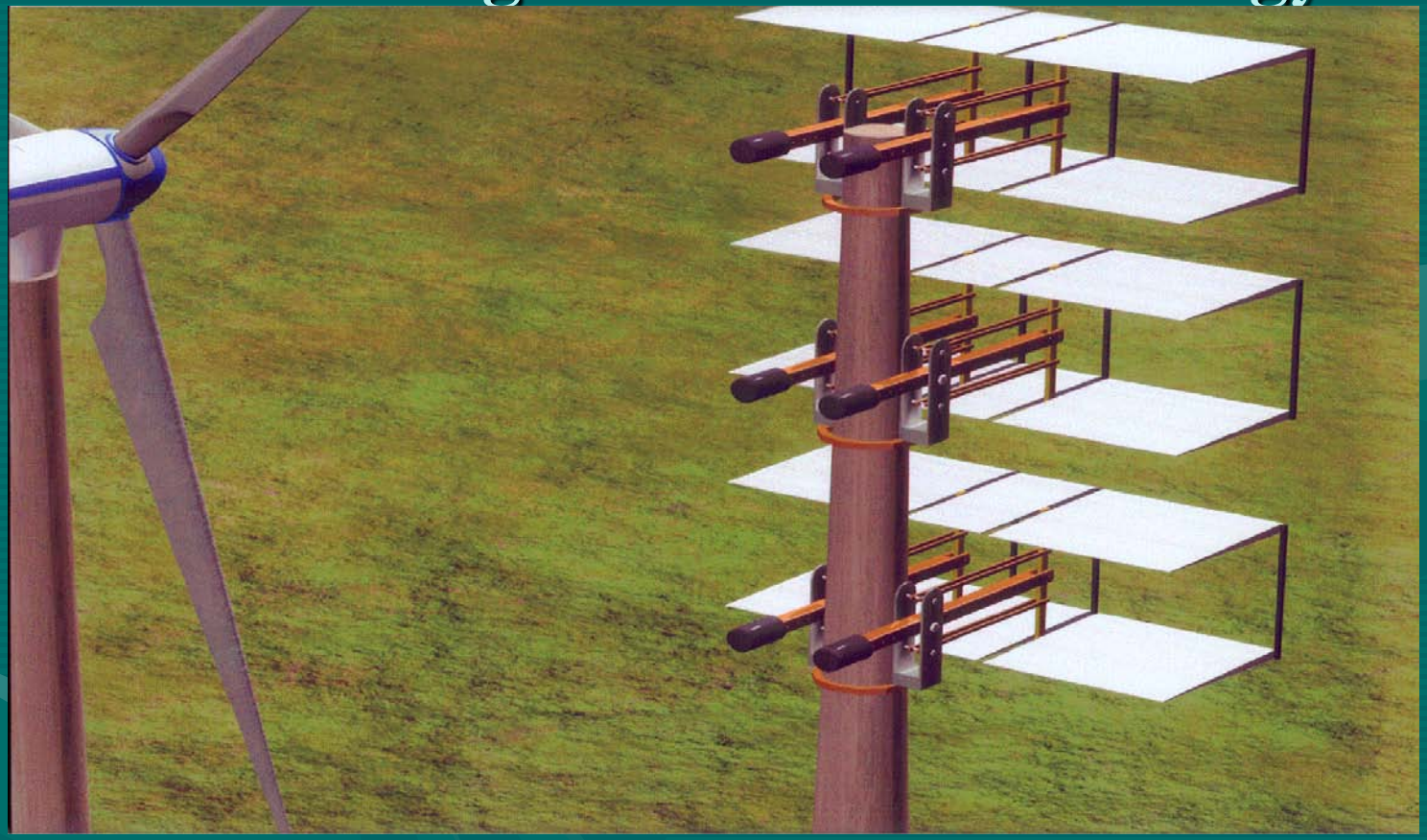
A New Technology
for
Harvesting Wind and Water Energy



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Patent granted 12/15/2009

The Corporate Goal : Creating a Balanced Technological System

100% Efficiency is the Objective

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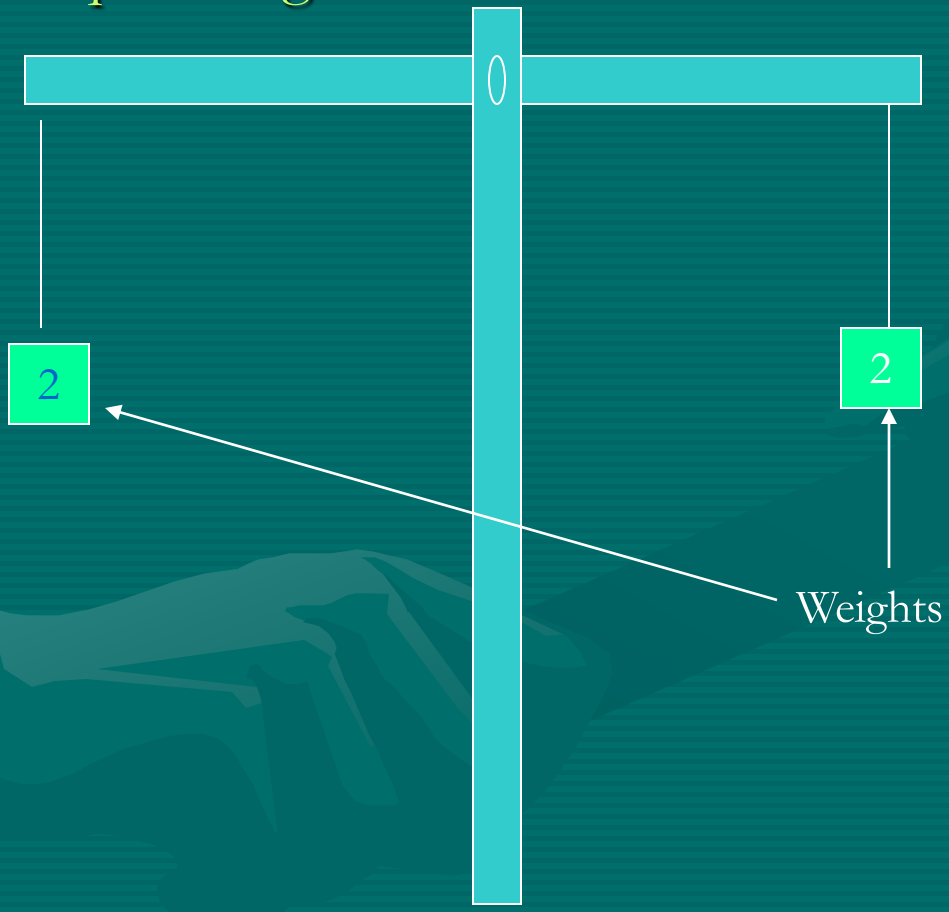
The Basic Concept for Utilizing the Kinetic Energy in Wind and Water

