



A multi-billion-dollar market disrupter that will triple the world's renewable power generation overnight.





Three Global Opportunities:

Tens of thousands of dams are not generating electricity at their maximum potential.

Over 95% of all dams are not used for Electric Hydropower

Millions of miles of water pipes are regulated by Pressure Reduction Valves that can be converted to generate renewable energy.

One Solution:

Magnetic Turbine Generator (MTG)

The ClearPower MTG is a hydropower aggregate that integrates turbine and generator into a single compact unit. This enables technically simple and low-cost installations, reducing civil engineering to a minimum. It can be installed at any angle, enabling optimum adaption to each site.



Technical Description

The Aquarius SMH (small modular hydro) is a low head axial turbine where turbine and generator are integrated, making a compact unit with a small footprint.

The turbine has a fixed pitch runner wheel and variable guide vanes. The generator is a permanent magnet synchronous machine, fully designed by ClearPower. The rotor of the generator with permanent magnets is fixed directly to the turbine runner, meaning the entire assembly has only one rotating piece.

On the upstream side, the Aquarius is installed using a simple bolted flange connection, and a suction pipe downstream completes the waterway. The control system features fully autonomous operation under remote surveillance and is adaptable to customer requirements which can include complex algorithms for optimized production.

ClearPower owns the exclusive rights to patents and technologies

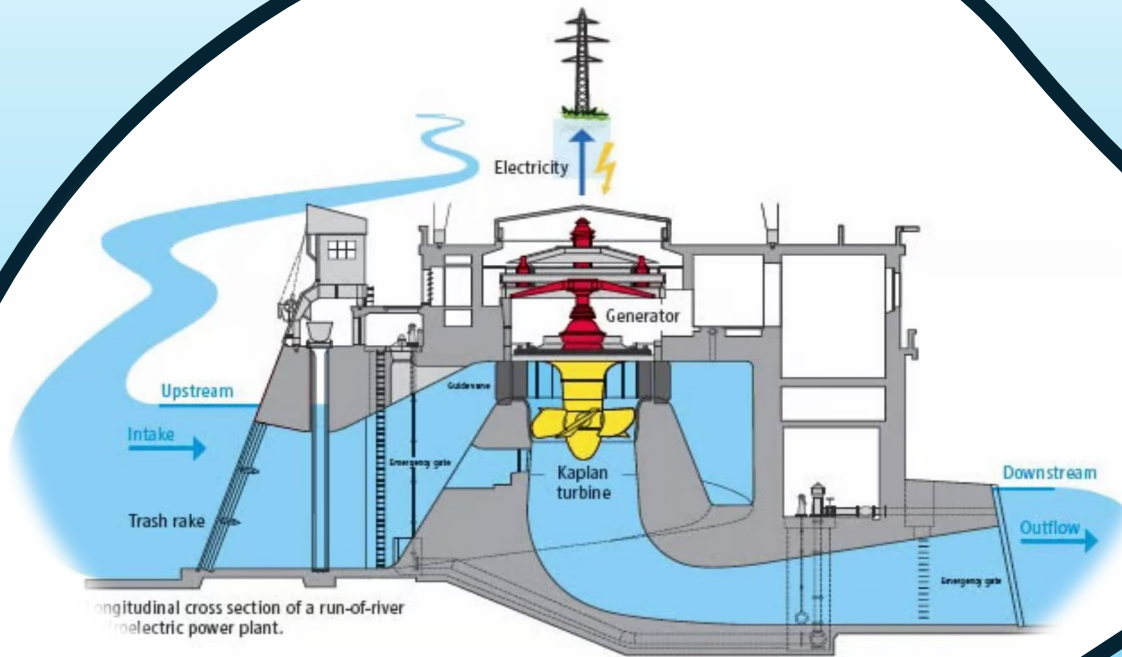
Retrofitting Existing Hydro Powered Dams for **Maximum Output**

A significant number of small hydropower plants globally, and particularly in the US, are not operating at their full potential because of various factors, such as lack of investment and outdated technology.

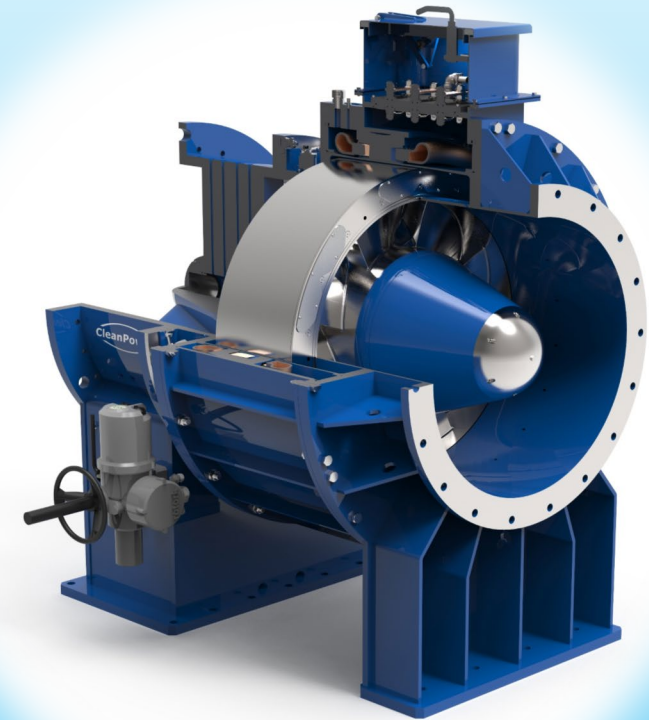
High demand is forcing government regulations to be eased to allow small hydropower dams to double their output, while funds are becoming more available.



