August 2011

WIND ENERGY DEVELOPMENTS

500 MegaWatt Wind Turbines

Wind energy is available all over the world. About one kilometre above our heads wind energy flows at a density of kilowatts per square metre. That energy is free. And it is green.

But present Turbines are too small to reach the height where the wind blows at speed. These turbines cannot compete with power stations for coal, oil, gas, or nuclear fuel.

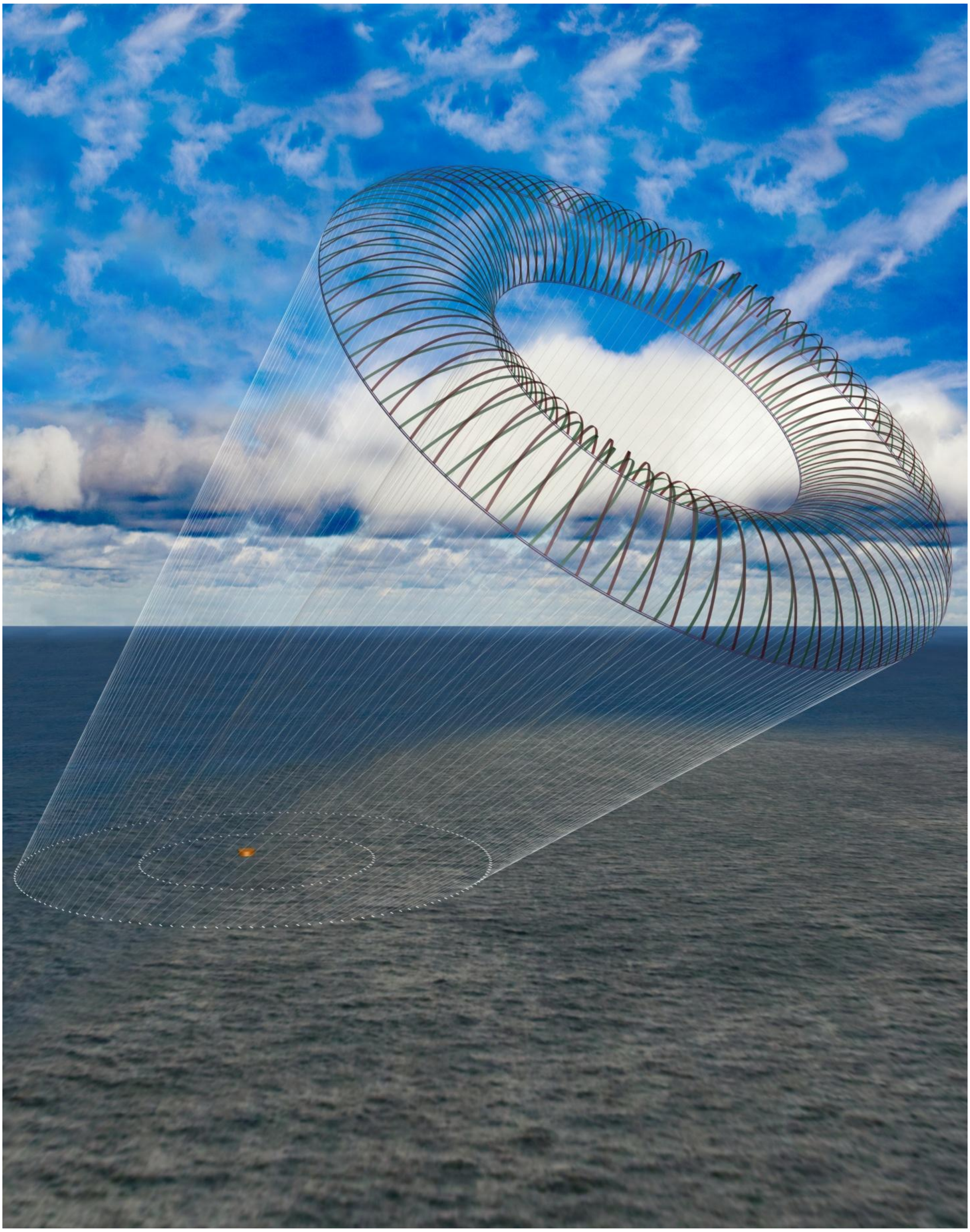
We design Wind Turbines for greater heights. We give them a capacity as large as that of conventional power stations. This will aid in incorporating them in existing electricity distributing networks.

Simply scaling up the conventional design of Wind Turbines is unfeasible. To name but a single issue: the towers required to hold up the Turbines high enough in the wind get too expensive.

Shifts in the design are needed. That is why our Turbine is designed to hover high in the air, like a helicopter. This approach is not in itself wholly novel. It has been described in general terms. Our development goes further.

In quite some detail we have worked out large, hovering Turbines for 500 MegaWatt power stations. The scheme appears to be technically feasible, and economically attractive.

We will outline the basics of the design which has been examined.



Wind Turbine 500 MW

Outer diameter: 1350 metre

Design basics

In our design the 500 MW Wind Turbines use two counter-rotating sets of sail wings. Their outer diameters measure up to 1350 metres. Their narrow sail wings, as shown, are much lighter than solid wings would be.

The wings are not interconnected mechanically. Their rapidly moving tips are guided by air bearings in wide support rings. These rings are held high in the wind by 2000 metres long tethers, connected to winches, floating in equal-sized circles on the sea surface.

Via those winches and those tethers the Turbines can be directed. They can be toppled, too, to follow the wind. The Turbines will then harvest more of the wind energy, or less.

This harvesting is done by a combination of electric coils and sheet magnets. The sheets are mounted along each wing tip. The rapidly moving magnets induce electric power in the coils, held in the static bearing rings. That power is produced at a high voltage.

At all times, for any individual coil the effective inductivity is controlled and, hence, its reactive force. This control is used to harmonize the speed of all Wing Tips. This harmonization keeps the induced voltage the same over all coils.

All induced currents are rectified straight at the coils. The resulting DC currents are combined into one flow of energy. That combined flow is brought by a sub-sea cable at high voltage to the Control Station on shore.

In that Station the HV-DC flow is converted to AC at specs fitting to those of the public power network to be addressed. Three-phase 380 kV, for instance. The Turbine can thus be integrated directly into the electric network on land.

At the installation, the Turbine acts as an electrically driven helicopter. It rises from the sea surface into the air. Or reverse: the Turbine can land for inspection and maintenance.

The fixed costs of these Turbines will be competitive with those of present 500 MW power stations. As for the variable costs: the wind, the source of the energy, is for free. As a result, the electric energy can be delivered quite competitively.

In the end, spread over the world, some 3200 Turbines could be implemented conveniently. That many Turbines would cover 20% of the local need for electric energy. In case of local wind calms the conventional power stations can fill in the gap.

When Turbines get interconnected via a High Voltage-Direct Current cable, the web of Turbines can take care of even more than 20% of our electric needs. Cost effectively and eco-friendly.

These qualities may open a great business opportunity for 500 MW Wind Turbines.