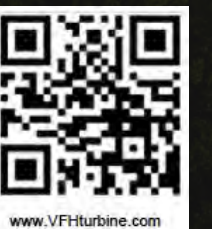




**GREEN POWER
TECHNOLOGIES**

PUERTO RICO

www.VFHturbine.com



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VFH Turbine™ Overview

SMART TECHNOLOGY



ADVANCEMENTS IN DESIGN, EFFICIENCY AND PROGRAMING

VFH Turbine™ is a proprietary small hydro system that stands out as an innovative technology due to its efficiency, scalability, versatility, compact design, environmental considerations, and technological advancements. By addressing key challenges and offering improved performance, it represents a significant advancement in small-scale hydroelectric power generation. The VFH Turbine™ can be designed to incorporate Pelton, Kaplan, or Francis designs within a compact and efficient footprint. The proprietary VFH Turbine™ (Variable Flow Hydro), is considered an innovative technology for several reasons:

- Efficiency and Performance
- Scalability and Versatility
- Compact and Modular Design
- Technological Advancements
- Space Optimization
- Cost-effectiveness
- Increased Power Generation
- Advanced Control and Monitoring
- Sensing, Reporting, Archiving and Management
- Sustainability and Environmental Benefits
- Compatibility for Retrofits and Outdated System Upgrades

MADE IN THE USA

THE SYSTEM

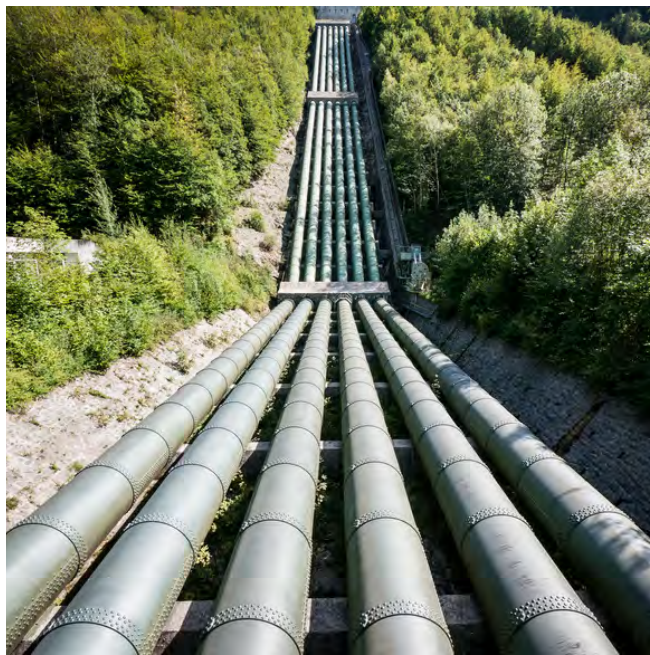
The VFH Turbine™ is managed by industry-grade process control and an automated system. All the parts are monitored every second of every day for normal or abnormal operations, including keeping the operating water pressure at the turbine constant and compensating for varying flow from the penstock. All the pertinent information will be archived and transmitted to secure central data banks frequently.

The VFH Turbine™ is a "stand alone" product, turning water flow into electricity. Additionally, the VFH Turbine™ can be utilized as an "isolated" hydroelectric station furnishing 50/60-cycle AC voltage to a facility independent of a utility grid. Our turbine is constructed of a cast iron casing (not fabricated and welded steel), stainless steel moving parts, quality outdoor construction, a 50-year life expectancy with a one-year unconditional warranty, and ongoing support with a full warranty extension.



APPLICATIONS

VFH TURBINE™



In-line Pipes



**Pump Stations
(Non-pressurized)**



Dam or Reservoir



Run-of-River



**Water Treatment
Plant**

EXISTING DAM OR RESERVOIR

TECHNOLOGY & APPLICATION

The VFH Turbine™ consists of the complete mechanical, electrical, and process control assembly for "smaller" and "medium" flow requirements. Based on the example photo shown, the 42" diameter inlet and 30" diameter inlet can produce up to 650 kW per unit for a Reservoir site. The two existing pipes & flanges coming from the dam will seamlessly match those of our butterfly valve and VFH Turbine™ flanges.