Why is ClearPower Different?



We fit all of this...



...into this



Untapped Potential at Existing Dams

The University of Washington study found that nearly **83,000 small hydropower plants are operating substantially under capacity** and have the potential for this number to more than triple if all hydropower capacity were to be developed. This suggests an enormous potential for increased generation from existing and planned small hydro plants.

While the exact number of small hydro plants not generating to their maximum potential is difficult to pinpoint, it's clear that a substantial amount of untapped potential exists. This potential can be addressed through investments in modernization, improved technology, regulatory streamlining, and addressing water resource management challenges.

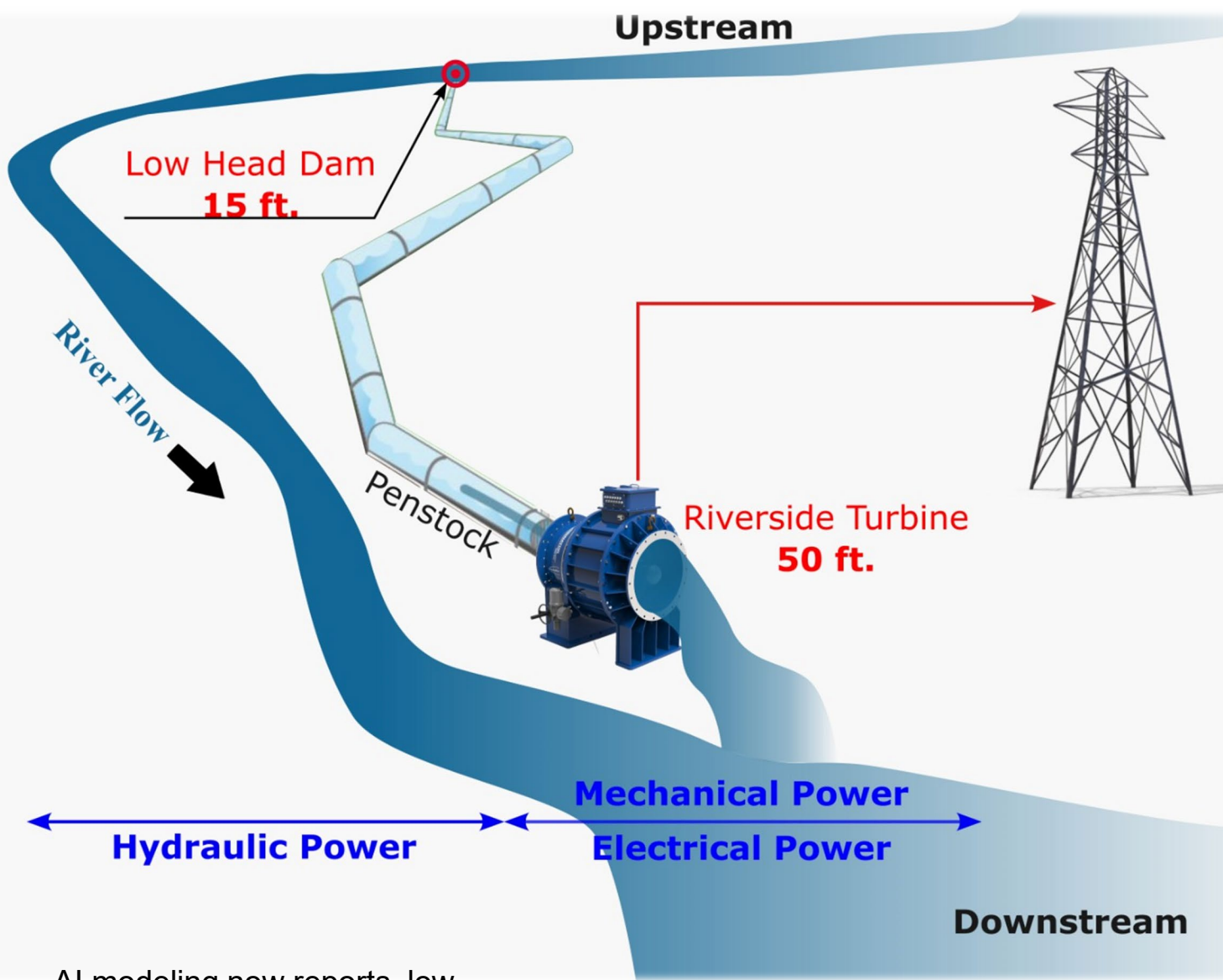
A small dam needing repairs for just 3 MW of power using traditional methods **can cost tens of millions of dollars**, while consuming months of labor and downtime.

Our proven solutions cost a fraction of these costs and can be installed on the existing penstock in one day.



The Department of Energy estimates that untapped hydropower potential from non-powered dams in the US structures built for purposes like water supply and flood control exceeds 24 GW, approximately 30% of current US hydropower capacity.

