Approved by Executive Director: Craig Nakamoto
July 3, 2024

FOR ACTION

I. REQUEST

Consider Authorizing the Executive Director to Enter into a Three-Year Right-of-Entry Agreement with Kanoa Winds Inc., a Delaware Corporation, for a Portion of Lot C, Located in the Makai Area of the Kakaako Community Development District [No Postal Address], and Further Described by Tax Map Key No.: (1) 2-1-015: 052, for the Purpose of Allowing Kanoa Winds Inc. to Store and Operate One Wind Turbine for Research and Demonstration Purposes, Subject to Other Right-of-Entry Terms and Conditions, including, but not limited to, rent, maintenance, insurance, indemnity, removal, and responsibility for obtaining necessary governmental approvals and reviews.

II. BACKGROUND

Kanoa Winds, Inc. ("Kanoa Winds") proposes to temporarily install a vertical coaxial contra-rotating twin blade (VCCT) wind turbine in Kaka'ako. This proposed research and demonstration project will provide data to evaluate the local generation potential of this renewable energy source as well as assess any potential environmental impacts.

VCCTs utilize vertical, bi-directional blades that generate rotational torque via both lift (pull) and drag (push) forces. The VCCT technology has been used in Japan for over 15 years. The turbines are also touted to be quiet (less than 40 decibels) and have been proven in Japan to be safe for birds and bats. VCCTs can also be paired with small photovoltaic panels or placed into arrays that further improve their generating efficiency.

From a resiliency standpoint, one of the key distinguishing features of VCCTs is that they generate power at a much wider range of wind speeds than traditional horizontal-axis wind turbines, such as those installed in Kahuku on the North Shore of Oahu. VCCTs can operate at wind speeds between about 3 and 60 meters per second (about 7 to 134 miles per hour). In contrast, traditional horizontal-axis wind turbines typically stop generating at wind speeds of about 20 meters per second (about 44 miles per hour).

III. DISCUSSION

Kanoa Winds is proposing to install a 0.5-kilowatt turbine in the HCDA-owned parking lot adjacent to the Hawaii Technology Development Corporation (HTDC) Entrepeneuers Sandbox. The proposed power unit is 23-feet in height and has a footprint of about 24 square feet. The unit will likely be placed on a 40-foot shipping container and would take up the space of several parking stalls. The unit could also be bolted into existing foundations or footings.

As part of the proposed Right-of-Entry, Kanoa Winds will be required to maintain liabilty insurance and be responsible for all safety, security, maintenance of the equipment, and removal of the equipment. The Executive Director will also request that Kanoa Winds to compensate HCDA, in some manner, for any lost revenue from the loss of parking stalls, so that there will be virtually no net cost to the agency. Kanoa Winds will also be responsible for obtaining and paying for the cost of all required permits, and governmental reviews.

Thr benefits of the proposed test project is the ability to gauge public reactions to the technology and gather in-service data on the power output, safety, and visual impacts of the units.

IV. RECOMMENDATION

Authorize the Executive Director to Enter into a Three-Year Right-of-Entry Agreement with Kanoa Winds Inc., a Delaware Corporation, for a Portion of Lot C, Located in the Makai Area of the Kakaako Community Development District [No Postal Address], and Further Described by Tax Map Key No.: (1) 2-1-015: 052, for the Purpose of Allowing Kanoa Winds Inc. to Store and Operate One Wind Turbine for Research and Demonstration Purposes, Subject to Other Right-of-Entry Terms and Conditions, including, but not limited to, rent, maintenance, insurance, indemnity, removal, and responsibility for obtaining necessary governmental approvals and reviews.

V. REFERENCES

https://kanoawinds.com/

Attachments:

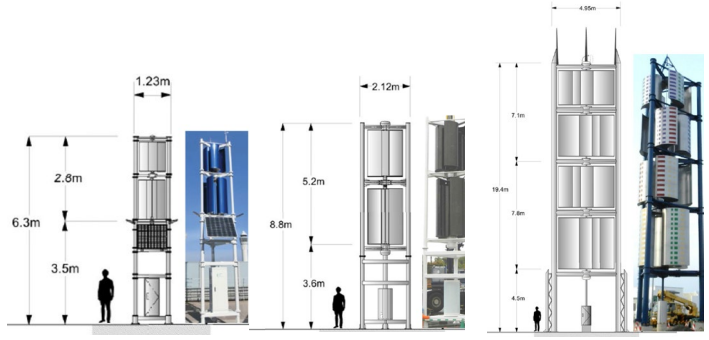
Exhibit A: Information Sheet
Exhibit B: Proposal
Exhibit C: Presentation

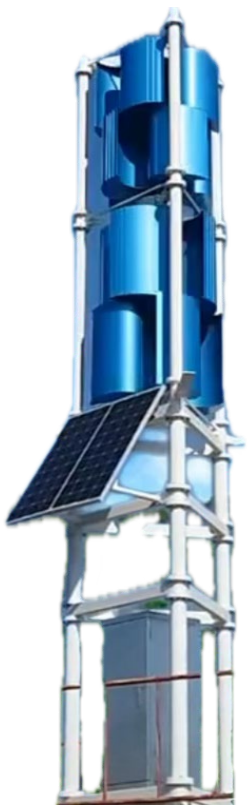
Prepared By: Ryan Tam, Director of Planning and Development _____

Reviewed By: Craig Nakamoto, Executive Director Craig Nakamoto

Kanoa Winds, Inc.