First: Create a System in Balance

With

Equal Weight on Each Side of a Fulcrum



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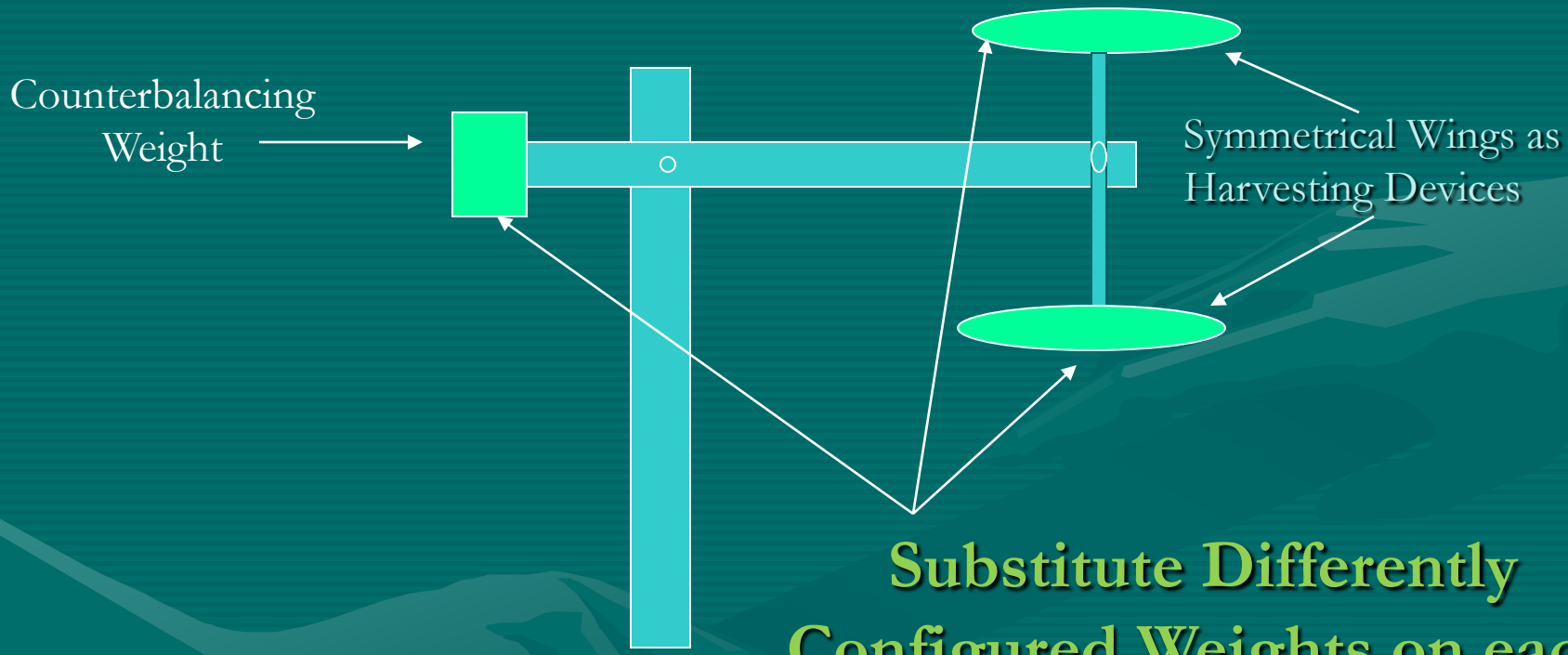
Then:

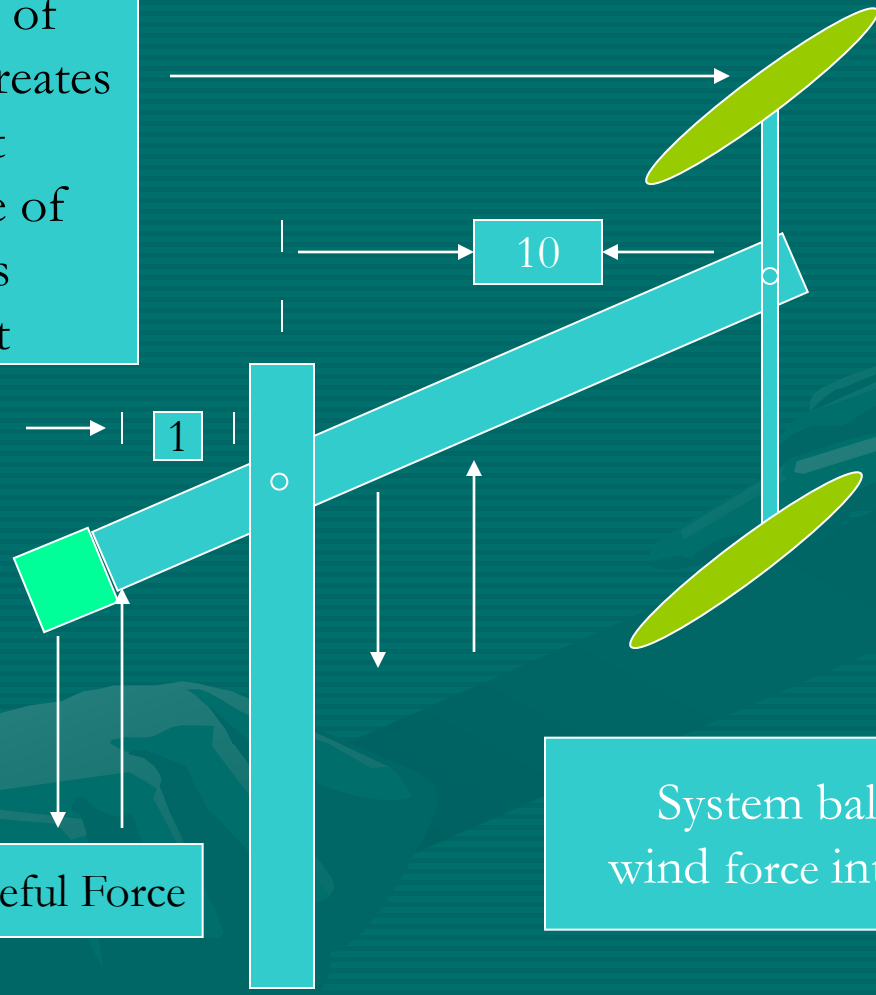
Reconfigure the Balanced Beam with Devices that have a High Potential for Harvesting Wind Energy



