POSILITRE

Introduction and mission statement

In the age of population increase and progressing climate change, sustainable resource utilization has never been more important. Masdar is the leading developer of sustainable urban communities, and POSILITRE is believed to bring even further positive contribution to this city of the future.

Current water desalination plants are isolated by the coasts as bulky factory looking systems. POSILITRE transforms ocean water to the ultimate humans’ source of survival, in the proximity of civilization. While saline water make up 97% of all the water on Earth, only 2.5% is fresh water. Furthermore, water does not come free, nor does it come without utilizing large amounts of energy. It is an important concept of POSILITRE to emphasize and educate the importance of how water is a limited source, and demonstrate the capability of technological advances of desalination. POSILITRE eliminates reliance on heavy energy usages, and creates a sense of familiarity and awareness of water distribution among people by placing these desalination plants right in the heart of communities.

Design feature

POSILITRE is a highly functional water desalination that is designed to be a part of people’s lives. With panels that regulate the inside environment and (LED MATERIAL) that lights up at night the area is accessible and a place for anyone, anytime.

Current water desalination systems are bulky square and container shaped. Factory-like systems such as those give an impression of not being relevant to the daily routine, when in fact it is the very source of our ability to survive.

Aesthetics being an important factor to catch the attention and interest of people, Masdar’s culture characteristic of having many geometric patterns inspired POSILITRE’s geodesic dome origins. Not only is the dome shape for looks; it is proven to be highly functional as well. With no ridges, the dome shape does not trap nor receive the effects of wind, it is unlikely to be damaged by hurricanes and typhoons. Furthermore, the dome is uniformly distributed along the entire surface, effectively distributing the load. It does not require any internal load to support the walls, and overall much less material is required than traditional buildings.

Polycarbonate glazing panels regulate the inside environment, resisting breakdown by ultraviolet light, and allowing 65% light transmission. The solar powered central air system effectively cools and regulates the air flow and temperature, making it a comfortable environment in any weather condition.

Sound proof panels are placed to reduce sounds from the desalination plant, and to increase comfort and create a relaxed ambience for the community space.

With the desalination system placed in the center of the space, dimensions allow 2.5m distance

(DIMENSION OF THE RO)

A significant part of POSILITRE’s function come from its original source of energy. While the energy required to function the desalination process is effective enough to require little energy, solar panels placed on POSILITRE are efficient in installation with its flexible and think panels, and reduces installation cost. They are durable, portable and easy to handle, effectively harnessing the sun rays to operate the system without relying on electricity from the grid. POSILITRE is completely self sustainable.

Community space

Being apart of the community and bringing people closer to the process of providing water is a significant concept for POSILITRE. Inside the dome, there are chairs and tables that

Being a dome shape represents inclusion of people, alongside with the notion of totality, wholeness, eternity, and timelessness. The community space POSILITRE provides integrates a part of one’s lifestyle, space, and time.

Process

Water is pumped from the sea 1.6km from Masdar. The pump carries water to the desalination plant and the inland, allowing POSILITRE to function not only by the coasts but in proximate distances to communities and cities as well.

Once the water reaches to POSILITRE, it will go through a reverse osmosis process. Reverse Osmosis is a simple desalination process that effectively removes pollutants from water, when forced across a semi-permeable membrane. The contaminants are flushed out, while the clean drinking water is delivered through the pump. The reverse osmosis system has very few moving or replaceable parts, making it simple to maintain with low costs to set up. It requires low energy to process water, and with POSILITRE’s use of self generating solar panels to operate, the RO system is 75% more energy efficient than the thermal desalination technology that are used in UAE. Furthermore, the technology has minimal use on chemicals, making it a safe and reliable process to produce drinking water. Approximately 28412m3 is to be produced, and with the envision to set 30 systems in Masdar.

Environmental impact

Population increase equivalates to the increase in demand for water sources. Attempting to make the ends meet in the same method with how water has traditionally been obtained, will result in further more energy consumption. As an alternative from using up more valuable water and energy consumption POSILITRE commits in leaving minimal environmental impacts. The system reduces an annual energy consumption of 157.500.000kwh. With only a reliance on renewable energy, no carbon dioxide is emitted. The future of water provision is self sustainable, and does not generate greenhouse gas emissions.

Resource generation

Eletric-generatingcapacitiy(In UAE 1㎡)

2000kwh/yr=About 4.5kwh/day with a panel area of 4710㎡（5・5・3.14・4・30/2）, resulting in a total of 21195kwh.

List of primary materials

* RO desalination system
* Polycarbonate panels
* Solar sheet panels
* Noise reduction panels
* LED lights