Advanced Wind Power Solutions &
A Scalable Platform for Green Energy





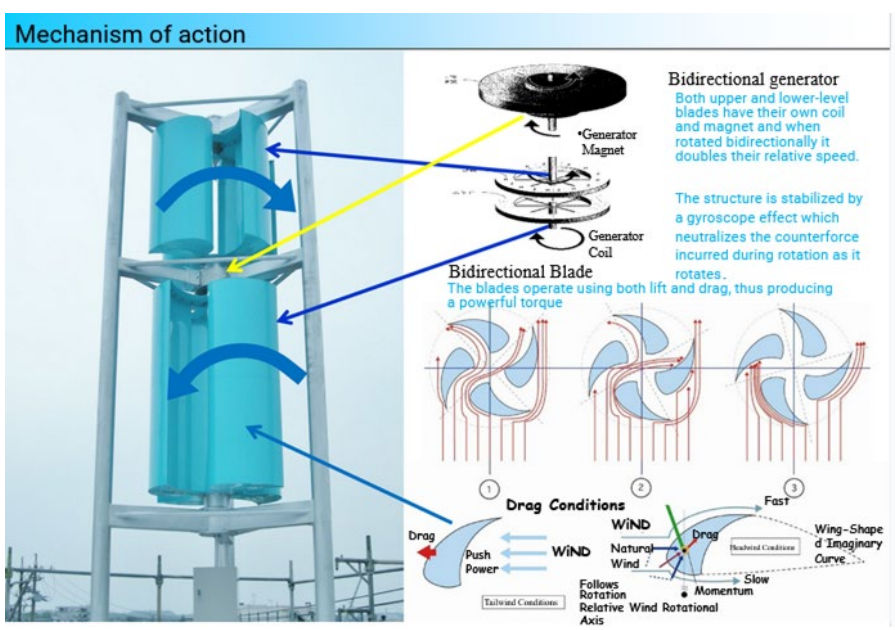
VCCT TECHNOLOGY

VERTICAL COAXIAL CONTRA-ROTATING TWIN BLADES

- USA patented, scalable VCCT wind power generation system.
- Supports power generation from a wide range of wind velocities. VCCT resolved the low-frequency noise issue (<40dB), shadow flickering and damage due to bird/bat strikes, which are inherent problems found in conventional propeller wind generators currently deployed and disputed throughout Hawaii.
- Kanoa Winds offers a hybrid wind & solar power generation and storage system providing an advanced power platform to meet broad needs across industrial, civil and residential applications.
- A semi-knock down manufacturing facility will be built in Hawaii with adjustable capability to meet local demand and support export to Kanoa Winds expansion to the continental USA.

Kanoa Winds will…

- Create local green career opportunities
- Incorporate a China free supply chain
- Economical logistics based on SDG's
- Provide Notable tech coming from Hawaii
- Contribute to the creation of a sustainable society (RE100) against climate change.



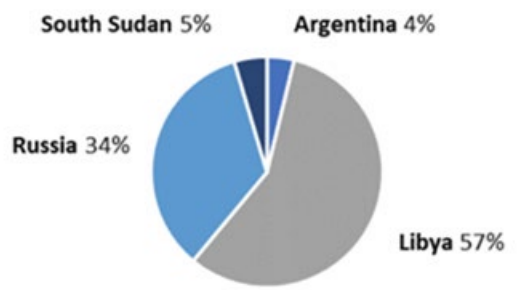
Key Features

- Proven Success at Nagoya Airport, Japan
- Beautiful Design & Quiet Operation
- Environmentally Friendly
- Efficient Footprint & Multi-directional Wind Capture Capability
- Complete Standalone System
- Easy Maintenance
- Durable against Lightning Strikes & Strong Winds of 70+ mph
- Proven Scalability .3 kW – 20 kW
- Local Assembly and Logistics

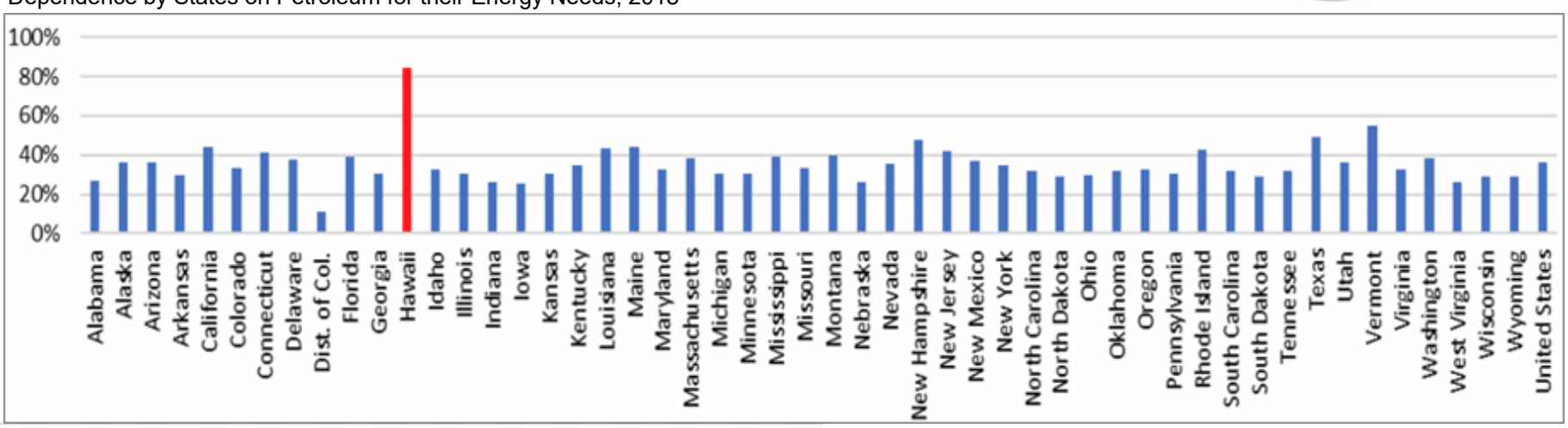
Why Hawaii

- High Energy Dependence on Petroleum
- Target of 100% Renewable Energy by 2045
- Excellent Wind Conditions
- Creation of a new Industry, local production, job opportunities
- High Quality Functional Supply Chain - Hawaii & Japan
- Optimal conditions for hybrid Wind and Solar Power generation platform systems
- Location offers on/offshore energy applications
- Underserviced Geography
- Focus on sustainability