Substitute Differently Configured Weights on each side of the fulcrum and the System remains in balance

Thereby a Wind Harvesting Process is Created

A positive Angle of attack on a wing creates a positive lift
A negative angle of attack creates a negative lift



Wind Energy

Mechanical advantage of 10:1

Useful Force

System balance changed by the wind force interacting with the wing

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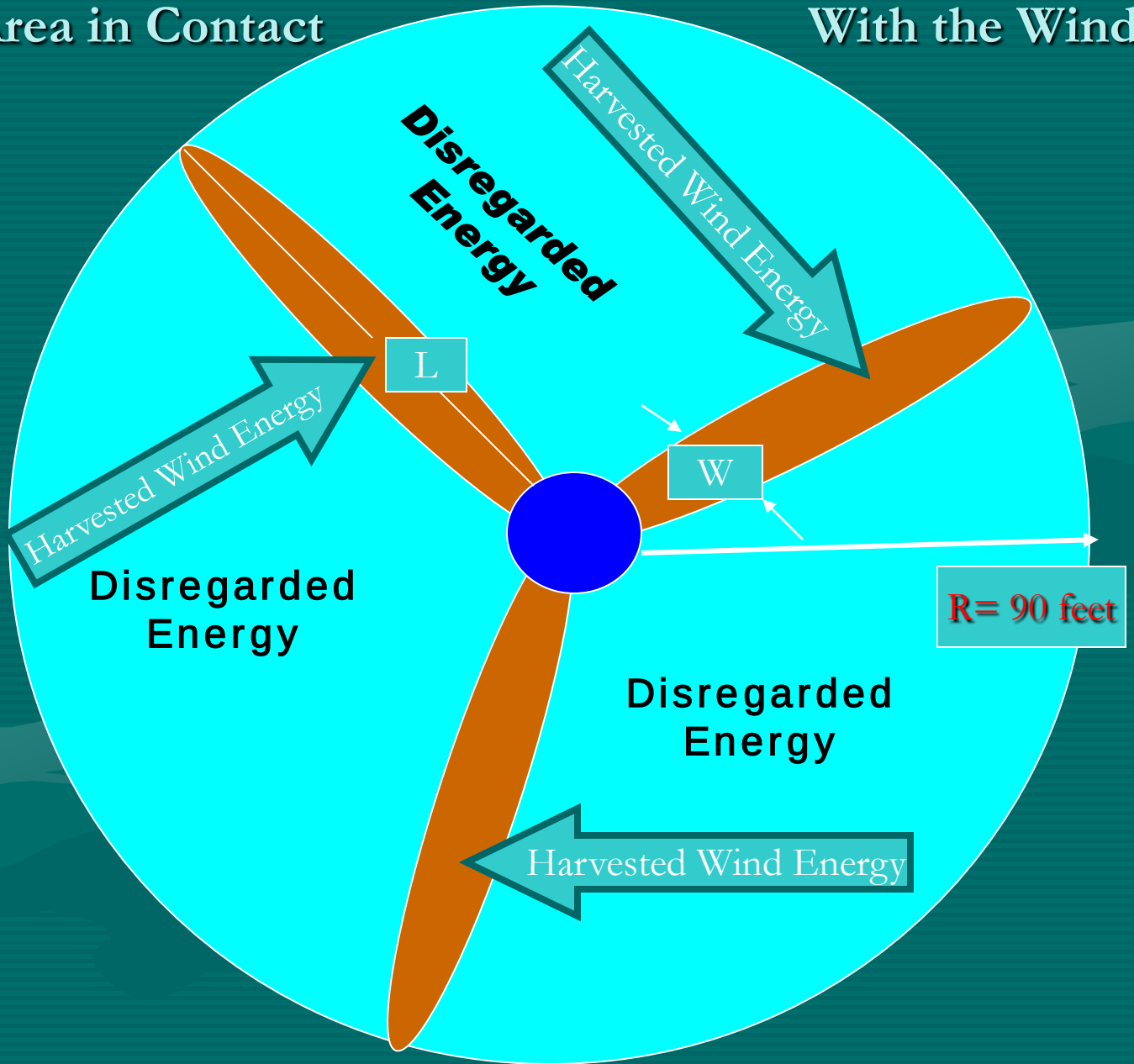
Now Consider The Initial Efficiency of Wind Turbine Blades as the Ratio of the Total Swept Area to the Total Forward Blade Area in Contact With the Wind



Then: Consider the Efficiency of the Propeller Driven Turbine for Harvesting Wind Energy

- When the radius of the propeller rotating in the swept area is 90 feet – the swept area through which it passes is 25,500 sq. ft.