Modern AI tools claim the number is **exponentially** larger than previous studies, **much more**. In fact, all reports now point to over 400 Gigawatts!



Powering Low Head Dams

Traditionally, hydroelectric power generation requires 3 components:

1. Head: The height that water falls to the turbine
2. Flow: The volume of water available
3. Down Draft: The drop immediately after the water passes through the turbine.

Small dams have **volume and head**, but no room for **down draft or exit**.

Our modular turbine eliminates the need for the downdraft and can instantly add power to virtually any small dam in the world!

AI modeling now reports, low head dams could potentially generate **OVER 120,000 MW** if properly harnessed.

That's 120 Gigawatts, or roughly 60 full scale Nuclear Power plants.

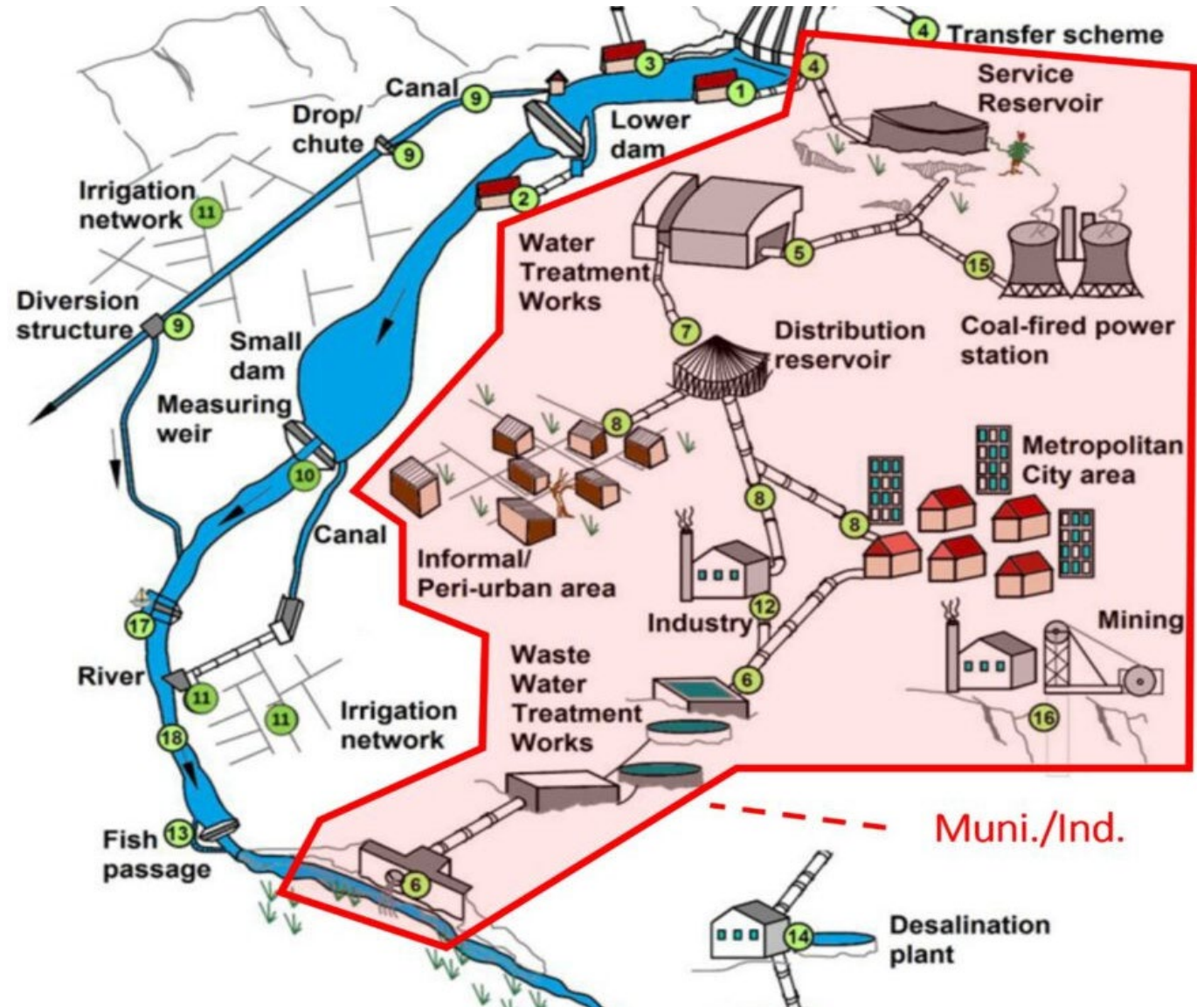
Bolt-on Energy from Street Pipes (Conduit Hydropower)

The globe regulates water pressure by utilizing obsolete **Pressure Reduction Valves (PRV)**.

This device breaks pressure down by blocking water flow. There are millions of these installed and every one of them is a complete waste of energy.

Through the process of pressure extraction, followed by a conversion process, our turbine achieves the same result as other technologies, generating clean, green renewable energy.

Just 10 feet of water pipe could equal the power output of 100 acres of solar!



Every circled number in the picture represents a source of renewable energy.

Global Warming

Climate change, with its devastating effects, poses the most significant and pressing threat to the planet and its inhabitants.

Our mission was to develop a solution that would decrease harmful carbon dioxide emissions and the other toxins contributing to global warming.