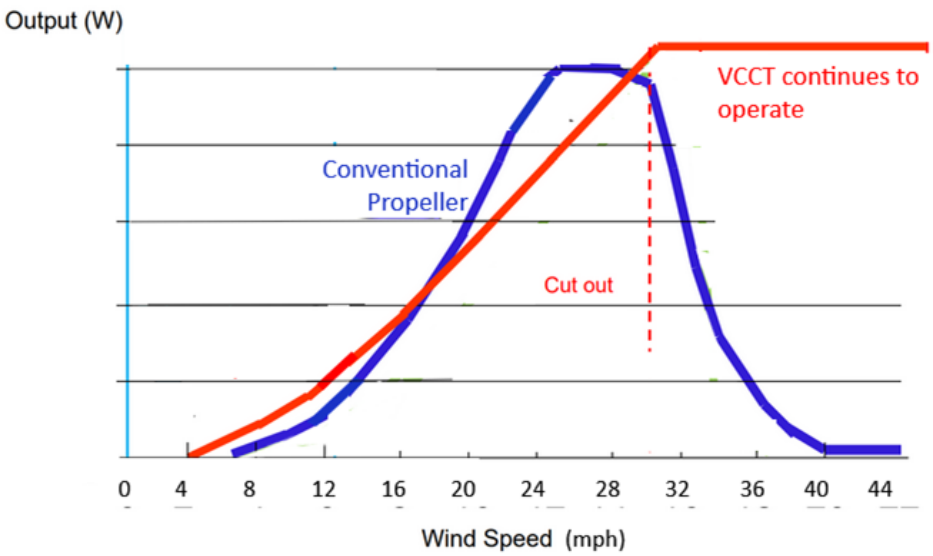
Crude Imports to Hawaii by Country of Origin, 2019



Dependence by States on Petroleum for their Energy Needs, 2018



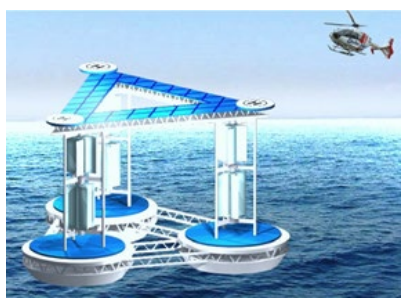
Power generation profile comparison between Conventional Propeller and VCCT



Imagine the Future Possibilities …

Bridgestone HQ, Japan

Nagoya Airport, Japan



June 21, 2024

HCDA Research Partnership and Data Collection

for Safe Wind Power in urban Honolulu

Introduction

The following document is intended to support the ongoing development of urban Honolulu and the opportunity to harness safe wind-power with tested and proven technology, exclusively imported from Japan by Kanoa Winds, Inc.. In cooperation with the Honolulu Community Development Association (HCDA), Kanoa Winds, Inc., proposes to temporarily install a small wind turbine for testing purposes in the parking lot adjacent to the High Technology Development Center (HTDC). The proposed parking lot is under HCDA responsibility and the opportunity to test and support this important technology in Hawaii proposes an exciting opportunity for the new adoption of additional renewable energy sources among the urban Honolulu challenges.

STUDY OBJECTIVES

The opportunity to safely and quietly harness wind power in close proximity to transportation, buildings and daily activity represents a high-valued and highly needed addition to Hawaii's renewable energy landscape. In order to support the State's 2045 sustainable energy goals, the need to advance the study of power collection in the high density urban landscape through a wind energy solution is extremely important and exciting. Due to the ubiquitous nature of this technology's utilization throughout Japan's urban district and the thorough testing done there, we believe this technology could advance Hawaii's use of independent power systems to operate lighting, signage, pumping stations, bus stops and other urban uses in and around the Honolulu metropolitan area.

USE CASE STUDY

To conduct the Use Case study we anticipate a 2 year testing period to take place with a temporary use permit of a single .5kW system, to be erected in the HCDA parking lot, adjacent to the HTDC Sandbox

Building. As identified by the above statement and attached material, the use case scenarios for this technology have been thoroughly tested and deployed throughout Japan. The safety first approach of this technology offers a dynamic look at efficient power generation in a multitude of urban and rural applications such as independent power systems to operate park lighting, street signage, pumping stations, bus stops and other City and County systems, as an example. Throughout the period of temporary use, the unit will allow a team to conduct an urban Wildlife Impact study on the erected unit, as well as re-evaluating known data provided by the corporate partner. The Study will allow proper review and evaluation from community, corporate, County and State stakeholders to see the unit in operation allowing it to be evaluated in a public setting.

TESTING PROCEDURE OVERVIEW

The proposed unit installation in the parking lot area of the Kewalo basin industrial site poses an ideal test scenario to evaluate both safety and effectiveness in Honolulu's urban district with minimal to no site and/or community impact. Throughout the pre-install and post installation there will be numerous tests which will be conducted. The testing to be conducted will be to advance the research and development of this technology and its viable uses within the State of Hawaii. Equipment and technology tests will include the following:

- Wildlife Study
- Environmental Assessment
- Wind Speed power generation
- Equipment Load Tests
- Stability Tests
- Safety Evaluation Study

INSTALLATION PROCEDURE OVERVIEW

PRE-INSTALLATION: To begin the testing scenario the unit first must go through an on site evaluation, equipment checking and pre-installation test. The test unit will be delivered to the site either in its current storage setting of a 40’ shipping container or on a flatbed. The test unit is currently mounted to a rolling caster steel cradle. To conduct the initial evaluation the unit will be either removed from the

container or taken off of the flatbed and placed on the asphalt at the site location with a fork lift. While mounted to the cradle, the unit will undergo an initial equipment review and evaluation to make sure the unit and all its components are in a ready to operate condition. This evaluation will include functionality review of the rotating mechanisms, fastener checking, testing the wiring panel and reviewing the onboard battery location for adequate support. This general evaluation will also occur once the unit is erected in place during installation.

INSTALLATION: When the initial testing is completed and the unit is ready for installation, the following installation procedures will be performed. The unit will be removed from its cradle by forklift or crane and set on top of a steel plate in its erect position. The unit will then be attached to the steel plate using carriage bolts and remain as is on the asphalt in its designated location. Note that the test unit on a steel plate would not be mounted to the asphalt in this use and will not disrupt the asphalt or soil beneath.

PARTNER COMPANY INFORMATION

Kanoa Winds is in the business of designing, developing, and marketing distributed generation wind power systems for the small wind (1kW-100kW) market. Our initial plan is to introduce our technology to the state of Hawaii. Our wind power systems are focused on distributed energy, where a specific machine's energy output is largely or entirely used on-site where the equipment is installed, as well as grid connected applications.