- The Discharge Tube and Runner diameter will be sized according to each unit's head pressure and flow. This design will accommodate a 42" diameter and 30" diameter runner and discharge tube. Thomas Brother's Hydro will supply the tooling for the runner, and the tube will extend from the turbine outlet to inside the river.
- The VFH Control System includes an industrial-grade Programmable Logic Control (PLC) designed to be a "stand-alone" system to control and monitor the operation of the VFH Turbine. It consists of a 6" touch screen for local HMI interface for diagnostic and maintenance functions. The power meter will indicate kilowatt hours, phase voltage, phase current, and power factor. The control system will be able to communicate to a remote monitoring system.
- A Generator is provided and includes a thrust bearing for vertical mount, internal bearing temperature sensors, stator over-temp switch, tropicalized insulation, stator heaters, and epoxy paint.

SILT AND SEDIMENT REMOVAL

The VFH system has been designed to stop the turbine from spinning and allows the flushing process to move more silt and sediment without damaging the turbine or generator. Reservoir flushing removes deposited sediments from the reservoir to retrieve the reservoir storage capacity and help flood control.





EXISTING WATER TREATMENT PLANT

TECHNOLOGY & APPLICATION

The purpose of subject evaluation is to recover the potential energy from a portion of your effluent discharge waters using a hydraulic turbine direct coupled to an induction generator and feed the generated electricity back into the WRF plant, reducing your overall electrical cost. VFH Turbines use Siemens soft and hardware computer components to control the system.

Once installed, maintenance of the generating equipment will not adversely affect your normal WRF operations. The installation of the 36" diameter penstock is large for the present-day effluent discharge flow. Still, we must limit the intake velocity of the turbine and supporting 36" diameter penstock at or below 6 ft./sec. At 6 ft./sec flow velocities, the 36" diameter penstock will support a future flow of up to 40 mgd or 62 cfs.

With clean water and no debris in the effluent discharge, we suggest a more efficient, slower operating speed, Francis-style turbine with wicket gates or a slide drum for regulating the intake of water and resulting KW production, in lieu of the faster-operating speed, and less efficient propeller turbine.

DISSOLVED OXYGEN

Proprietary processes within the VFH Turbine have been designed to dramatically increase DO (dissolved oxygen) into all discharge water flowing through the turbine by up to 350%. This improves water quality and enhances the receiving waters. Aerobic bacteria and aquatic life, such as fish, must have DO to survive.

EXISTING OR FUTURE IN-LINE PIPE

TECHNOLOGY & APPLICATION

The country has innumerable conveyances of water associated with wastewater, stormwater, processed water, canals, pipelines, and rivers. These conveyances, with their lower flows, have historically been bypassed for hydroelectric power production because of the relative inconsistency of flow throughout the day. The current philosophy for generating hydroelectric power requires a large enough water source to maintain a predictable base flow, or that can be managed to provide electricity on command.

The inefficiency arises from avoiding the higher and lower fluctuating flows. Fluctuating flows create havoc with existing turbines and generators, which must either turn at a constant rate per minute or use costly variable speed exciters, speed control devices, and protection systems to generate electricity compatible with the electric grid. Variation from the constant speed will result in the electricity generated being rejected or, worse, the catastrophic failure of the system.