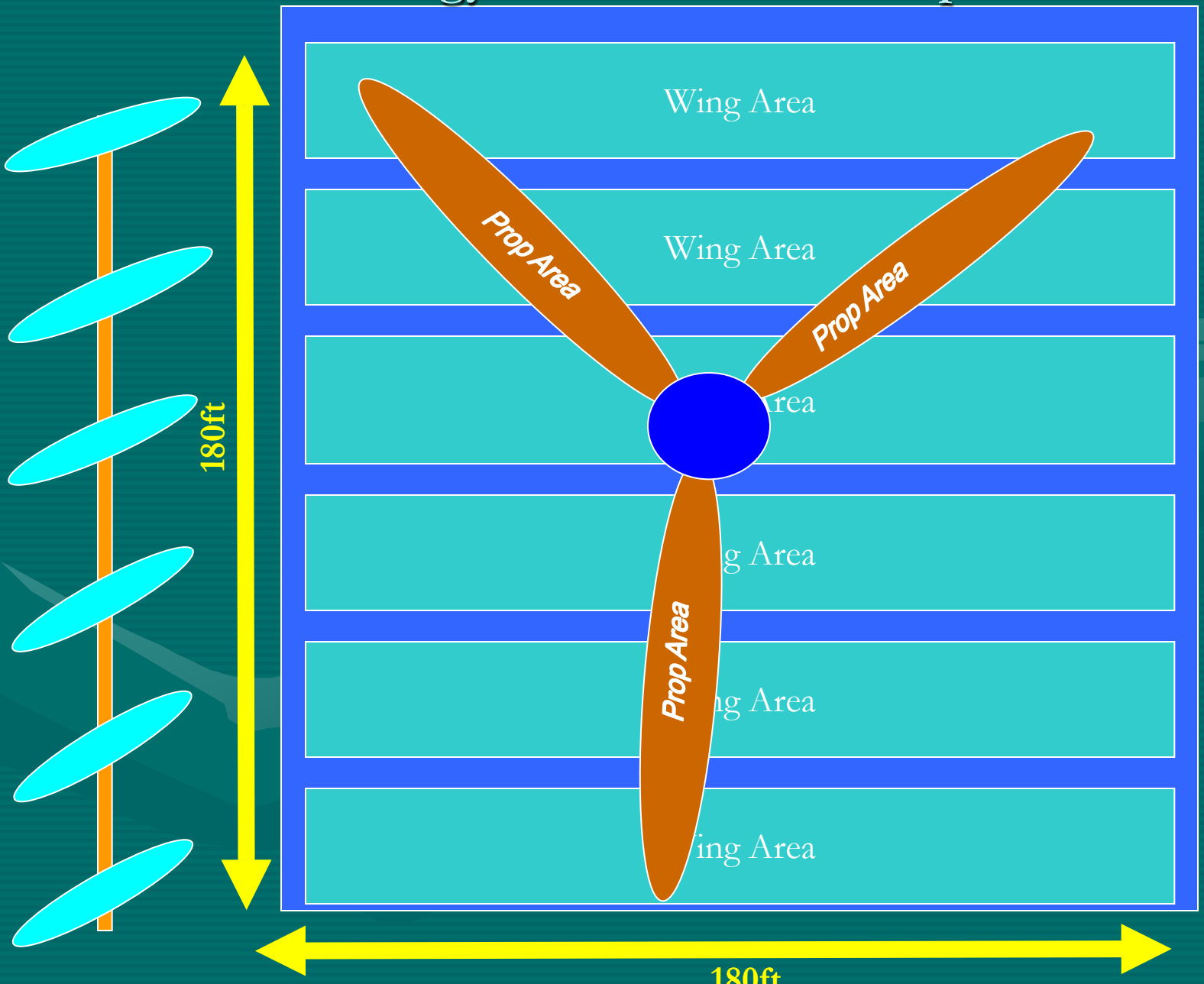
&

- Assuming the dimensions of each of the 3 propeller blades to be 88 ft long x 5 ft wide then there will be a total surface area of 1,320 sq. ft.

Then

The *Initial Efficiency* for harvesting wind energy before conversion losses = 1,320/ 25,500 = 5%

WindWing Area vs. Turbine Blade Area
Energy Extraction Area Comparison



Projected Harvesting Capability Of Equivalent WindWing Size

- If the wings are 180 feet by 20 feet with the angle of attack at 20^{o} degrees, the exposed wing area is ~3,600 $^{sq.\ ft.}$ /wing
  - With six wings the combined area is~ 21,600 $^{sq.\ ft.}$

&

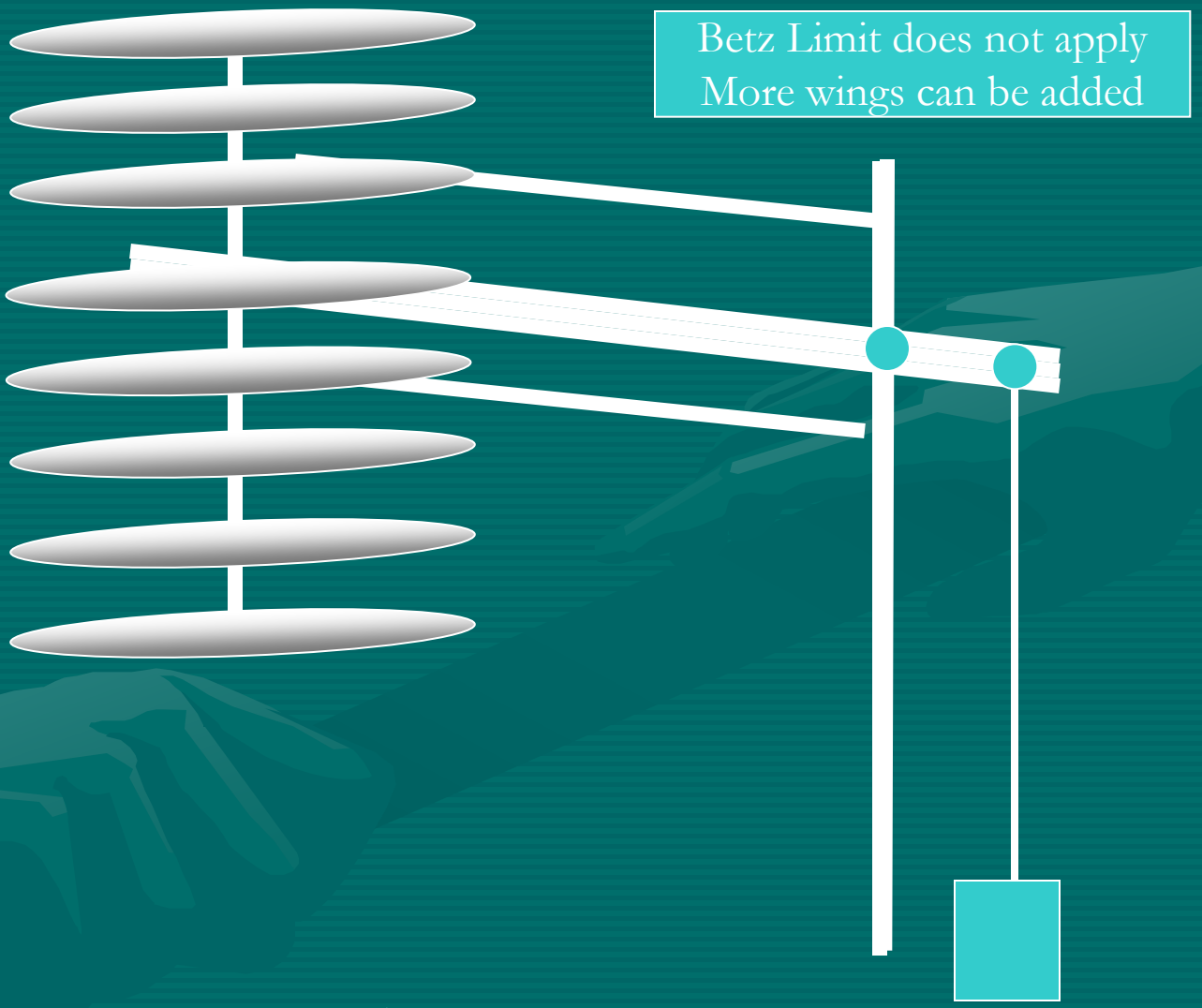
- With a rectangular swept area of (180^{ft} x 180^{ft}) = 32,400$^{sq.ft.}$