TECHNOLOGY

The Vertical Coaxial Contra-rotating Twin blades (VCCT) wind turbine is a Japanese designed technology with the primary attention to safety. The technology was created with the intention to generate safe and clean wind power under a wide variety of environments. The VCCT technology has been in operation for more than 15 years in Japan with unique placement in close proximity to both transportation, utilities and residential communities. The function of the design uses swept area as its mechanism to generate power, vs. the standard lift-based mechanism of the traditional wind turbines,

as seen in Kahuku and other parts of Hawaii. The VCCT design has perfected the efficiency and scalability of Savonius wind, which is known for safety and reliability.

Because of the safety and reliability of the design, Japan‘s prestigious Royal Hawk Society has been an endorser of the technology as it poses a positive opportunity for renewable energy's positive impact on the environment. Additionally, the VCCT unit has been known to have birds nesting within the device, proving the safety and coexistence between the birds and the VCCT technology

ENVIRONMENTAL STATEMENT

The .3 kW Unit and .5 kW Unit

The .3 and .5 kW Kanoa Winds units are designed for functionality and usefulness in applications such as charging stations, street lighting, and system support. The .3 kW unit stands at roughly 21‘ tall with an approximate 24 sqft footprint and the .5 kW at roughly 29‘ tall with the same 24 sqft footprint offering a relatively low height and narrow operating footprint. The compact operating footprint design is significantly different from the propeller wind turbine technology currently on the market and effectively contributes to the safety and environmental benefits of the design. The low unit heights are well below surrounding buildings, street lights and telephone poles, which allows the unit to operate with minimal impact on migrational patterns or flocks of birds, all which are known to fly above the tree line height of 30 - 40‘. In Honolulu, migrational birds and bird flocks tend to fly above the building height which can vary from different locations around the island. In the selected Kakaako site, the same is true of the birds in this urban and industrial area.

Site Selection - Kakaako, HCDA Parking Lot

The site location selected to temporarily demonstrate the .5 kW unit would put the unit in the middle of a mostly underserved parking lot adjacent to the Entrepreneur Sandbox and the Hawaii Technology Development Corporation (HTDC), which offers a unique connection and opportunity for convenient analysis of this new technology. Both Site 1 and Site 2 were selected for both their seclusion and proximity clearance from surrounding buildings or regularly used parking spaces.

Site Specific Wildlife Review

The particular site has two primary types of wildlife which may interact with the device; birds and insects. Onsite primary species to be aware of are as follows:

	Day Time	**Night Time**
Birds	Rock Pigeon, Spotted Dove, Zebra Dove, Java Sparrow, Myna and House Sparrow	
Insects	Flys, cockroach, mosquitoes and termites	cockroach, mosquitoes and termites

Based on the function of the device, utilizing savonius wind capture, the device offers little to no threat to both birds and insects. During the day the bird and insects are mostly non-present as the parking lot sits between several buildings which has already impacted the flight pattern of onshore birds, so within the period of data collection on the site, no birds flew into the area of where Site 1 or Site 2 were. This brings us to the common understanding that both categories of wildlife which would be most likely

impacted by the installation of the Kanoa Winds unit, would be nominal and otherwise non quantifiable.

Based on this understanding, the immediate objective for the temporary installation of the unit would be to conduct several data collection tests and impact data for both determining the actual energy production of the device in operations and its actual impact to the surrounding wildlife.

Coexistence between wildlife and wind power

Measures to promote wind power without threatening bird habitats means utilizing the latest VCCT technology and adopting more reliable and safe technologies, as proposed by this document.

Coexistence is possible if humans make concessions, taking into consideration the adaptability of the target species. Specifically, it is important to consider the size, shape, installation location, number, and construction period of wind turbines based on surveys of the habitat status of birds of prey in the relevant area. It is also crucial to develop or select power generation devices that have less impact on the environment and wild bird habitats, rather than prioritizing installation costs and power generation efficiency, although VCCT technology is a viable solution to Hawaii's green renewable energy goals.

The Japan Falconiformes Center

The Japan Falconiformes Center (JFC) was established in 1982 to promote various conservation projects for Japanese birds of prey, utilizing falconry techniques and facilities developed by falconers during the Edo period (1603-1868). This organization is an expansion of The Hawking Club of Japan, founded in 1964 to preserve traditional Japanese falconry and conserve birds of prey. Since 1973, JFC has been a member of the International Association for Falconry & Conservation of Birds of Prey (IAF) and joined The International Union for Conservation of Nature (IUCN) in 2022.

In Japan, several birds of prey are classified as endangered due to the impact of human activities on their habitats. We believe that we must use our knowledge and resources to improve the situation of wildlife affected by environmental disruption caused by humans.

Currently, endangered species in Japan are protected under government regulations, and various conservation activities are in place to improve their status. One of these activities includes rescue efforts for injured birds of prey, which JFC conducts using falconry skills at the request of related agencies. Habitat preservation is also crucial for conserving endangered species. The perspective of falconers is valuable in maintaining suitable hunting areas and nest sites for wild birds of prey and understanding

their behavior. JFC promotes coexistence projects to conserve endangered species in various development areas.

Business Introduction

Kanoa Winds, Inc.

Kanoa Winds, Inc.

Kanoa Winds represents cutting-edge technology, scalable and efficient, harnesses wind power to generate clean energy, even in extreme conditions.

Kanoa Winds is focused on delivering power generation and storage system solutions providing an advanced power platform to meet broad needs across industrial, civil and residential applications. Solving the high efficiency problem with vertical wind power, the Vertical Coaxial Contra-rotating Twin blades (VCCT) technology is able to generate commercial power below $0.10 and has been in commercial operation for more than 15 years throughout Japan, and has been fully tested in extreme wind and arctic conditions.

We are dedicated to providing affordable power solutions for the urban and rural communities seeking for reliable and safe power.

VCCT, Japanese Scalable Wind Power

Kanoa Winds is dedicated to launching in Hawaii with its Vertical Coaxial Contra-rotating Twin blades (VCCT) wind turbine. A semi-knock down manufacturing facility will be in Hawaii with adjustable capability to meet local demand and support export to Kanoa Winds expansion to the continental USA.

This cutting-edge technology is highly scalable and efficient, operating at low wind speeds and designed to produce in extreme conditions.

Why Hawaii?

From the very beginning, we have identified Hawaii as the ideal location to introduce our revolutionary technology and initiate our manufacturing operations.

Utilizing our technology with a high quality functional supply chain to support Hawaii's high energy dependence on Petroleum, abundant wind resources, strong governmental support for clean energy initiatives.

