



# Proposal for Alternative Energy Project in the Racine Quarry Lake Park

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Developed by Ralph Bencriscutto of Tower Energy International LLC for the efficient storage of unused renewable or generated power as a by-product of hydrolysis and the goal of carbon neutral elimination of fossil fuel dependence.

This document details the analysis of the Gravitron Ballast System proposed by Ralph Bencriscutto and Tower Energy Partners. The analysis covers the energy production possibilities using the movement of the tanks as well as the use of a Rankine cycle to capture waste energy from hydrolysis to store energy. The resulting production cost of hydrogen is greatly reduced by the use of cogeneration and waste heat to subsidize the production, storage and distribution.

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## **Introduction**

The Gravitron Ballast System was an idea generated by Ralph Bencriscutto of Tower Energy International LLC in Racine, Wisconsin. The concept involved breaking down distilled water into its components, hydrogen and oxygen, using hydrolysis units that utilizing the stored energy of water next to the site. The technical documents of the alternative energy concept are attached to this proposal.

The by products of this reaction are heat, compressed gases of hydrogen and oxygen and heat all of which will be utilized on site for other uses.

The system in the quarry is designed to work well with the additional use as a recreational center as well as utilize the mass of the water for other purposes. The project in totality would involve several other businesses to benefit from the by products of the hydrogen production on the same site. We also envision the production facility itself to become a tourist attraction and have other commercial results.

## **Outline of Project**

### **Hydrogen Production**

The hydrogen production involves a packaged hydrolysis unit that is commonly used for on site fuel stations that provide hydrogen to the new hydrogen fuel cell cars now available in CA. This facility will also provide hydrogen ready for the auto market on site at below market pricing due to the co-generation and alternative symbiotic relationship of the placement next to the quarry and use of the water.

### **Oxygen Production**

For every KG of hydrogen you get 2 KG of O<sub>2</sub>. This oxygen is normally expelled into the atmosphere. This facility however will capture the oxygen for resale or use the O<sub>2</sub> on site to raise fish.

### **Stored Gravitational Energy**

The normal operation of the hydrogen results in gasses that are compressed. This stored energy will be diverted to a storage system that is placed at the bottom of the quarry. This energy will be accumulated during off peak power periods since the machine will be using off peak grid power from the utility and a lower cost. During the day this stored energy will drive the stored gas ( ballast ) to the surface and the resulting force will be converted to energy through a generator. This alternative energy will be capturing the force of gravity and reversing the direction of forces to the surface ( instead of down ) through the force of buoyancy. After discharging the gas at the surface for further processing the tank will be allowed to fall ( again utilizing gravity ) to generate more power. It is this process that is using the stored energy of the quarry lake.

This mechanism to generate electricity would extend out of the water and look like a windmill without the propellers. The movement of the unit would be an entertaining system to watch and would attract attention nationally as a new energy concept.

## **Geothermal Cooling**

The reaction of hydrolysis requires mechanical cooling to maintain production temperature parameters. We are proposing using the cold quarry water to cool the reaction and eliminate the need for mechanical cooling. This heat added to the quarry initially will not affect the lake temps but if the process was expanded it could warm the lake to extend the swimming and recreational use of the lake. The process also will filter and clean the water during production.

## **Fish Farm Added to utilize the Oxygen**

The lake is a perfect area to raise fish. An area would be penned off on the west end that could be used to raise a variety of fish. A tourist area would be added so people could look at the operation and also fish off the piers that would be added. The oxygen by product of the hydrolysis would be added to the fish water from the bottom and oxygenate the water which the fish need to grow faster. The warmed water would also speed their growth to market.

## **Hydroponic Area added Next to the Production**

The water from the fish farm would be pumped into a filtration system that will feed plants in a greenhouse located next to the facility. Heat from the hydrolysis would also be used in winter along with solar passive or panel supplemental system. This aquaponic symbiotic system that feeds off the production of hydrogen will create a commercial center that can be expanded on the site to service all the operations and utilize the process results.

The power generation analysis detailed here examines the feasibility of generating 1.5MW using existing specifications from existing technology. The factors that are changed to determine the feasibility are the pulley diameter, cycle time, and size of the tank.

## **Fuel Station and Retail Operations**

The hydrogen system would have a fueling station that could support up to 72 cars in the Racine area. We would initially propose a leasing agreement with Toyota for the Mirai hydrogen cars to use the fuel. The city would be the logical target to lease the cars to start but the market is there for this car to be sold or leased in Racine. The system can be expanded by adding production modules as the market develops.

## **Benefits of Project for the City of Racine**

### **Jobs Created**

We envision the creation of over 50 jobs as the project develops.

### **Investment Required**

We estimate the project will cost seven million to build

### **Land Lease**

The city would benefit from increased tax base revenue as well as a lease agreement for the property. All recreational aspects of the area would be preserved or expanded to better utilize the lake.

### **Racine could be the center and starting point for a conversion of fossil fuels to hydrogen.**

The only reason hydrogen doesn't dominate the auto industry is the cost of the fuel relative the gasoline and the lack of distribution on the local market. This system lowers the cost of fuel for the car and creates distribution for the local market. As the system proves successful the expansion of the market would extend outward from Racine since the compressed gas could be shipped to other stations. Other quarries would also use the prototype for the same purpose and Racine would be a national model. No system like this currently exists anywhere in the world.

### **Global Warming**

It is our goal to have this system expanded and convert the auto fuel market over time to hydrogen which is made from splitting water. The re-combination of hydrogen and oxygen during combustion has only the by-product of water. This is the answer to global warming and the hydrogen can be used in fuel cells to power almost anything – even your cell phone.

### **Meeting Request**

Tower energy would like to meet with the city to discuss the project further and better understand the parameters.

*Sincerely*

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