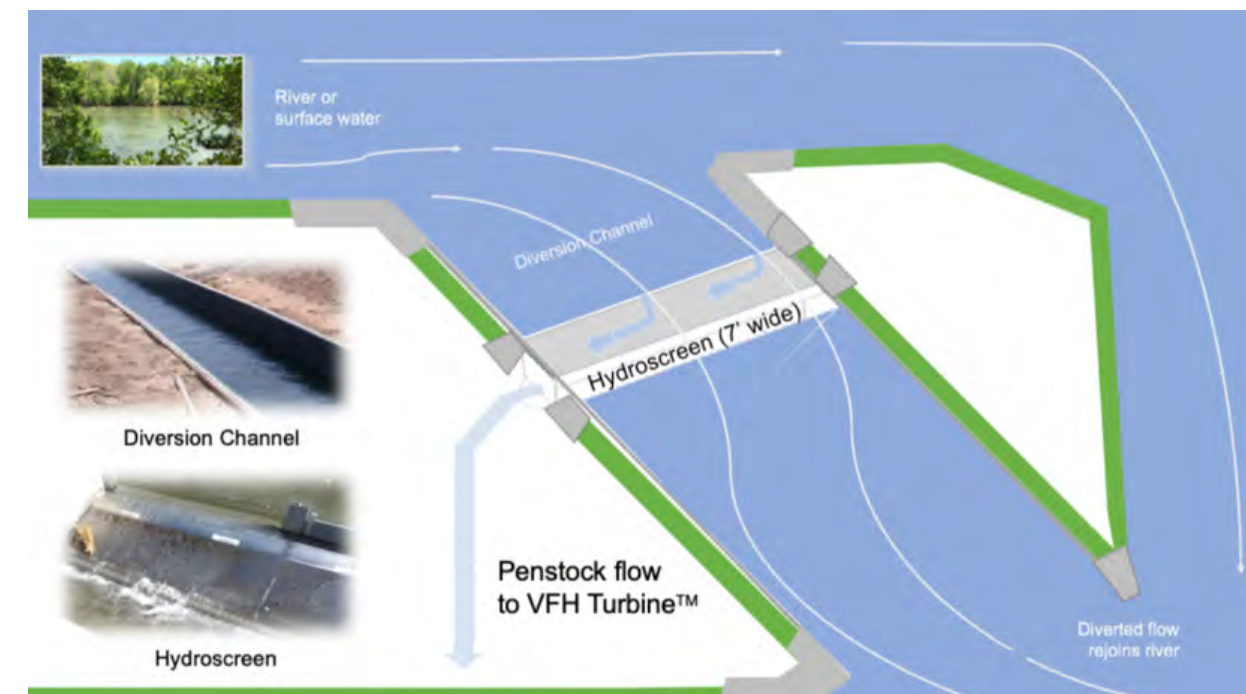
The VFH Turbine incorporates a series of components that have never been put into a similar sequence. The mechanically and hydraulically variable turbine and induction generator (or the constant speed synchronous speed generator) have never been joined in this configuration, permitting the automatic or remote computer control of the entire system. Adding the variable hydrologic splitter allows for more efficient hydroelectric power generation. Finally, the simple computer-controlled flow controller and the flywheel (promoting system inertia) enable the system to regulate the flow of electricity to the power grid system or the independently supplied load. Combining these components into this configuration allows smaller fluctuating water conveyance systems the option and ability to generate electricity.