A vibrant, engaged business and local community focused on sustainability and renewable energy solutions.

Why Hawaii?

30km/h=8.3m/s=18.6mph
20km/h=5.6m/s=12.5mph

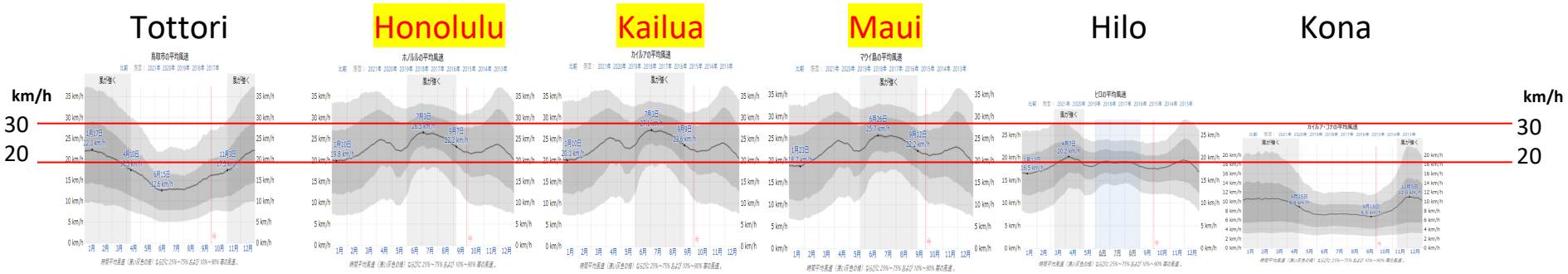


Figure 4 - Dependence of States on Petroleum for their Energy Needs, 2018

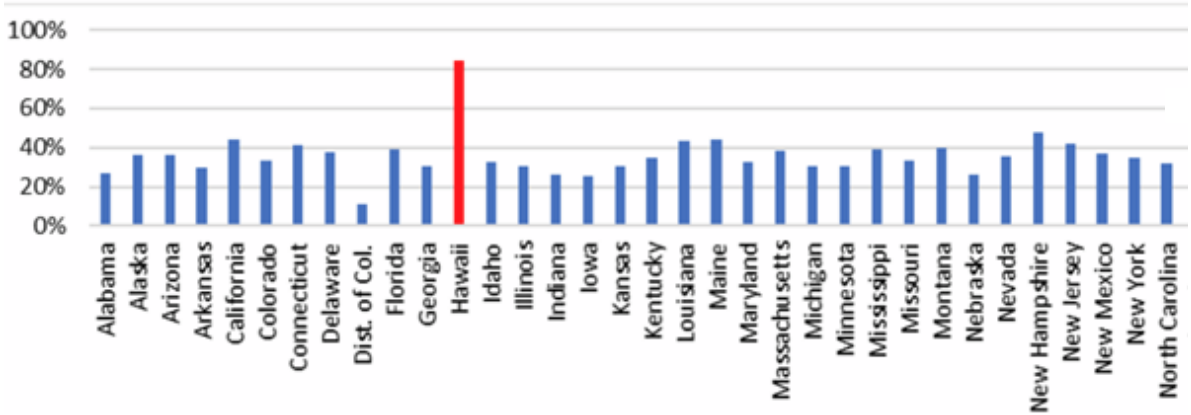
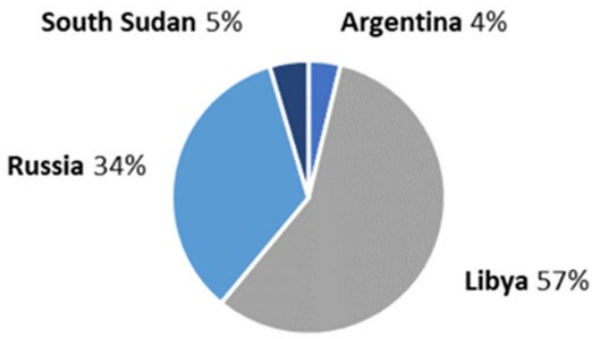


Figure 6 - Percentage of Crude Imports to Hawai'i, by Country of Origin, 2019



The VCCT Solution



Renewable and Sustainable
Wind power is a limitless, renewable resource that will never run out, making it a reliable and sustainable energy solution.

Environmentally Friendly
Wind turbines produce no greenhouse gas emissions or other pollutants, making them a clean and eco-friendly energy source.

Cost-Effective
Take advantage of 30% Federal tax credits on the cost of your next system. In addition, the space efficiency to generate power on such a small footprint makes VCCT a cost- effective energy option.