Mission accomplished. Even under the most rigorous conditions, our turbine produces less than one degree of heat. Documented.

If all the street pipes in the USA were used for hydropower at 90% efficiency, the potential electricity generation would **dominate the power industry.**

Estimates suggest that our water infrastructure could generate **Several Million Terawatt-hours** annually, relieving overloaded grids. Now there is a way.

Source: AI Google 2025, Accurate calculations would require detailed data on infrastructure and water flow.



See pipes?
We see 200MW!

New Energy Potential

Retrofitting Existing Dams

Market Size: Over 83,000 Sites

USA: 2000 + Small Hydro

Our bolt-on solution can easily add
3 MW to each of these sites.

Global Potential:

3 MW x 83,000 = 250,000 Megawatts

USA Potential:
3 MW X 2,000 = 6,000+ Megawatts

Powering Low Head Dams

Opportunity: Low Head Dams that have never generated electricity.

The globe has countless lower head dams that were built over the last 1000s of years to divert water to local villages, farms and industries.

None of these small dams have ever been considered for relevant power generation and now can easily be converted into local sources of significant renewable energy. Since our bolt-on application does not require the traditional steep incline needed before, we only need to focus on the volume of water. Fortunately, low head dams have plenty of that!

How many small dams are we talking about?

- USA: Over 100,000 non-powered dams
- South America: 1,000s no reliable data
- Canada: 10,000 + non-powered dams
- Europe: 100,000 est. non-powered dams.
- Asia: Countless, lack of data, estimated well over 100,000
- Africa: Countless. (however, Africa is also noted as a potential to outproduce the world with its thousands of rivers.)

EXAMPLE: USA

Locations: 1,000 (Largest 1% of known low head dams)
Average power potential: 500kW

Total: 450 Gigawatts

Conduit Hydropower

The Untapped Market

Conduit Hydropower is energy generated by harnessing the energy in any water pipe.

These pipes include:

- **Municipal water**
- **Waste pipes**
- **Industrial plant outfalls**
- **Aqueducts**
- **Penstocks**
- **Mining water supply**
- **Slurry lines**
- **Reservoir supply lines**

All the above sources remain untapped, mainly due to the lack of technology. Our turnkey solution overcomes this problem and can transform any of these markets into a source of unlimited renewable energy potential.

Potential: Terawatts

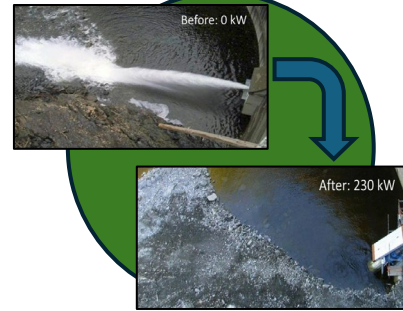
Example:

Converting large state water supply Pressure Reduction Valves:

2 MW per location, over 100,000 available

**200 Gigawatts of untapped
energy, equal to 100 Nuclear
Power Plants.**

Notable Installations:



Hegset Dam, Norway, October 2010

EcoFlow 250kW

The Turbinator pilot model installed was completed on 14 October 2010. It was operational over 98% of the time. Most of the downtime was after automatic shut-downs due to nightly power outages. The pilot plant delivers 0.35GWh during 1500 running hours in 2010 and delivered 0.35GWh (average of 234kW).

Read About it:

<https://www.waterpowermagazine.com/analysis/installing-the-turbinator/?cf-view>



Gåseflå dam, Norway, May 2017

The turbine installed at Gåseflå dam in Vennesla utilizes the minimum water flow slip to produce clean, renewable hydroelectric power for around 90 single-family homes.

Read About it:

<https://energiteknikk.net/2017/05/miniturbine-gir-mer-fornybar-kraft/>



EDF Ravière Dam, Nov. 2018

As the eco-flow release has increased in 2014, for the periods where the main power station is not running, EDF sought a compact turbine solution that would fit the narrow space available between the existing bottom outlet and other existing civil works.