Then

The potential for harvesting wind energy before conversion losses = ~21,600/ 32,400 =~65%

Multiple WindWing System

Patented



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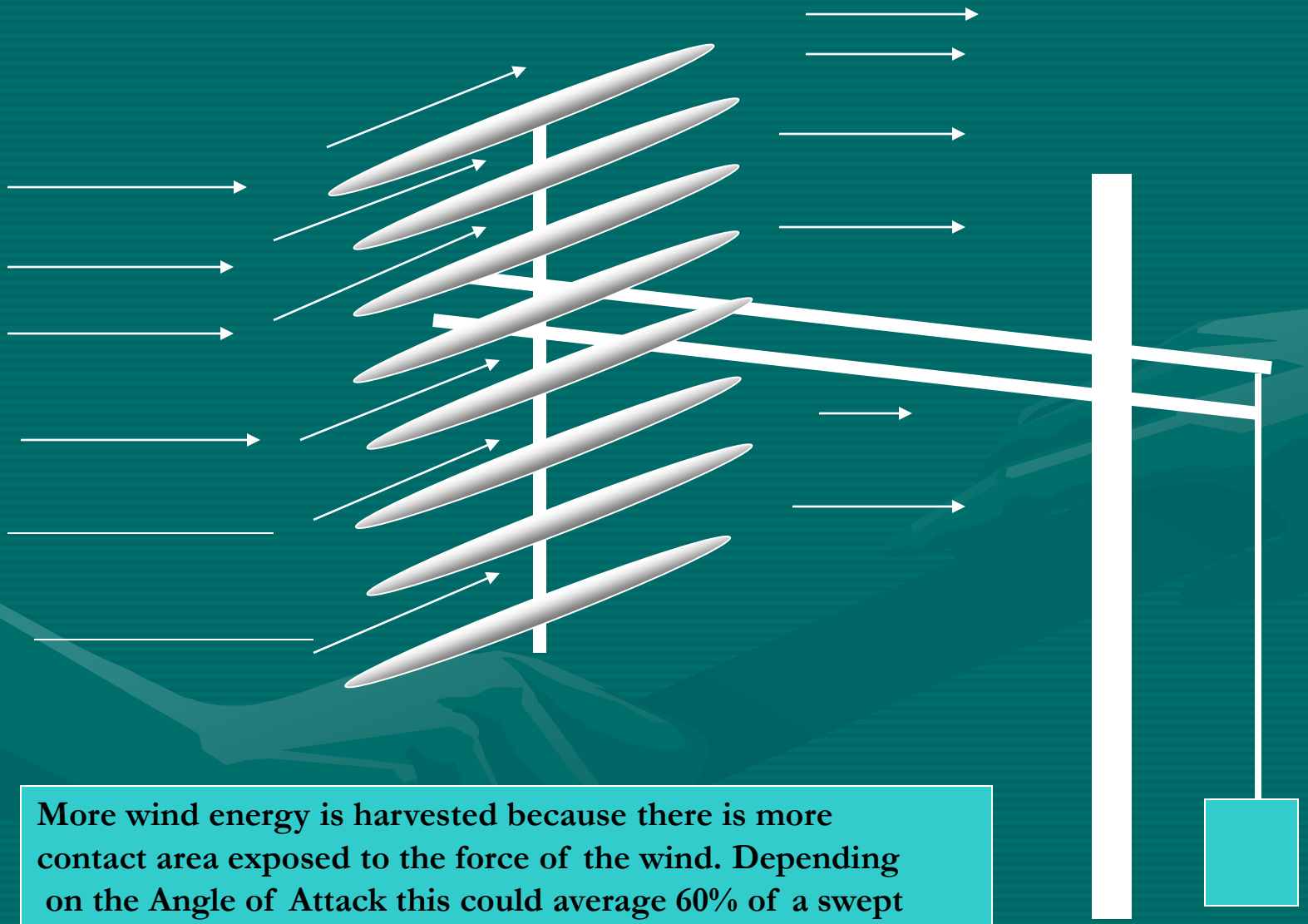
Increased Area of Contact



More wind energy is harvested because there is more contact area exposed to the force of the wind. Depending on the Angle of Attack this could average 60% of a swept area as opposed to 5% or less for the propeller driven turbines

New WindWing Installation

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WindWing Retrofit in Wind Farm

