**LUCIDITY**

We envisage a joyful colourful light filled destination, which is arrived at by bicycle, water taxi or other small boats.

There are six tall bright glass towers, which will provide a visual focus and entice visitors to LUCIDITY. They will harvest solar and wind energy. The transmitted colour will provide an intriguing and alluring pattern on the ground, around and within each tower and the covered walkway.

Each 40 metre tall tower supports a 20 metre diameter rotor. The towers are staggered in accordance with computational fluid design analysis to best utilize the available wind.

An important element in the technology is the use of fuel cells, which act as batteries and even out the power generated.

Fuel cells are a Welsh invention (William Robert Grove 1842), which are on the cusp of a global impact to deliver clean energy in applications ranging from cars to buildings on an industrial scale.

Fuel cells can by-pass the need for a clumsy grid and bring much-needed electricity to the developing world, in much the same way that mobile phones have by-passed landlines.

Fuel cells can release the full potential of renewables and can be deployed at all scales in all places: urban or rural; developed or developing world. This universal application is one of their great strengths in addressing climate change and also air quality. Hydrogen storage at the site will allow the fueling of boats and vehicles, including the water taxi.

The power rating of each of the 6 turbines will be 100kW, giving an estimated total output of 1,500,000 kWh of electrical energy per year.

The plan also allows for 50% of the south facing glass cladding of the wind turbines, and also the glass roof area of the walkway to the water taxi, plus passenger shelter, to incorporate perovskites. This will mean a total of about 1000 square metres of electricity producing PV cells giving an annual output of about 60,000 kWh.

Some of the total output of electricity from the wind turbines and PV cells can be used to electrolyse water, producing hydrogen. This can be used to generate electricity (and heat) in fuel cells to partially meet consumer need for electricity during periods of low wind.  The hydrogen can also be used as a vehicle fuel, e.g. for the water taxi and, increasingly in future, buses, trucks and cars.

A covered glass walkway creates a route to the water taxi and a colourful celebratory arrival point for visiting the site and its many pathways.

The towers and supports for the structures will be marine grade stainless steel. The foundations will be low environmental impact concrete.

Perovskite solar cells are embedded into the toughened and laminated glass skins of the towers and walkways. Additional colour is provided by silk screen printed enamel frit. The environments within and around the walkways and towers will be luminous glowing fields of colour. The changing patterns of light throughout the days and seasons will allow constantly evolving experiences for visitors to the site.

At the base of every tower there are especially designed seating places for experiencing soundscapes and music created and recorded within Copenhagen by artists and composers.

**Environmental Assessment - Biodiversity Value and Impact**

The site contains no habitats or species that are of national or European biodiversity importance. The site is post- industrial containing contaminated land, it has developed a grassland habitat which is of local bio-diversity interest, supporting breeding birds (such as skylark), reptiles and invertebrates that favor open mosaic habitats..

The footprint of the turbines and covered walkways is 1,050 square metres. Loss of habitat will be negligible and compensated for by biodiversity enhancements.

The tendency of wind turbines near coasts to impact migratory birds is mitigated by the industrial setting and surrounding buildings

Once construction is completed the biodiversity of the site will be enhanced by: planting shrubs to provide roosting cover for migratory birds, creating reptile hibernation sites (piles of stones), scrapes/shallow ponds for birds and amphibians.

Biodiversity Conclusion: Net gain to biodiversity

Construction

It is estimated that the construction phase will take 6 months (all components fabricated off site)

Temporary disturbance to nesting birds during construction will be short term. On completion the site will have an enhanced biodiversity.

Construction will take place between August and March to avoid disturbance to breeding birds.

Reptiles – Careful dismantling by hand of reptile habitat subject to site study.

Marine

Not applicable

Pollution

Once operational the turbines will not produce pollution, during construction noise, air, light and vehicle pollution will be kept to a minimum.

Sustainability

Wind turbines recovery the carbon used in the construction within 10 months; carbon payback for PV is 2 years, both generate power for 20 years. Payback for fuel cells is 2 years.

Social

The turbines will produce energy for homes in Copenhagen and create a green area for people to enjoy the artwork, nature and the heritage of the docks.