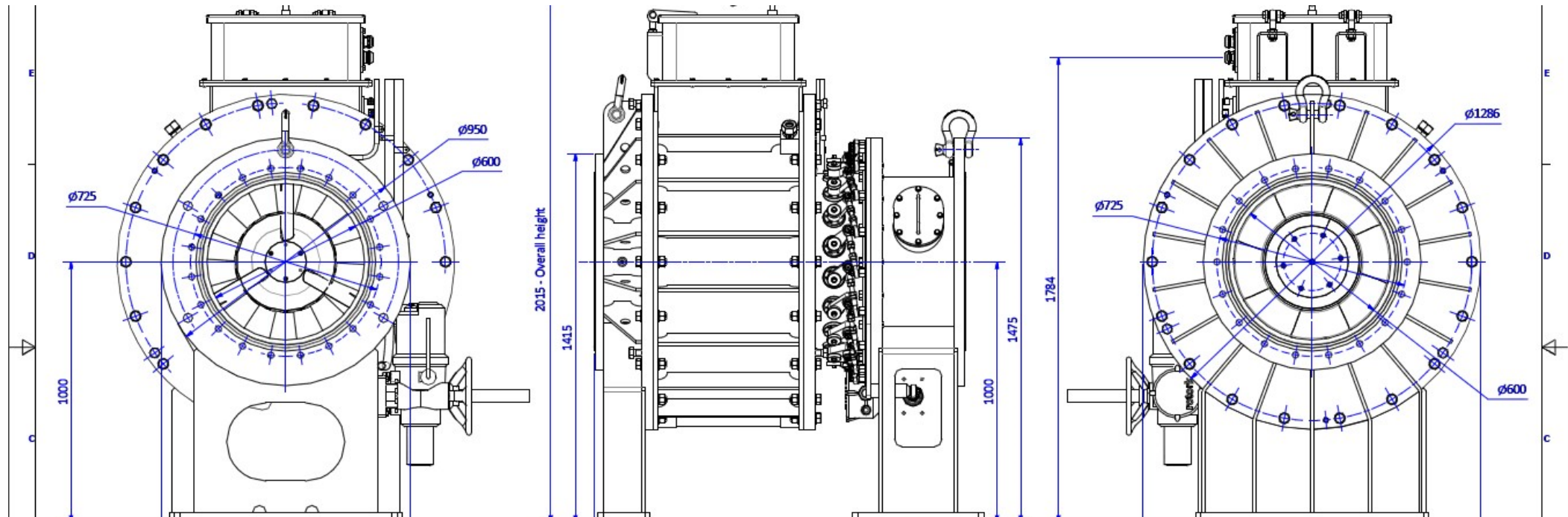
Following technical evaluations and site visits to existing installations in Norway, EDF selected the Turbinator. Besides the advantageous small footprint, it was also considered reliable because of its simple and robust design.

Read about it:

<https://www.waterpowermagazine.com/analysis/edf-to-install-eco-flow-turbinator-5972707>

<https://x.com/CleanPowerAS/status/928639320113676288>





Frequently Asked Questions



Aquarius 1.5 G

Our FLAGSHIP Model. Built for variable flows and conditions, perfect for low head dams with seasonal flows, large water pipes.

Power Output: 1 to 5 MW
Rated Efficiency: 94%



Aquarius 1.5 M

Built tough, the M model is best used for dependable flows. Suitable for mining, effluent, construction and other wastewater outputs or slurry that might have solid waste.

Power Output: 500kw to 5 MW
Rated Efficiency: 90%



Aquarius 1.5 E

When the environment demands. Designed with all internal composite materials, irrigation safe and modified blades for fish safety, and other environmentally safe precautions.

Power Output: 500kw to 3 MW
Rated Efficiency: 90%

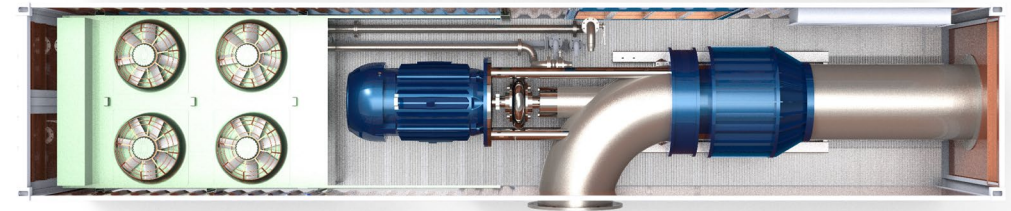
Aquarius Model 2.0

The Aquarius Model 2.0 SMH was specifically designed for quick low head dam and dam retrofits.

Using our patented rim driven turbine, with an exterior generator, we can achieve over 92% efficiency at a fraction of the cost of our all-in-solutions.

These units are mounted in a patented customized container, turnkey ready for your water supply or penstock.

With power generation of 300kw to over 3.5 MW, the SMH 2.0 is perfect for almost any gravity fed water source.