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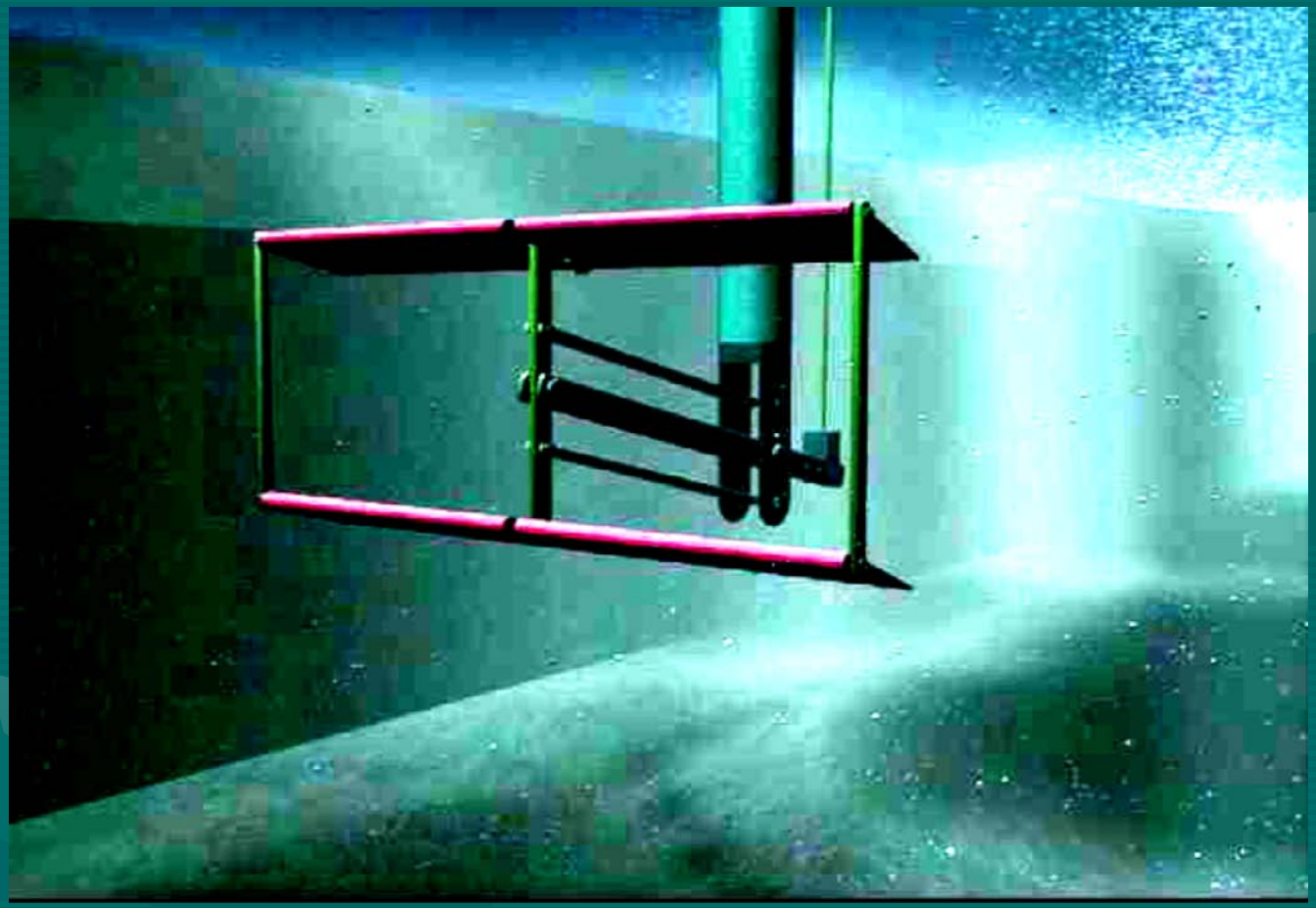
The Technology Applied to Flowing Water

- In the more dense environment, such as a river or an aqueduct, the wing can be submerged and the force of flowing water is captured in the same manner as the WindWing harvests wind energy.

- The following slides present the concept:

WaterWing

A New Technology for Harvesting Water Energy



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Comparison of Lift on an Airfoil in Air and Water !

Joukowski Airfoil in Standard Earth Atmosphere

Airspeed = 3 mph, Altitude = 5 ft, Surface Area = 7.75 sq ft,
Pressure = 14.694lb/sq in, Temperature = 58F, ***Density = 0.00237slug/cu ft***
Angle of attack = 15.0 degrees, Camber = 0.0 % chord, Thickness = 12.5 % chord,

Lift = 0.44 lbs Wings Only

Lift = **4.4 lbs** With Mechanical Advantage

Joukowski Airfoil in Water

Water velocity = 3 mph, Depth = 5 ft, Surface Area = 7.75 sq ft,
Pressure = 16.863lb/sq in, Temperature = 60F, ***Density = 1.94slug/cu ft***
Angle of attack = 15.0 degrees, Camber = 0.0 % chord, Thickness = 12.5 % chord,

Lift = 359 lbs Wings Only

Lift = **3,590 lbs** With Mechanical Advantage

Conceptual Aqueduct Installation

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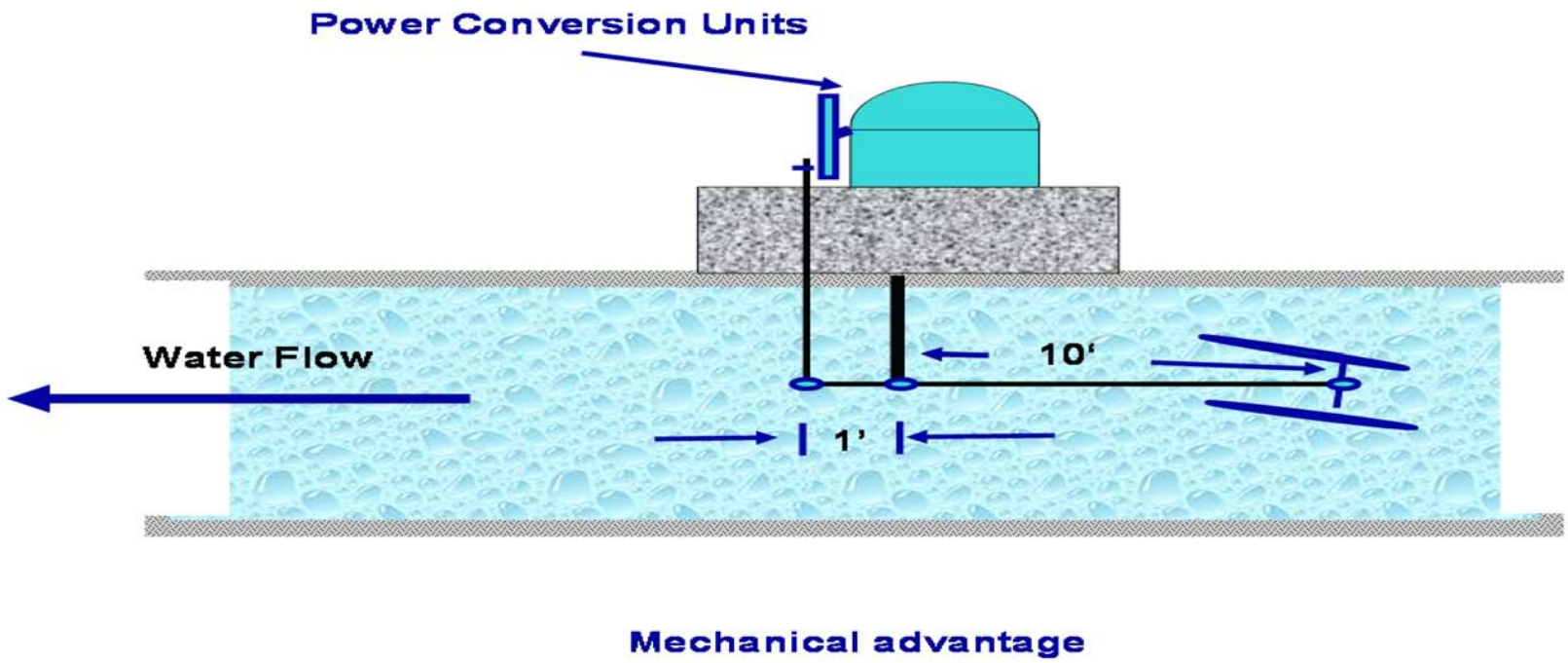
WaterWing in a River Diversion