The VCCT Solution

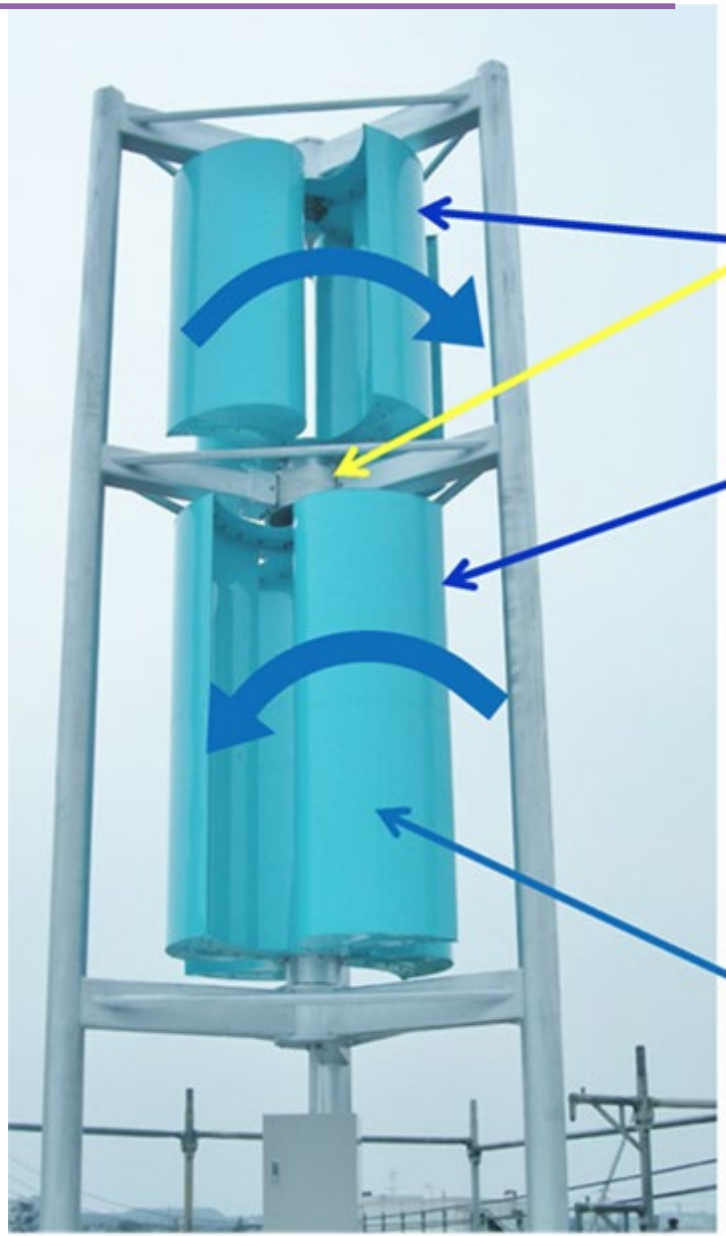


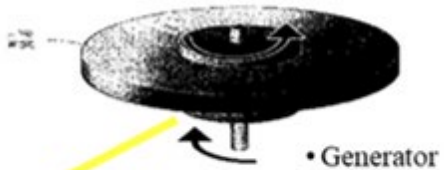
Advanced Design
Designed to operate at > 40db, creates minimal vibration and is capable of generating power from a wide range of wind velocities, even in typhoon and arctic conditions.

Environmentally Friendly
Small footprint, quiet operation, is proven to be bird and bat safe, avoids flickering shadows, and is made to be fully recyclable.

Versatile Application
Public and Private Utility, Offgrid, Single unit, microsite or wind farm adequate and available for semi-knockdown manufacturing.

How VCCT Works





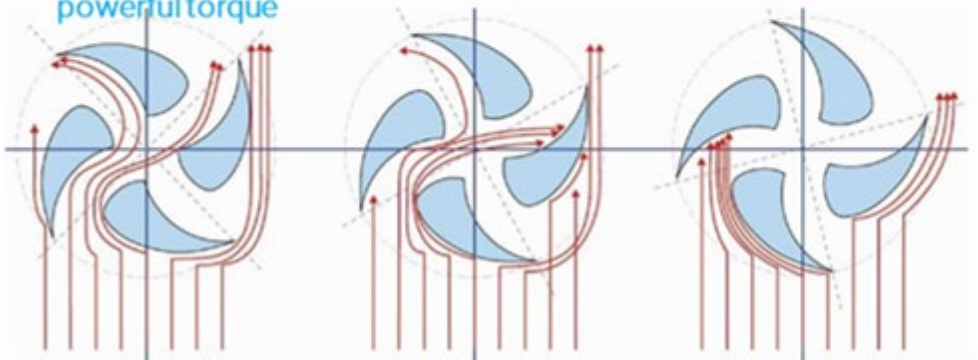
Bidirectional generator

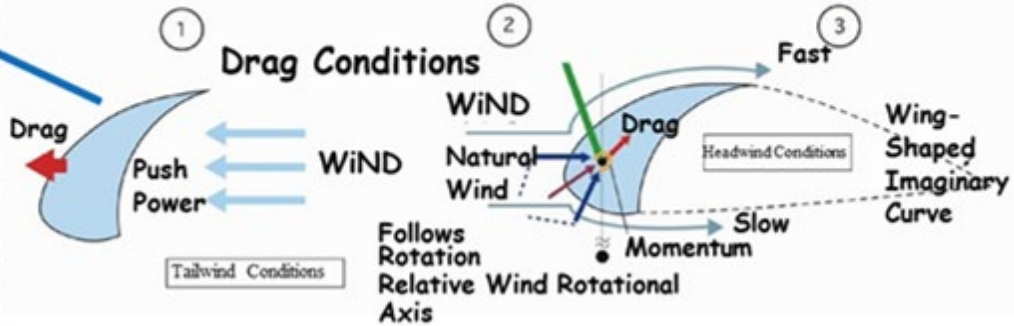
Both upper and lower-level blades have their own coil and magnet and when rotated bidirectionally it doubles their relative speed.

The structure is stabilized by a gyroscope effect which neutralizes the counterforce incurred during rotation as it rotates.

Bidirectional Blade

The blades operate using both lift and drag, thus producing a powerful torque





Operating Range Against Wind Speed

HAWT

	TC-0001	TC-0002	TC-0003	TC-0004	TC-0006	TC-0007
型式名称	Airdolphin GTO	Z-9000	DS3000	Windspot3.5KW	EXCEL10	RW3K-JA-01
登録者／製造者	ゼファー	ゼファー／Britwind	Hi-VAWT	ジャパンライフ／SONKYO	Bergey	リアムウィンド
基準出力[kW]	0.59	4.7	1.8/1.9	3.2	8.9	1.6
基準年間発電量[kWh]	786	9,167	2,669/2,514	4,818	13,842	1,478
メーカー国	日本	英国	台湾	スペイン	米国	日本

	TC-0008	TC-0010	TC-0011	TC-0012	TC-0014	TC-0015
型式名称	442SR	GW133	Windera S	H3000	GHRE19.8J	TN 535
登録者／製造者	Xzeres	Gaia-wind	Ennera	TECO	WinPower/GHRE	TOZZI
基準出力[kW]	10.4/9.5	10.7	3.1	2.8	19.7	10.2
基準年間発電量[kWh]	16,899/14,853	27,502	6,179	4,608	65,400	37,410
メーカー国	米国	英国	スペイン	台湾	中国	イタリア

	TC-0016	TC-0017	TC-0018	TC-0019	TC-0021
型式名称	LC9800	CF20JAPAN	HY16/19.7	Osiris10	ANE AH-10kW
登録者／製造者	ライフコミュニケーション／GHRE	C&F	HY エネルギー／GHRE	Ningbo Ginlong Technologies	エヌ・ピー・アイ／Shaddey Anhui New Energy Equipment
基準出力[kW]	9.6	19.3	19.7	8.3	9.8
基準年間発電量[kWh]	19,882	46,924	65,500	22,429	21,186
メーカー国	中国	アイルランド	中国	中国	中国

VAWT

VCCT

Wind speed (m/s)

0 10 20 30 40 50 60 70

Cut in

Cut out

Extreme

3 16~20 ~60

No cut out

Power generation possible during typhoon conditions

Advantage of VCCT WP

Exp .