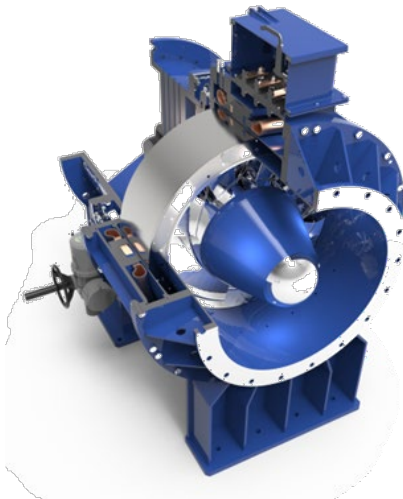


Available Configurations

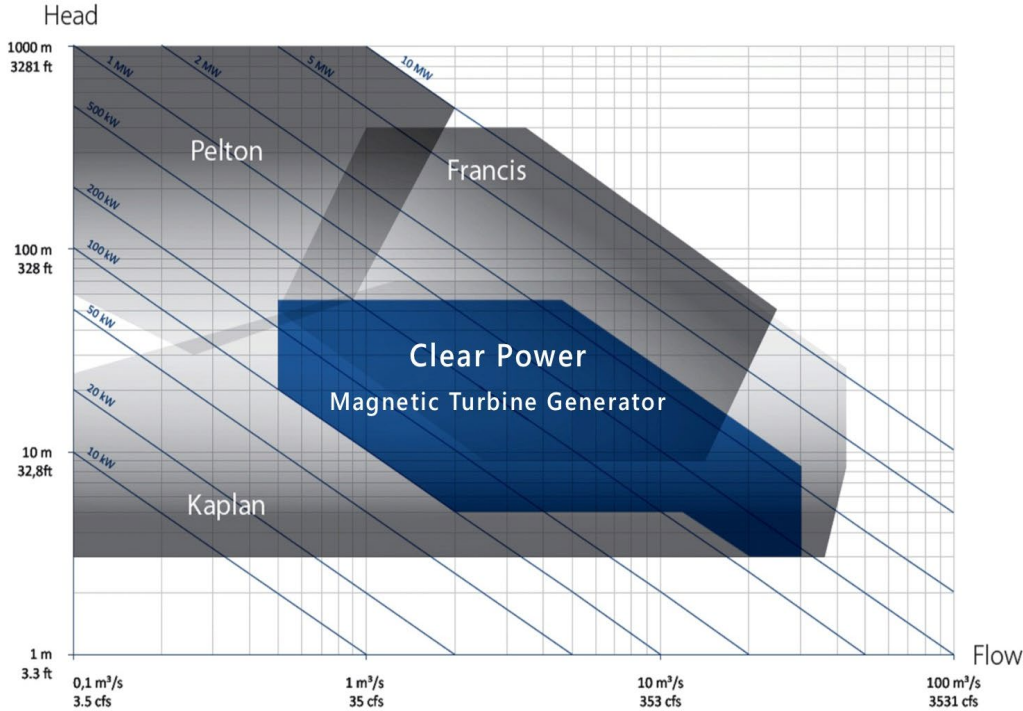
General Specifications

Standard Power Range	100 – 4300 Kw
Total Efficiency	>90% (turbine + generator)
Flange Dimension	PN6 (DIN-EN 1092-1)
Surface Treatment	Double layer epoxy paint
Maintenance	Programmed revision according to O&M manual at three year intervals
Life Span	Up to 50 years
CE-marked	YES
IP-Class	IP68
UL Certification	Power and Controls

Voltage	400 – 690 V
Grid Frequency	50 or 60 Hz 3-phase
Power Factor	Cos > 0.95 at full load
Main Valve	Foundation Steel



Turbine mapping





General Questions

What is an Aquarius Turbine Generator “SMH”? (Small Modular Hydro)

The Aquarius Turbine Generator Power System is a bolt-on “water-to-wire” system that generates clean, renewable energy from excess head pressure in gravity-fed water pipelines.

How does the Aquarius Turbine Generator work?

The Aquarius Turbine Generator converts water pressure to energy using a uniquely designed patented “all in one” rim driven Kaplan turbine and generator.

How much electrical energy can be produced from an Aquarius Turbine Generator unit?

A single unit can produce 100kW to 5000kW of renewable, zero-emissions electricity, depending on the flow and head pressure conditions at any given site. Multiple units can be used on a single site to generate larger power quantities.

How can I determine how many megawatt hours of electricity the Aquarius Turbine Generator system will produce in a year?

There are 8760 hours in a year, the capacity of your system as expressed in kilowatts (kW) which can then be multiplied by 8760 to determine the annual potential power production total in kilowatt hours (kWh). That power production is then multiplied by an efficiency factor that considers how often a system is flowing under peak conditions. The AGP efficiency factor of 94% is multiplied by the potential power. Divide by 1,000 to arrive at a close estimate of MWh that will be produced from your system.

Where can the Aquarius Turbine Generator be used?

Aquarius Turbine Generator is suitable for all water transmission and distribution pipelines, penstocks, wastewater pipelines, industrial pipelines, in electric plant waterways, and any other pipelines with sufficient flow and pressure.

Site Condition Questions

What size pipelines are suitable for the SMH?

The Aquarius Turbine Generator is suitable for the purposes of generating electricity for grid and off grid pipelines ranging from 18 to 144 inches.

What flow velocities are suitable for SMH?

Unlike conventional hydropower technologies, The Aquarius Turbine Generator can operate in a wide range of water velocities, including lower head circumstances.

What is the risk of cavitation when using the Aquarius Turbine Generator?

Anytime a device or piece of equipment is placed within a pipeline, the risk of cavitation exists. The Aquarius Turbine Generator is designed to limit the possibility of cavitation over a wide range of conditions typically found within pipelines.

How much pressure will an Aquarius Turbine Generator extract from my pipeline?

Aquarius Turbine Generator is a modified Kaplan turbine system; it can be set to extract a minimum amount or all pressure from a pipeline. The more extracted, the higher the power output.

How much pressure will an Aquarius Turbine Generator system extract from my pipeline when in the stopped position?

In the stopped position, the Aquarius Turbine Generator will extract up to 1 PSI, allowing for virtually normal system operation.

How is the SMH “generator” cooled?

Large amounts of water travel through the IGP which forms a thermal exchange with the generator stator, which provides excellent cooling. No separate cooling is needed.

Electrical Questions

How do I use the electricity generated by an Aquarius Turbine Generator?

The electricity generated by an Aquarius Turbine Generator can be used immediately on site or to directly power a local device or sold and transmitted to the grid.

What kind of voltage is produced by the SMH?

Aquarius Turbine Generator systems are designed to generate 400 to 690 volts. Other configurations are possible.

What is the IP rating of the generator?

