And the resulting bright positive impressions of staying in this city and communicating with its residents will cause a desire to return to it again.

**Technologies used in Public Art:**

**1.Organic Solar Panels (OPV)**

Organic solar panels such as HELIATEK (Germany) are provided by the project on a 50% openwork roof made from recycled aluminum obtained from cans.  
The area occupied by solar panels is 11160 m2.  
The average electric power produced is **326 kWh** per day, or about **119 MWh** per calendar year.  
  
The advantages of using organic solar panels:  
- low dead weight with a thickness of only 1 mm and an efficiency of 15%;  
- great flexibility of elements with a sufficiently large coverage;  
-low cost of production of panels, the use of equipment for roll printing;  
- low selling price of organic solar panels - about 30 Є / m2;  
- insignificant impact on the environment with excellent payback.  
The resulting electrical energy from organic solar panels will allow you to perform the following tasks:  
- illumination of the entire public space zone in the evening and at night and for the operation of fountains engines, watering plants, a cafeteria ~ 60 kWh;  
-Power supply 2 pcs of ground-water heat pumps of type NIBE F1155, 16 kW for heat / cold 2 x 12 hours x 2 = 48 kWh (12 hours per day are used, heat pump power consumption and circulation pumps of loops 2 kWh) ;  
- the remaining power received on the day (326-60- 48 = 218 kW / h) can be used to illuminate the neighboring houses or accumulate lithium batteries  
  
The cost of OPV panels is 11,160 m2 x 30 x 1.15 = **385.020 Є**

**2. Heat pumps soil-water**

To cool the rest areas around each arm, cold loops of cross-linked polyethylene pipes in the screed are used to reduce the air temperature of these zones locally by 10 degrees.  
  
The project envisages the installation of 2 – x heat inverter pumps of the NIBE F1155 type, 16 kW (Sweden), each providing four cold zones around the supports, with a total floor area of ​​2 x 4 x 400 m2 = 3200 m2.  
   
Heat pumps along with distribution manifolds are placed in the inner space of two hands-supports (in one of a group of four hands-supports).  
  
The maximum cooling / heat output of each heat pump is 16.9 kW.  
Cooling capacity of 2 heat pumps - 2 x 16.9 = **33.8kW**  
Average power consumption of pumps - ~ 2 x 2 = 4 kW  
Average SCOP = 5.2.  
  
The removal of the cold of the ground by each heat pump occurs through a brine collector embedded in the ground at a depth of 2.5 meters from a special black polyethylene pipe  
d = 32 mm, 750 meters long, laid in increments of at least 1 meter on an area of ​​30x30m.  
  
The cost of heat pumps and wiring with work - about 2x20.000 = **40.000 Є**

**3. Piezoelectric flooring**

Piezoelectric floors are designed to convert the kinetic energy of steps into electrical energy.  
  
The project provides for the use of a kinetic track of 2400 pieces of piezoelectric tiles of the firm PAVAGEN SYSTEMS Ltd (England), having the shape of an equilateral triangle with a side of 50 cm.  
  
The tiles are installed in the most active place of pedestrian traffic - on the bridge.  
The dimensions of the area with kinematic plates laid 8.66 x 15 m (W x L) = 129.9 m2, which exactly correspond to 1200 tiles.  
  
The tiles are made of flexible waterproof material resulting from recycling used tires. The base profiles for laying tiles are made of special recycled stainless steel.  
  
The energy produced by one tile at one step is 3 J = 3 W x s., Which means that in order to obtain a power of 3 W.h., a pedestrian traffic flow of about 50-60 people per minute is necessary.  
  
Assuming the time of active movement of pedestrians across the bridge in the amount of 4 hours, with the above calculations, when acting on all the kinematic tiles we get  
the theoretical power obtained is 3 x 1200 x 4hours = 14.400 Wh.h = **14.4 KWh**. For more accurate calculations, it is necessary to apply a special program of the tile manufacturer with the ability to accurately determine the number of clicks on tiles through the signals of the LED built into the product.  
  
The cost of the kinematic tiles system is 130 m2 x 600 x 1.16 = **90.480 Є**

The decision to install kinematic piezoplates on the bridge is an absolutely logical and reasonable decision, given the possible large pedestrian load in this place. If necessary, you can reduce the laying area of ​​kinetic tiles, which will reduce the cost.

**4. Lithium-ion batteries**

A BYD B-Box 5.0 rechargeable battery (power 5 kW) is provided in Uplifting. It is a product of energy storage and a reliable lithium-iron-phosphate battery, which can be used as a power storage device in autonomous and emergency power supply systems.  
Modular design provides installation flexibility. It allows you to install up to 1/2/3/4 pcs. battery modules inside one cabinet.  
The B-BOX system has the ability to increase the capacity of the capacity by parallel connection of battery cabinets.  
  
Features of the B-BOX system:  
- Flexible capacity configuration;  
- Parallel connection support system;  
- Modular design;  
-Installation for own consumption;  
-Commercial and industrial installations for smoothing peak loads;  
  
Battery Features:  
- Long cycle life - up to 5000 charge-discharge cycles;  
- No pollution for the environment.  
  
The cost of lithium battery 5kW - 5630  
The cost of lithium batteries at the rate of (218 kW + 15kW) / 5kW = 46 pcs  
                                                 46 pcs x 5630 = **258.980 Є**

Used to store excess solar energy derived from organic solar panels. Place in the internal cavities of the support arms. Because of the fair value   
it was decided to abandon this type of elements, and to drop the surplus energy received from renewable sources (the sun) to illuminate the neighboring residential buildings and offices.

**Uplifting using the received solar and kinetic energy for:**

- illumination of the territory of public art,

- for the operation of a heat pump for cooling the floor of the territory of public art,

- for the work of pumps for fountains,

- for a system of watering plants in the territory of public art,

- for illumination of adjacent buildings and public buildings

**Basic materials in design**1. Supporting frame of the hand structure - recycled steel, ferrous metal, 3 tons x 8 = 24 tons  
    Cost 24 x 1000 Є = 24.000  
  
2. Covering of support-hands - recycled stainless metal, sheets thick  
    2-3 mm, 1900 m2 polished  
   The cost of 1900 m2 x 90 Є = 171.000  
  
3. Stone for paving, local materials, 20 mm thick - 13630 m2 x 1.05 = 14312 m2  
    rough  
   The cost of 14312 m2 x 20 Є = 286.240 Є  
  
4. Stone for benches and seats of the amphitheater, 30 mm thick - 2550 m2 x 1.1 = 2805 m2  
    polished, local materials  
   The cost of 2805 m2 x 30 Є = **84.150 Є**

**Environmental impact**  
  
The finishing materials which are used are mainly of natural inorganic origin. This applies to polished or rough local stone materials. For the production of metal structures and coating of support-hands, as well as roof structures, kinetic tiles, recycled materials are used, the production of which takes much less than the primary energy and produces significantly less harmful substances and CO2. Solar panels are basically natural organic materials.