Start up

Cut in

Extreme

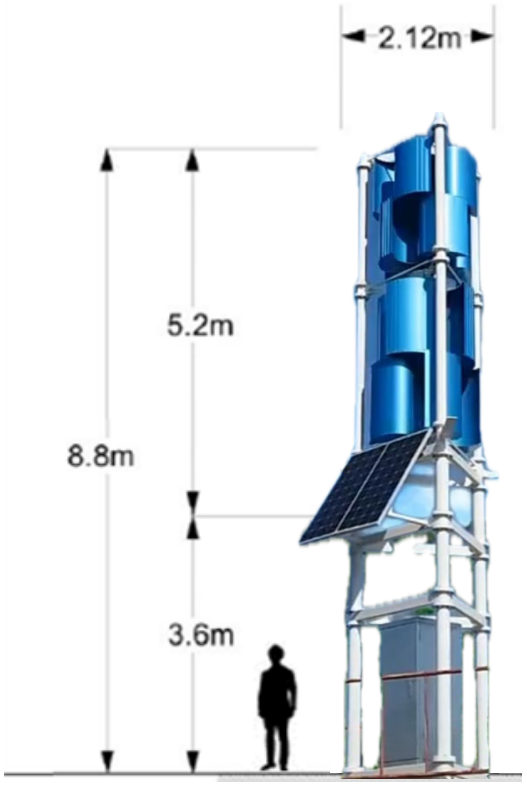
0.5 3 34 60 ---

Wind speed (m/s)

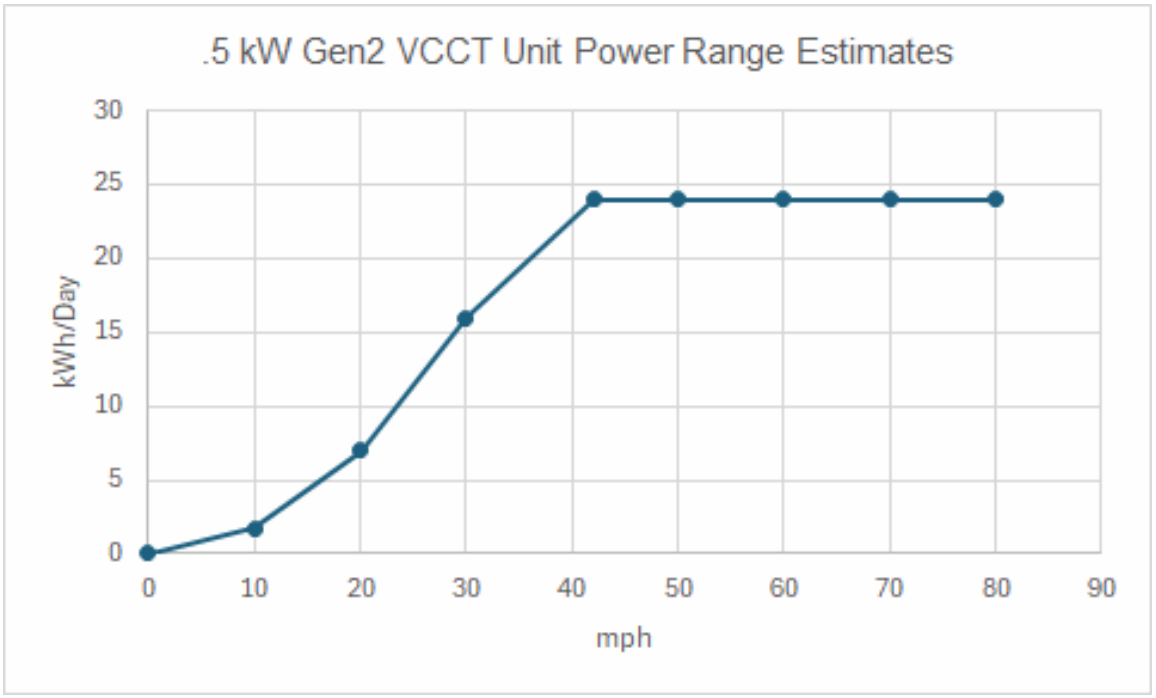
0 10 20 30 40 50 60 70

22.4mph 44.8mph 89.6mph 134.4mph

.5 kW Gen2 VCCT Unit

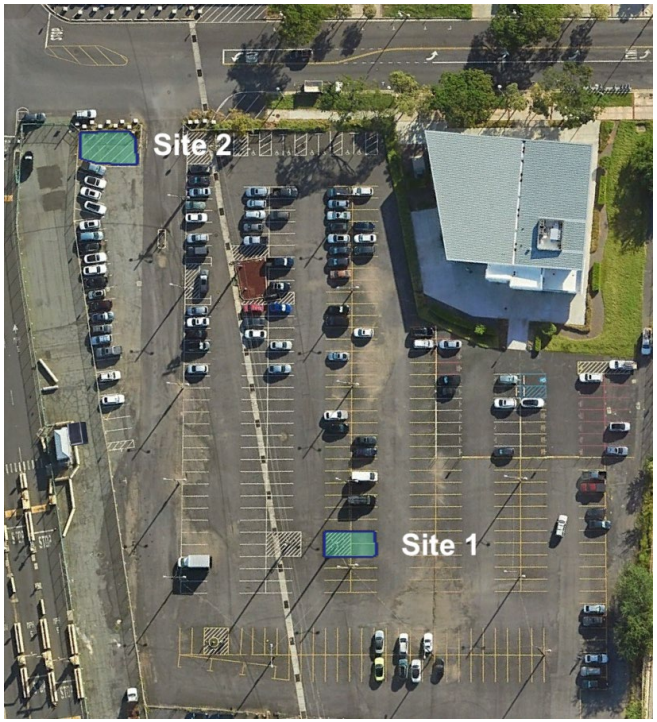


Multi-Functional New Blade Technology



Proposed Site Details

2 Possible Locations



Recommendation: Site 1 Location

(Site 1 Location Rendering)

Site Installation & Storage

- Proposed to utilize a single parking stall to erect and operate the 0.5 kW unit for testing
- The device will be mounted on a 2,205 lb, ¾” steel plate, taking no more than 1 parking stall.
- Possible additional storage requirements which would also not exceed 1 parking stall.