RUN-OF-RIVER

TECHNOLOGY & APPLICATION

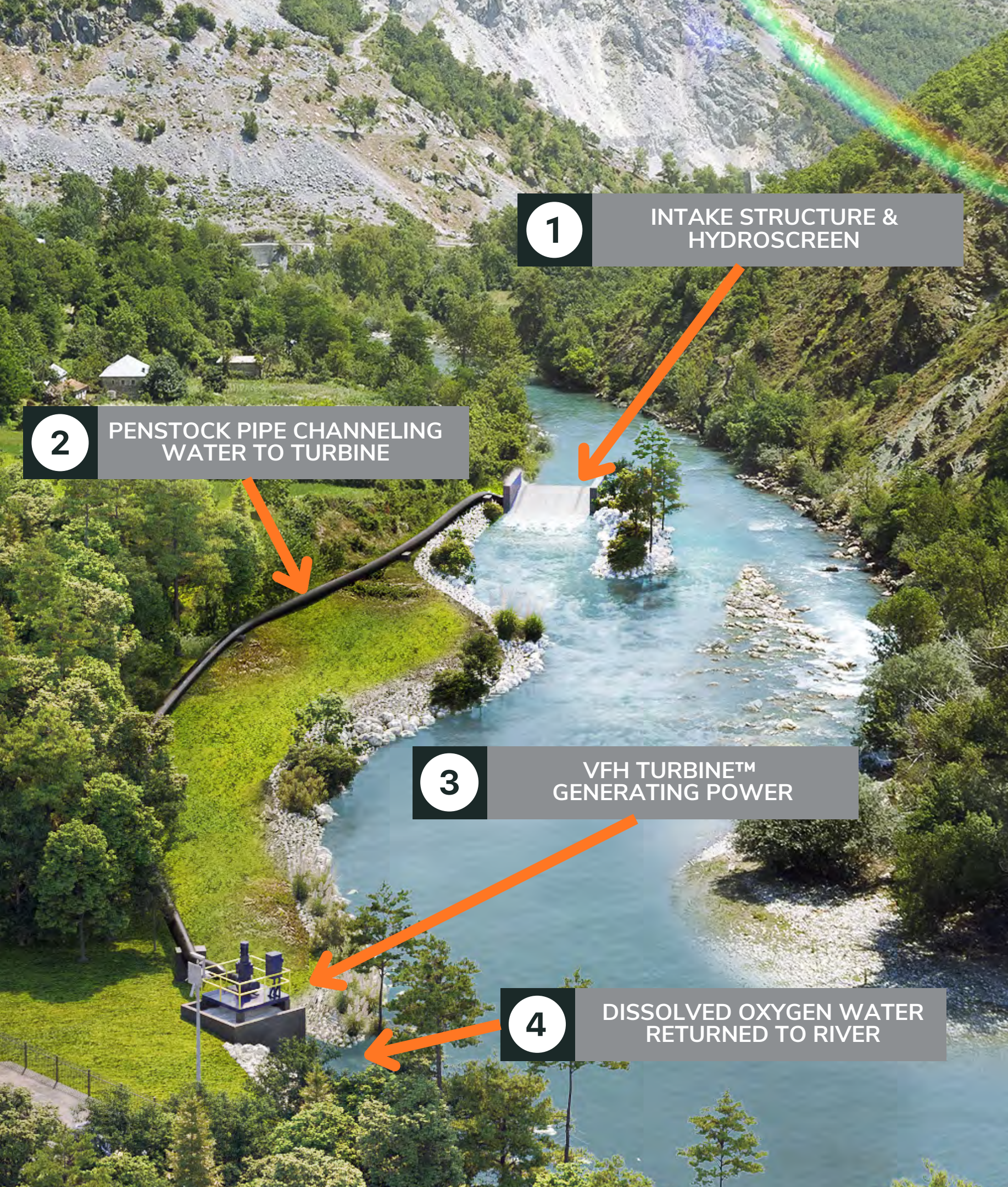
The VFH Turbine™ riverside application can produce energy by utilizing rivers' water flow and elevation, allowing the creation of green renewable energy from inconsistent water flows. By creating an intake structure, we divert a portion of the river stream into a pipe (called "penstock"), which is then channeled downhill into the VFH™ and reunited back into the stream. The potential energy of water is converted into mechanical power at the VFH System, all without requiring a large dam and reservoir. The VFH Turbine™ enhances aquatic life and water quality by adding Dissolved Oxygen during our proprietary process.



Diverted river or surface water passes over a special screen where a pre-determined amount of water falls into a containment chamber and is gravity fed via a penstock to the VFH Turbine™. All debris, silt, sediment, and aquatic life safely travel over the screen to rejoin the original river.

