KINETICART GENERATORS

Concept

The kinectart generator concept is essentially a combination of the seawind farm (wind-tidal energy off shore generators) and the windscape on the land (onshore wind generators).The windscape is wind farm inspired by the wave forms to form a dynamic, natural, undulating landscape that can be used as a public space for recreation and observation while generating electricity from wind turbines installed at its apex.

The concept 'seawind' generator inspired by seaweed and came about in response to maximizing the total energy output offshore by both wind and tidal energies. Insofar as the seawind concept utilizes the different kinetic energies while integrating with the surrounding landscape to form dynamic public spaces for recreation and social interaction.

Our project consists of 200 seawind stalks, 5 meters long, anchored to the floating pad with recycled aluminum and steel framework bases with air pockets evenly distributed radially and that are 20 meters in diameter. The seawind stalks are made of carbon fiber reinforced resin poles, 30 cm in diameter at the base and 5 cm at the top. The upper extension are 1500mm tall with a 50 cm top on the poles that are lit up by an LED lamp that glows and dims depending on how much the poles are swaying in the wind and tide. Since in incorporates both wind and tidal technology it is very unlikely that it dims out.

Within each hollow pole is a stack of piezoelectric ceramic discs. Between the ceramic disks are electrodes. Every other electrode is connected to each other by a cable that reaches from top to bottom of each pole. One cable connects the even electrodes, and another cable connects the odd ones. When the wind sways the poles, the stack of piezoelectric disks is forced into compression, thus generating a current through the electrodes. Within each concrete base is a hollow chamber that houses a torque generator.

Where a typical windmill converts wind energy into rotation, which powers a spinning generator that creates electricity, seawind stalks convert winds energy into electricity by harnessing the strain and flex of its stalks. In theory, the seawind pads should be able to produce about as much electricity with the utilized seafront as a traditional wind farm would, all the while loom, eel-like, under the water.

One problematic issue with Piezoelectrics is that as promising as they may be, have never been used on this scale. Successful deployments of piezoelectric generators have been relative modes. A jump to a large seawind farm based entirely on

piezoelectric carbon fiber tubes would prove challenging but a worthy course to pursue.

Technology

Wind energy and tide energy

Estimate of the annual kWh

Windscape :

Rotor diameter:4m

Windtamer 16.0(proposed) with enhanced wind technology

Sound:<25dB

Integrated wind lens technology

Wind speed:7.2m/s

Cut-in speed :4.3m/s

Cut-out speed:14m/s

Turbine efficiency;39%

Energy capacity:16MW

Seawind(wind-tidal generators):

Materials specification:

Landfill earth, recycled wood, recycled aluminium,paving backs

Environmental impact statement

The use of locally sourced materials, recycled materials will reduce the environmental impact on the site.

Conclusion

The seawind technology could turn offshore energy harvesting into a major renewable energy, while producing less noise and requiring lower wind speeds than a typical wind turbine. The flowing fibers could also add to the landscape and waterscape aesthetics. The design could be likened to an improved/upgraded version of the windstalk concept. Although current piezoelectric generators are only able to generate small

amounts of power, research is very promising. These include using nanomaterials and giving them the ability to work with a wider range of frequencies.

If the technology were sufficiently advanced to the point that piezoelectric power becomes a feasible large-scale energy source, this would be a great advancement in renewable energy technologies.