Project Study Objectives

- Hawai‘i Proof of Concept
- Engage with Stakeholders
- Safely and quietly harness wind power in dense urban areas.
- Use case study to power and operate street lighting, security camera systems, signage and general charging
- Environment and wildlife impact study.
- Operation with close proximity to the commercial activity, logistics and transportation services.

Studies to be Conducted

- Wildlife Study
- Environmental Assessment
- Wind Speed power generation
- Equipment Load Tests
- Stability Tests
- Safety Evaluation Study

Small-Scale VCCT Wind Installation Examples

LIXIL

NEXCO

Aichi Prefecture

Mid-Scale VCCT Wind Installation Examples

Kanoa Winds, Inc.

For more information
please contact us today

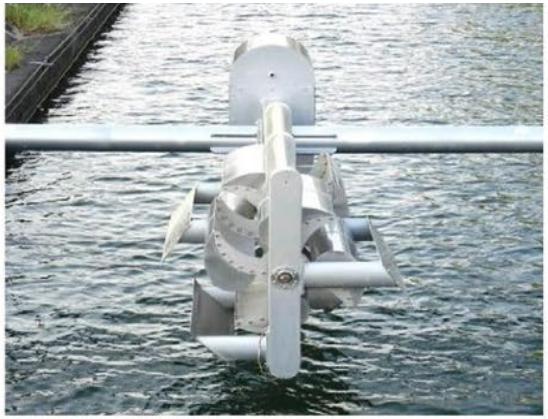
www.kanoawinds.com
cundiff@kanoawinds.com

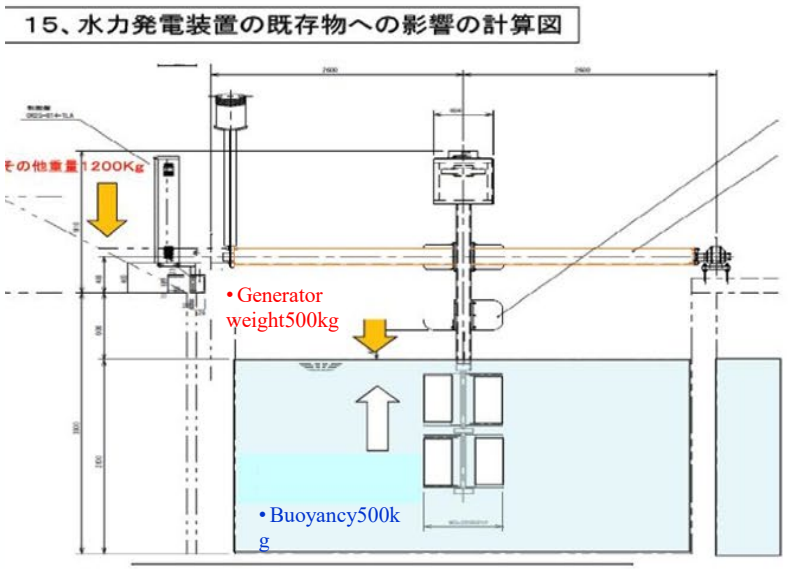
Additional Use Case Scenario

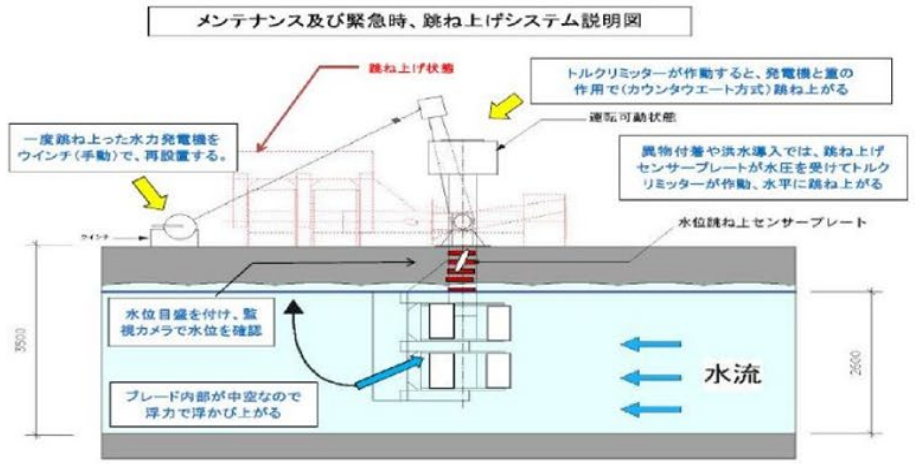
VCCT Application on Roadway

• Kanazawa, Tokumitsu Parking Area

VCCT Application in Water



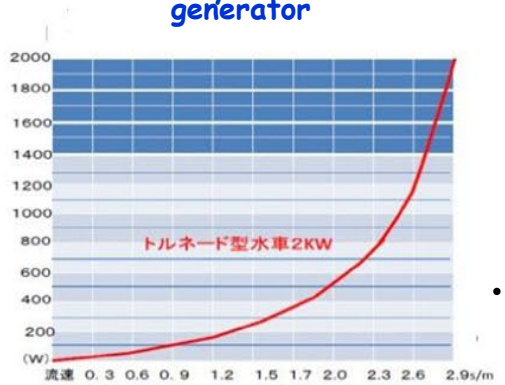




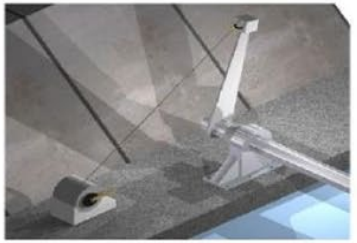
Benefits of this system include:

- Neutral buoyancy
- Escape function
- Easy Installation
- Easy Maintenance

Micro-hydroelectric generator



Torque Limiter Structure



•Water Agency Aichi Irrigation water demonstration