The generator is fully sealed and submersible (IP68) for intermittent periods. There is no separate powerhouse or vault structure needed.

Finance Questions

Can the Aquarius Turbine Generator installation be financed?

Working with renewable energy project developers and its partners, ClearPower provides many financing options for its clients. Options include: PPA-backed financing, leasing and 100% finance packages. The inspiration for ClearPower is to install the unit at no cost to the consumer, and then become the consumer’s onsite, long-term, low-cost energy supplier.

Why will buying my facilities power onsite be so much more economical?

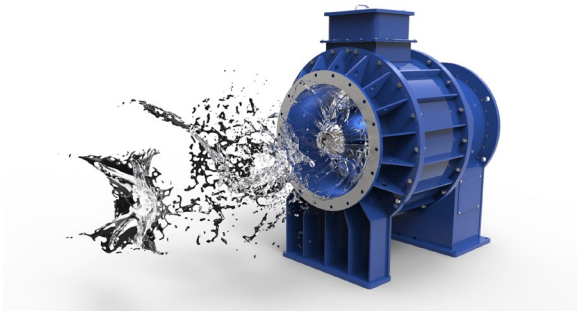
Utility bills for electricity are derived in three parts:

A power generation portion (the place your electricity is generated), Transmission (payment to the grid company that delivers the power from the generator to your company) and finally the Utility portion (whoever oversees and manages your account). All Three charge for their services.

By purchasing power generated onsite, you can virtually eliminate over 40% of your billed usage by removing the need for utility and transmission.

Does the Aquarius Turbine Generator qualify for federal renewable energy incentives?

Aquarius Turbine Generator qualifies for the Investment Tax Credit (ITC) and Production Tax Credit (PTC), as well as other incentive programs.



Model
2.0



The **Aquarius Turbine Generator®** is a hydropower aggregate that integrates turbine and generator into a single compact unit. This enables technically simple and low-cost installations, while reducing civil engineering to a minimum. It can be installed at any angle, enabling optimum adaption to each site.

Technical Description

The Aquarius Turbine Generator is a low head axial turbine where turbine and generator are integrated, making a compact unit with a small footprint. The turbine has a fixed pitch runner wheel and fixed guide vane. The generator is a permanent magnet synchronous machine. The rotor of the generator has permanent magnets which are fixed directly to the turbine runner, meaning the entire assembly has only one rotating piece. On the upstream side, the Aquarius Turbine Generator is installed using a simple bolted flange connection, and a suction pipe downstream completes the waterway. The control system features a fully autonomous operation under remote surveillance and is adaptable to customer requirements which can include complex algorithms for optimized production.

Turbine Design

The turbine was designed by Mr. Evald Holmén (Evald Holmén Consulting, Stockholm, Sweden), an internationally renowned expert on hydropower turbines. The design is based on a Kaplan turbine, by transforming the waterway to the required straight flow, as the model turbine is a normal Kaplan design with a spiral casing. The number of runner wheel blades will depend on head and water flow on each site.

Advantages

The design of the Aquarius Turbine Generator is focused on achieving a simple and robust construction, where a governing design tradeoff has been peak efficiency.

The salient features are:

- Simple and robust design with only one rotating part.
- Small footprint for cramped installation sites.
- Simple installation to a pipe flange.
- Limited civil works: Only a simple concrete foundation is needed to ensure stability.
- Sealed generator directly and efficiently cooled by the water stream.
- Shelter is not needed - can stand outdoors.
- Containerized turnkey solutions are available

Generator Design

The generator was designed by Øystein Krøvel, PhD. It features a permanent magnetized synchronous generator with surface mounted magnets. The stator features a classic integer distributed winding with random round wire coils. The number of poles will be chosen based on specific site data. A particular feature of the generator is the wet air gap, requiring waterproofing of both the magnets and the stator, which results in an enormous distance between rotor and stator. The permanent magnetized rotor is advantageous compared to induction and field wound synchronous generators with large wet air gaps. The generator is directly connected to the grid without the converter commonly used between permanent magnetized machines and the grid. Permanent magnetized generators cannot regulate the voltage and/or the reactive power, as the reactive power flow depends thus on the grid parameters (i.e. the voltage at the terminals.)

The design must consider the different operating points to choose a suitable voltage drop that ensures the generator can operate within the expected range. Seasonal or more permanent grid changes can be accommodated using a stepped grid transformer. Since the generator and turbine designs must match, this implies some restraints such as turbine speed (maximum rpm and synchronous speeds) and diameter. Integrating the generator around the turbine produces a slim and compact machine with superior overall performance.

Easy Installation

Compared to a traditional small hydropower installation, the Aquarius Turbine Generator demands only very basic low-cost civil works. It is connected upstream to a pipe flange with a motorized valve that is governed by the control system. Bolting the generator to a concrete slab will safeguard stability. A downstream suction pipe ensures a continuous water stream all the way to the downstream water level.

The control system can be installed in an existing building near the Aquarius Turbine Generator. To enable remote control via the internet, this location needs an internet line (can be wireless via GSM/GPRS/CELLULAR or similar). Signal cables are run between the control system and the Aquarius Turbine Generator, and power cables from the Aquarius Turbine Generator to grid transformer via the control system. In a traditional small hydropower installation, the non electromechanical parts can cost 70% of the total investment. Due to the simplified installation, these are expected to be less than 50% of the total investment of an Aquarius Turbine Generator plant.

