**ENERGY HIVE**

The natural system of bees working in choreographed synchronization to harvest and produce for the benefit of the collective has provided meaning for the **Energy Hive**. Our installation metaphorically extracts the beehive structure, expressed as a sculptural arc of orbs, to construct a new interactive renewable energy hive.

The energy hive system is a harvester of sunlight, tracking the radiant energy of the sun’s rays as the sun moves across the sky during the day. The harvesting of this sun energy is exponentially multiplied by the collective orbs and stored within the two **anchor pylons** at each end of the hive arc. These anchor pylons are also points of distribution for the collected energy. Thus, the two anchors serve two pivotal purposes: first, the primary structural tension support for the system of cables supporting the **orb units** along the arc, and second, the anchors house the system of converters, transformers and mechanical devices that feed an expansive underground distribution network.

The genesis of the Energy Hive is both environmentally and sculpturally conceived to inspire maximum energy capacity and visual beauty. The south facing outer face of the **arc of orbs** is oriented based on maximum sun exposure for the Denmark site.

The 1.8m diameter Orb Unit uses a water-filled, acrylic-polymer spherical lens to concentrate sunlight on a small multi-junction or standard silicon photovoltaic cell. A dual-axis pivot is integrated into the support structure enabling the lens to track the movement of the sun. The unit is linked to the tracking system by using an optical tracking device powered by a low inertia DC motor and a LED positioning control unit. The Orb unit has a 3.4kWh maximum capacity per day and a battery capacity of 5.4kWh. The Arc contains 348 orb units and has a total capacity of 1183 kWh.

By choosing the spherical lens as a solar concentrator the unit is linked to the tracking system using optical tracking. This advantage has the capability to integrate the tracking system. The combination of concentrating solar power and a dual axis tracking allows adapting any solar converter / receiver technology.

At 16.4 meters high and 119 meters wide­, the arc itself is based on the rotational movement of the earth around the sun. At the ground level of the Energy Hive, human engagement and education about the energy producing installation is provided via two levels of program: the **Education Path** and the **Reflecting Pool**.

The Education Path traces the form of the Energy Hive through a ramp system that brings the viewer in safe close proximity to the arc of orbs and affords dynamic views of the city and landscape beyond. Educational information on both the installation and the energy capacity are housed within the walkway surface and become digital readouts during the day and fiber optic displays after sunset. The sculptural quality of the installation is enhanced by a self-sustaining fiber optic lighting display within the orb unit cable support system, which will read as a lighted hive from within the site and from afar at night.

The Reflecting Pool gives sculptural meaning to the seemingly infinite system of the orb units and the metaphorical sense of endless renewable energy production for the benefit of the collective – humans. The shadows of the orb units reflecting in the water will also remind users of the power of the sun as a source of harvested energy. The pool is shallow and will allow for play and cooling comfort during the warm seasons and winter activity such as ice-skating during winter months.

The Energy Hiveserves as a powerful energy generator, an arc of sculptural simplicity and beauty, a beacon of human ingenuity, and a space of human interaction and play.

**Energy Hive Environmental Impact**

The Energy Hive lands lightly on the surface of the existing site without the need for major excavations or physical disruptions. The primary system of structure for the energy hive is a tension cable system that is anchored to ground by major concrete pylons. The structure is additionally supported by vertical and diagonal post that equalizes weight distributions. Support footings for each of these vertical and diagonal supports do not visually obstruct views in and around the hive structure. Thus, the physical environmental impact on the site is negligible and visual environmental impacts are eliminated due to the open and transparent of the cable system and the glass orbs used for energy harvesting.