HYDROSCREEN ENVIRONMENTAL FEATURES

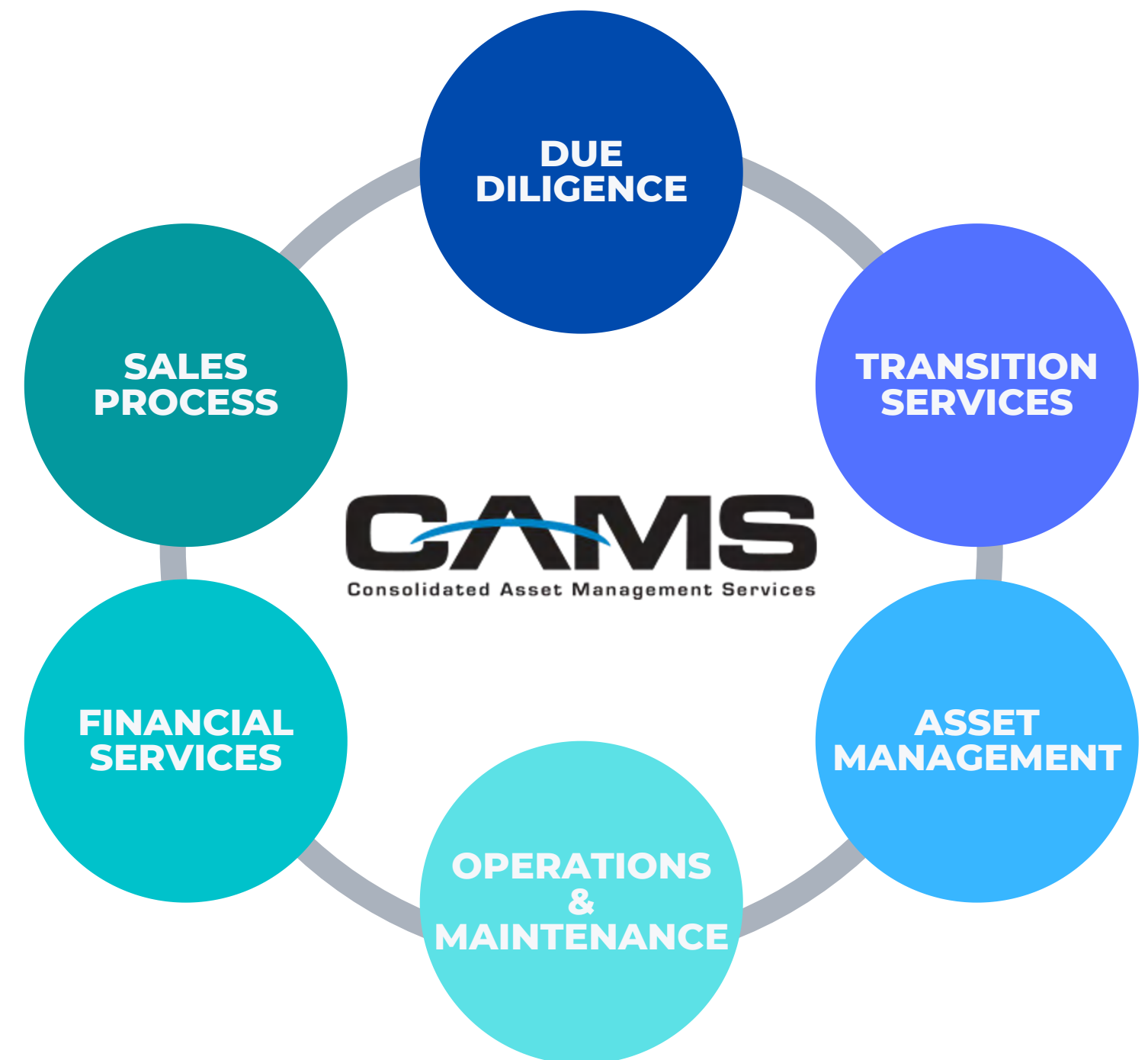
- All fish have safe passage
- No dam or reservoir is needed
- No mechanical parts are involved
- Very low maintenance is required
- Passive diversion channel (7' wide)
- System approved and used worldwide



Consolidated Asset Management Services

OUR PARTNERSHIP

- Green Power Technologies Puerto Rico has partnered with Consolidated Asset Management Services (CAMS) out of Houston Texas. CAMS brings years of Asset and O&M Management experience to our team.
- CAMS and its team of industry professionals have an extensive and successful track record developing, managing, and operating power generation assets across North America, Europe, and Latin America.
- CAMS currently has 35GWs+ of generation under management, with supporting services for IT, Environmental, Financial Services, Remote Operations Center and Staffing Services.
- Levering CAMS as a partner provides Green Power Technologies the depth and working knowledge of the power industry that will support all development, Asset Management and Operational needs for any size project.



VFH Manufacturing Partners

THOMAS BROTHERS HYDROELECTRIC

Thomas Brothers Hydroelectric have worked with GTPR for fabrication, design and oversight for over a decade. Thomas Brothers expertise, production capabilities, and manufacturing professionals also specialize at installing proprietary software, controls, monitoring, and security systems for commissioning the VFH Turbine™ hydro unit.

PRECISION MACHINE & TOOL WORKS

Precision Machine & Tool Works (PMTW) was founded in 1985 with one goal in mind: to provide our customers with outstanding product quality and service unparalleled in the industry. By using the latest technology and equipment, we are able to retain our highest standards of excellence and efficiency, as well as, maintain competitive pricing. From a single prototype to a thousand finished parts, our process allows us to complete your order in a timely and efficient manner. PMTW offers CNC milling and turning, 3D contouring, four axis machining, CNC turning, live tooling, barfeed and large surface grinding capabilities. Our in-house engineering allows us to design progressive dies and special machines. We have EDM capabilities up to 16 inches thick. Our customers benefit from our computer data base of frequently ordered parts which allows us to rapidly process repeat orders.





VFH Turbine™

AWARDS

- In 2012, Patrick was awarded the "Technology and Business of the Year" award for Latin America. This recognition was groundbreaking for renewable energy, specifically off-grid hydro systems that did not require dams or reservoirs.