

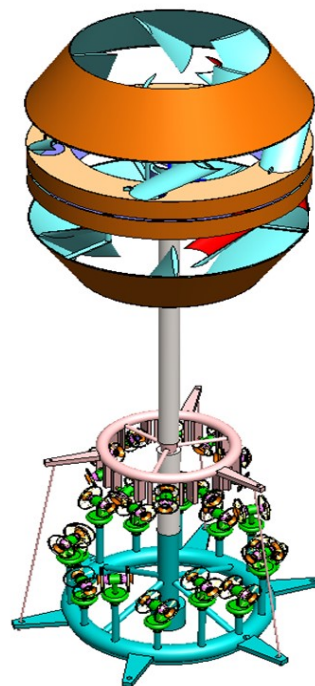
The ultimate Ocean Renewable Energy Machine

The ultimate 21 first century American energy weapon

This invention (US Patent 11441540, 11428211) relates to an ultimate renewable energy machine, an all-depth offshore turbine system with a disruptive methodology and innovative technology, which changed 150 histories of the turbines. The true turbine system is a volume-based power system (Kw/ M³) instead of the current area-based power system (Kw/M²) decentralized power systems to provide power where customers are located and greatly reduce transportation and transmission cost unlike the fossil power system or gigantic wind turbine farms and has a top wind turbine subsystem, a middle wave turbine subsystem with solar panels and a bottom tidal turbine subsystem with efficiency beyond Betz limit 59%, the turbine system includes a breakthrough turbo-technology with robust shaft-less twin rotors and dual -power zone blade structure to harness all ocean energy in a synergic manner or individually, this system has all-season safety features for birds, marine life, human, and itself, is modularized and scalable for low LCOE < \$0.10 kWh and provides reliable electricity 24/7, If the steam engine brought us the industrial revolution, then this quintessentially American secret weapon would bring the USA to the top of the world for the 21 first century energy revolution and be the ultimate fossil energy alternative.



Ocean renewable energy machine has syndetic subsystems and scalable design



Hurricane proof wind turbine subsystem,



**Wave turbine subsystem/
Solar panel as a float base
to support the wind turbine**



**Tidal turbine subsystem
as a bottom base to support
wave and wind turbines**



**Fluid Dynamics System LLC, Houston, TX, USA
sales@fds-valve.com , jshu23@yahoo.com**

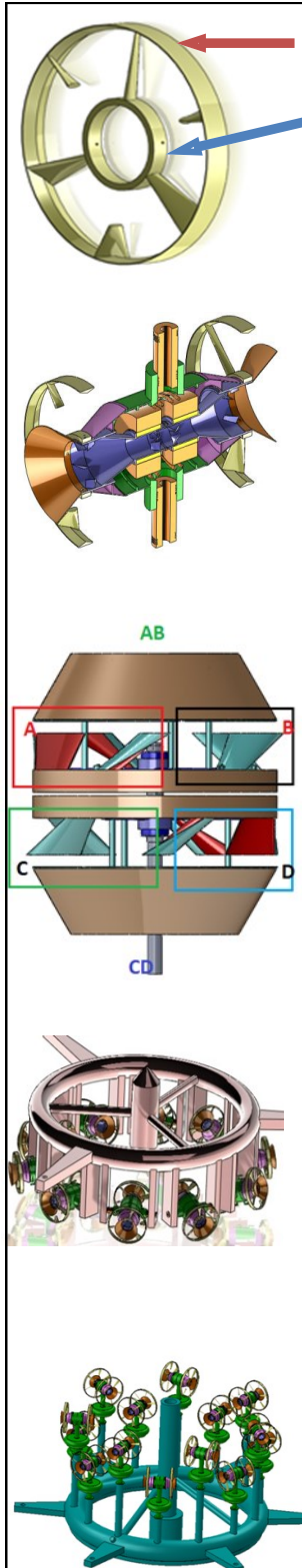
The ultimate Ocean Renewable Energy Machine

Global challenges

1. **Low Efficiency.** Since 1919, German physicist Albert Betz declared that the limit for the theoretical maximum efficiency for a wind turbine is 59 % or a factor of 0.59 , all blade centers block more than 20 to 30 % flow areas, multiple conversion between turbine blades and generator shaft reduce the efficiency by 30%
2. **Low power density.** All existing turbines are an area-based power systems with ever larger diameter blades occupying larger and larger footholds; as a result they generate very low density power. The area-based turbines not only have low performance (Power/M²)
3. **Safety issues** broken blades injected people , electrical fire and to birds kill and noises.
4. **High cost,** The world's wind turbines based on the last century technologies get bigger and bigger for performance efficiency but with high cost and can not sustain high inflation , the wave and tidal turbines never were commercialized , because those turbines are lack of synergy , scalability and breakthrough technology , too many moving parts and cannot sustain violent wind, waves and tides

Fluid Dynamics System
 LLC, Houston, TX, USA
 sales@fds-valve.com ,
 jshu23@yahoo.com

Solutions Of the machine to meet the challenges



1. **Blade :** High power zone with bigger diameters and more blades , lower zone with less blade and smaller diameters , the efficiency and strength increase by 25 %.

2. **Turbine with Single conversion** between turbine blades and generation shaft , Front and back blades generate double areas with high density power without yam control , external blades and inter blades generates vortical affects , so the virtual swap area increase by 15 % more without even creasing blade diameters

3. **The vertical wind turbine for hurricane prone states** has a pair of top and bottom vertical rotor assembly, and rotates clockwise and anticlockwise and is connected with a tower adaptor with internal four blades. Incoming wind is divided into four streams inlets A, B,C,D and two outlets AB and CD

4. **The wave turbine subsystem** has a floater assembly and multiple wave turbines engaged with the floater assembly rotating freely around 360 degree by hinges of the floater assembly and hinge pins of wave turbines, so each wave turbine produce electricity .

5 **The tidal turbine subsystem** has a base to support the wave turbines and multiple tidal turbines engaged with the support cylinders for rotating freely around 360 degree , so each tidal turbine constantly produces electricity .