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For Instance


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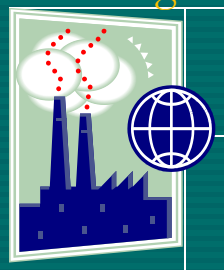
Something Else to Consider:
The Grid

Large output production facilities will always be needed to produce electricity for transfer to heavy demand points of use.

Distributed production by smaller producers satisfying their own needs by using a variety of means for doing so will provide for a reduction of the stress on the Grid.



Large Scale Generator

Large Scale Generator

Distributed Production Small Generator

VIRTUAL BATTERY

Large Scale Generator

Distributed Production Small Generator

Distributed Production Small Generator

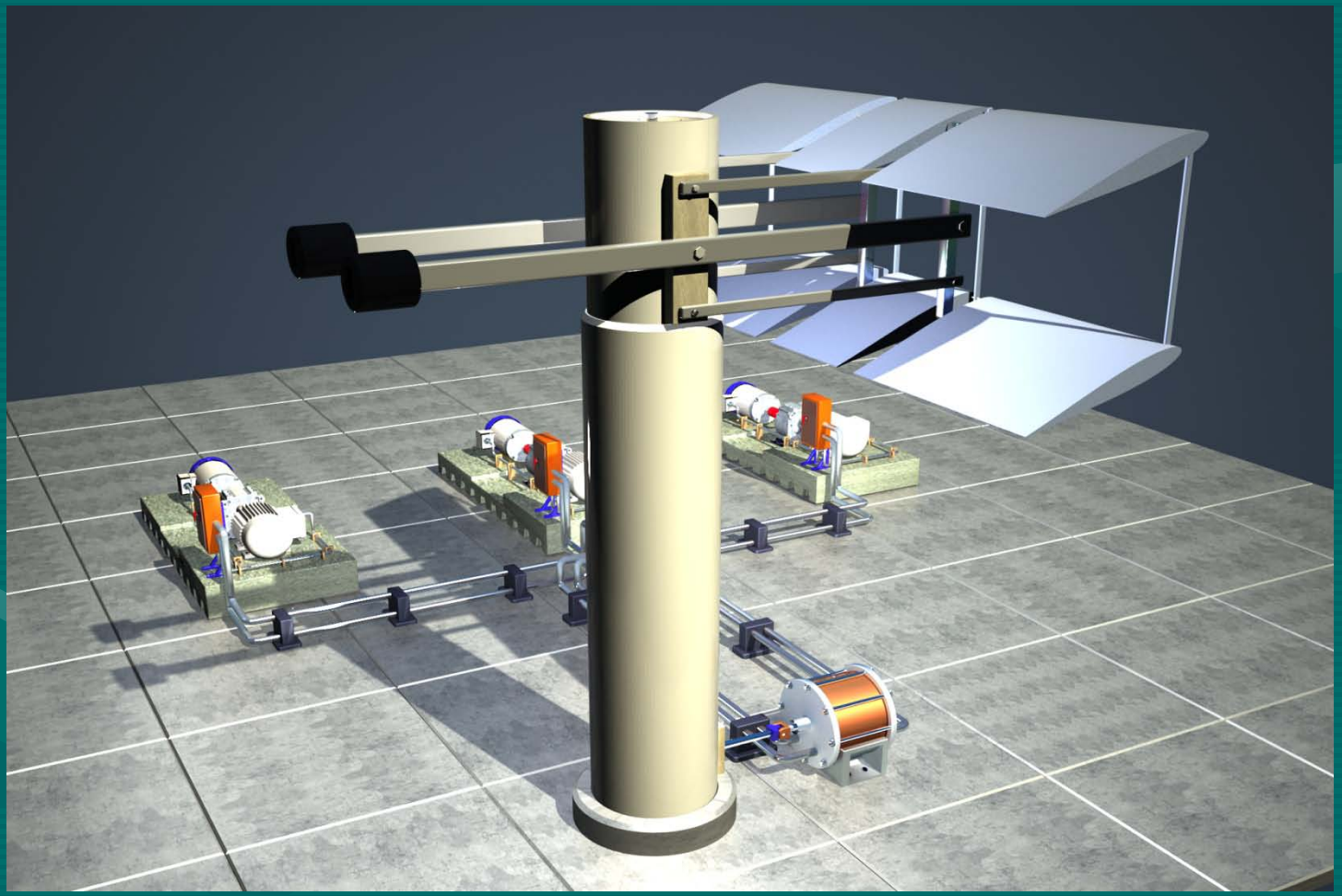
Large Scale Generator

Large Scale Generator

The Continental Grid

WindWing in a MicroGrid System

Proprietary Design for Producing Quality Electricity Off Grid
(Equally Suited for Water Applications)