Our Design is not Revolutionary, it is Evolutionary.



Who Is the ClearPower Customer?

Outfalls are the New Penstocks

The parallel between Aquarius and municipal outfall pipes and actual hydropower penstocks is uncanny. A penstock is a pipe or conduit that conveys downhill flowing water (creating head pressure) to a turbine headgate. Once the water travels through the turbine, it then directs the flow to a river or another marine environment.

An outfall pipe usually starts out at a facilities water treatment plant, then travels downhill (creating head pressure) directly to a river or another marine environment. All that is needed to convert an outfall into a penstock is the addition of the turbine.

Pressure Relief Valves

Water bearing pipes were standardized over two millennia ago, carrying much needed water from large watersheds (large bodies of water at higher altitudes, refilled by rain or melting ice), to the communities at lower altitudes. These huge aqueducts and wooden made pipes had tremendous pressure in them produced from the flow of the water, and more importantly, the weight of the water. To accommodate the end user, the pressure had to be reduced. Hence, the creation of the “pressure relief valve” (PRV). Since the growing communities had fossil fuels to burn for energy, and because the use of electricity was not yet commercialized, the idea of using that pressure for hydroelectric power wouldn’t start until the last two centuries.

The PRV is a simple device. It clamps down on the inside of a pipe, limiting the flow by blocking it, and thereby reducing the pressure of the water that escapes through the valve. The blocked high- pressure water that stays behind the valve is pure energy. This PRV technology is still used in every corner of the globe, unchanged. In fact, if you replace an old nonfunctioning PRV with a new one, the only difference you would see is a bright shiny paint job.

After two centuries of use, PRVs’ are failing at an alarming rate. Reports show that over 24,000 of the installed relief valves are not functioning in the USA alone. They are the number one contributor to the 237,000 water-main breaks that happen every year in the U.S. That’s 700 a day, and almost one every two minutes. The problem is that they are very expensive, and entire water grids must be shut down to replace them.

There is a better solution: convert the pressure into electricity rather than waste it. ClearPower has that solution.

Advantages Of The Aquarius Turbine Generator

ClearPower gives its industry and municipal customers a way to contain energy expenses by generating renewable electricity from the water already flowing through their water intake and outfall pipelines.

Industry

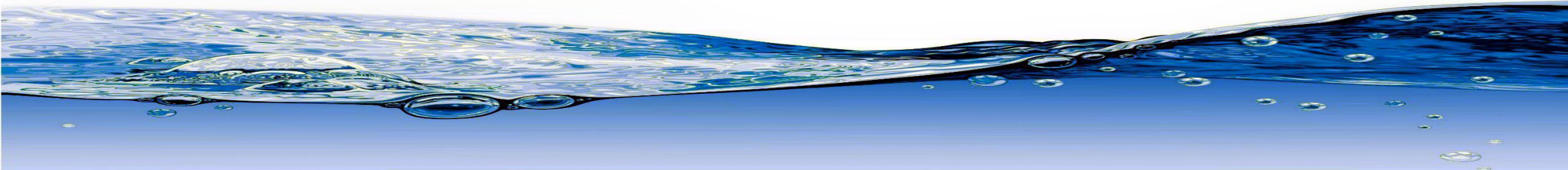
Industrial facilities utilize billions of gallons of water every day for processing and cooling functions. The same energy that pushes the water through Aquarius pipelines (gravity) can now easily be converted into pure green renewable electricity. Along with enjoying a large discount on electricity, your company is already buying local and federal incentives are readily available for renewable energy generation.

Municipal Waste-Water

National Public Works reports that wastewater treatment plants serve 189.7 million people and treat 32.1 billion gallons of water every day. Electricity is the single largest expense for wastewater facilities, it often represents over 40% of a water utility’s annual operating budget. ClearPower can provide municipalities with an opportunity to save enormous amounts of electrical expense, reduce carbon emissions and reduce reliance on grid-based power by simply using their existing water infrastructure to generate low-cost renewable energy.

Irrigation

Now the water that is used to produce our food can also produce gigawatts of electricity. The ClearPower solution is ready to be used in large agricultural water pipelines to generate off grid power and is ideal for use where agricultural regions are converting open canals to pipes or where any closed conduits are moving irrigation water. As the demand for both water and electricity continues to grow, ClearPower can provide a simple solution for harnessing the untapped energy potential of flowing water to produce sustainable, lower cost electricity.



The New Breed of Hydropower, No Dam Required!

ClearPower North America, LLC

ClearPower technology harnesses the power of water to provide a reliable, cost-effective, sustainable source of clean energy. Its patented technology is a new breed of small hydropower that taps gravity-fed pipelines and other water sources such as municipal and industry intake, waste, treatment and discharge systems.

ClearPower turbine generators are simple and efficient, with virtually no impact on the surrounding environment. Our unique technology can generate electricity at a fraction of the cost of traditional generating platforms. The ClearPower platform has a low cost of installation within a small footprint.

Combined with the incentives provided by various taxing authorities, allows us to create sustainable, economical generating solutions that can be used for almost any pressurized water pipe or penstock, including your company's gravity fed outfalls.

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ClearPower



AQUARIUS



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INCREASE PROFITS.