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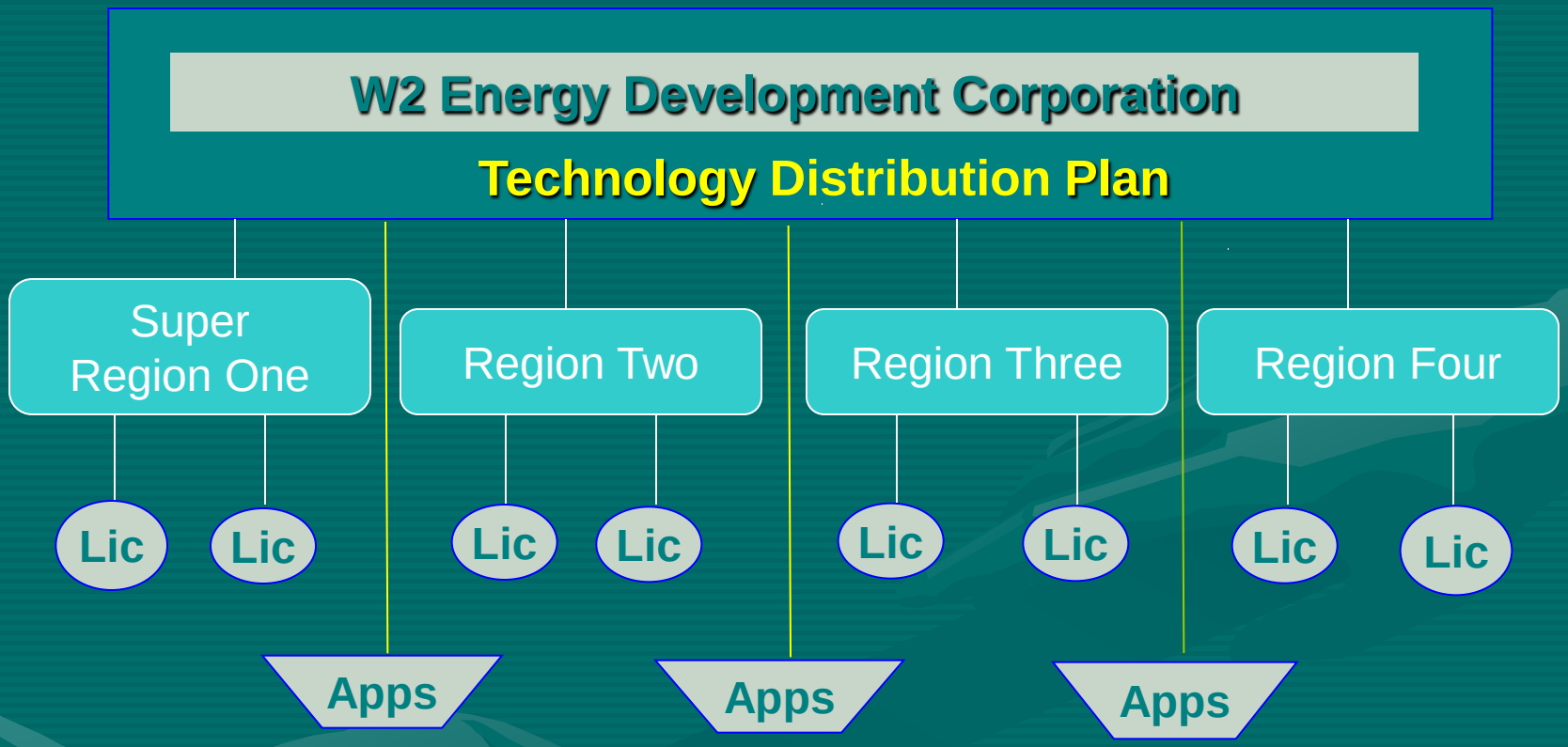
Next Steps

- Capitalization of Projects
- Inaugurating Test and Evaluation Programs for a variety of applications off grid.
- Program for integrating WindWing technology into new and currently operating systems.
- Developing a Macro and Micro-Cluster technology

Putting it All to Work



Wind Harvesting Technology

Elegant Simplicity in Design

Thank You For Your Interest

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WindWing

a new technology for harvesting water energy

Comparative Considerations Between The WindWing Technology and Wind Turbines

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Applications Considerations

Technical Issues	Propeller Turbines	WindWing
Betz Limit	Yes	No
Maintenance	High	Low
Solar Options	No	Yes
Generator Placement	Nacelle on Pole	On Ground Level
Safety Issues	Significant	Low
Scalable Efficiency	No	Yes
Site Adjustability	No	Number of Wing Stacks
Force Multiplier	Low	Mechanical Advantage
Off Grid Placement	Limited & Expensive	Yes, Micro & Macro Cluster Designs

Environmental Impact

Environmental Issues	Propeller Turbines	WindWing
Avian Destruction	Yes	Unlikely to occur
Noise Pollution	Yes	Negligible
Footprint & Profile	Large & High	Smaller & Lower
Placement	Wind Farms	Distributed Points of Applications
Aesthetically Appealing	No	Yes

Investment, Availability and Integration Considerations

Financial Issues	Propeller Turbines	WindWing
Efficiency Gains	3-5%	40-60%
Manufacture	Remote/ Specialized	Local/Low Cost
Ship, Install Costs	Specialized/High	Routine/Local Labor
Effective Start Speed	16 MPH	6-8 MPH
Delivery Time	2-3 years	4-8 months
Retrofit Capability	No	Yes
Multi Stacking	No	Yes

WindWing Attributes

- Higher quality power output
- Improved consistency of power
- Scalable for application adaptability
- Benign environmental impact
- Standardized industrial components
- Low Manufacturing Costs

Micro-and Macro-cluster Benefits

- Distributed generation reduces Grid demand
- Matches application & use requirements
- Grid capacity limits not affected
- Decentralization allows for increased energy production at more locations closer to users
- Provides emergency back up power for the grid
- Provides for remote electricity requirements not economically available from the grid

Future Benefits

- Available work force is expected to diminish by 30% in next 10 to 15 years – However, WindWing technology will grow local work force demand
- Because of simplicity and efficiency in design, fewer highly skilled personnel will be required
- Personnel requirements will be for fewer technicians decentralized in smaller work groups