

# THE HISTORY AND FUTURE OF BROWN'S GAS

*Research into Brown's gas, or oxyhydrogen gas, continues apace around the world, with applications being explored in diverse fields including welding and automotive industries and even in the transmutation of nuclear waste.*

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*Yes, my friends, I believe that water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light...*

— Jules Verne, *The Mysterious Island* (1874)

Whether we look to the monuments of Egypt or Tesla's wireless transmission, for centuries there has been evidence that "over-unity" technologies or so-called "free energy systems" are within our grasp. Inventor Yull Brown developed a "water engine", known as the "Brown's gas electrolyser". Although it is not a "free energy technology", it does allow for possibilities of better energy efficiency and, in some cases, claims of "over unity".

Most people say that "it is unbelievable to run a car on water", but during the Second World War there were several rumours of cars, tanks and other military transport vehicles running on nothing but water. It had been thought that when oxygen and hydrogen were separated, hydrogen became a dangerous fuel and was too bulky to store in a gaseous form, especially for automobiles. These are the same arguments that Brown's gas researchers are contending with today.

What Yull Brown sought to create was a unique mixture, popularly called "HHO gas" or "oxyhydrogen gas". Although many prefer to call it "Brown's gas", it is also known as "Rhodes' gas" or "hydroxy gas". Brown did most of his research in Australia, although he was born in Bulgaria in 1922 (he died in 1998). He also lived in southern California, where research scientist Adam Trombly met him. Trombly recalls:

"Yull Brown was a former Bulgarian engineer working for Germany who was arrested and imprisoned by the Russians after World War II. He escaped from a gulag, having survived many years of torture. He was helped by the CIA to immigrate to Australia under his well-known pseudonym. One day he arrived at the gates of the Greystone Institute in Evergreen, Colorado. Christopher Bird, [co-]author of *The Secret Life of Plants*, had directed him there. Chris was my friend and hoped that I could help Yull develop the technology and bring it into common use." (Trombly, 2014)

Brown held two major US patents—4,081,656 (March 28, 1978) [<http://tinyurl.com/kcgq6cw>] and 4,014,777 (March 29, 1977) [<http://tinyurl.com/lwwkr9f>], although his technology is now in the public domain. However, Brown was not the first to try to achieve a unique combination of oxygen and hydrogen mixture. William A. Rhodes was granted his own US patent, 3,310,483 (March 21, 1967), for the "Multicell Oxyhydrogen Generator" [<http://tinyurl.com/ky5zhzd>]. Neither man was the

first, nor most likely the last, as research into oxy-hydrogen energy continues today, all over the world, with engineers seeking to find the best "stoichiometric" mixture of oxygen and hydrogen to establish "over-unity" devices.

### The History of HHO

Ultimately, water can be separated into its constituent elements, oxygen and hydrogen, through a process known as *electrolysis*. It functions by passing an electric current through electrodes (a chemical cell with an anode and a cathode). The standard formulas for water electrolysis and combustion are...

- electrolysis:  
 $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
- combustion:  
 $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

In the standard electrolysis of water, hydrogen gas will form off the negative cathode and oxygen off the positive anode.

According to Henry "Andrija" Puharich (1918–1995), who in 1983 was awarded his own patent, 4,394,230, entitled "Method and Apparatus for Splitting Water Molecules" [<http://tinyurl.com/klwneex>],  $\Delta G$  249.68 Btu is required to split the molecules (an energy-absorbing reaction) but  $\Delta H = 302.375$  Btu of energy (heat or electricity) can be released when the gases, hydrogen and oxygen, are ignited and recombine into the end product (the exhaust) as water (Puharich, late 1970s). That's right: the illustrious Dr Puharich—who was a medical doctor and a close colleague of the authors, and who brought Uri Geller from Israel to the USA for scientific study for

the first time—also had a patent for a similar technology.

Clearly, Brown's gas is more than simply electrolysis. The process begins when the electrodes are submerged in water. Next, the elements are not completely separated (although there are some claims that they are first separated and then slightly recombined). Yull Brown had sought to find a specific mixture of not just separated  $\text{H}_2$  and  $\text{O}_2$  but of HHO combined, to create a more powerful fuel.

HHO is also unique for welding as it does not have a set burning temperature. Furthermore, HHO creates a

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very cool flame that can be touched briefly without burning the skin, although it can be used to weld metal or destroy a brick. When the flame is placed on a metal, ceramic or glass surface, for example, it can produce temperatures of over 2,500°C (4,532°F). On average, the temperature of the Brown's gas flame is about 135°C (275°F) in open air. When the same flame is applied to aluminium, without any torch adjustment,

the aluminium can heat to 702°C (~1,295°F). It can even get hotter when the flame is applied to brick, where the temperature can reach 1,704°C (~3,100°F) with the principal by-product of water. (Wiseman, 2012)

There are seven diatomic elements in nature, and hydrogen and oxygen are two of them. This means that they are homonuclear molecules, where one hydrogen atom will link directly to another hydrogen atom—and the same for oxygen. However, Brown's gas is distinct in that it has both diatomic and monatomic atoms. Although there are various ideas of exactly what is taking

place, the general theory is that HHO is not a standard diatomic structure. Even the bonding may not have the standard hydrogen bond strength (~23 kJ/mol) but a weaker energy bond state. Specifically, what Brown's gas researchers are trying to achieve is to discover where the electromagnetic field within the atomic structure changes from diatomic to monatomic, as the "bonds" are really magnetic attractions called *van der Waals forces*.

Therefore, a Brown's gas electrolyser, instead of just splitting the  $\text{H}_2\text{O}$  generally, has a "bubbler" or a secondary chamber where gas, first attracted to the electrodes, becomes dislodged as highly energetic bubbles. Some say that it is in this chamber that the  $\text{H}_2$  and  $\text{O}_2$ , already



Dr J. J. Hurtak, photographed with Schauberger technology. (Photo: Dr Desiree Hurtak)

divided, become HHO, while others claim that the separation is more of a weakening of the bonds (in the first chamber) and this is why it takes less energy to make the gas. Of course, there are various HHO electrolyzers as well, each producer making their own claims to fame.

So, Yull Brown discovered that by using relatively small amounts of carefully tuned or pulsed electricity across submerged electrode plates, the atomic bonds of water break uniquely into HHO thousands of times more efficiently than with the high-amperage, traditional systems. Consequently, the supposed monatomic forms are associated with gas bubbles.

According to Better MPG, the monatomic molecules are like "free radicals" seeking to bond, and they can have as much as a 3:1 energy yield advantage over the regular diatomic hydrogen and oxygen.<sup>1</sup> The diatomic form is mainly there for the stability of the fuel.

Some inventors add that the key to the efficiency may be the pulsing current sent to the submerged electrodes: positive-going square-wave pulses are gated and pulse-width controlled at frequencies carefully tuned to match the "capacitance" of the spaced-apart negative and positive plates (Kawai and Fujiwara, 2003).

Yull Brown was not claiming "free" energy but a "better return on the dollar". Of course, it takes electricity to get the reaction started, but we are also paying a lot for gasoline at the pump. Results do vary, from an increase of 10 per cent plus of gas mileage when used as an energy booster in an existing car system to claims of much more energy, including over-unity.

Another key to the process, according to alternative energy writer Steve Windisch, is that when a "perfect" mixture of 66.67 per cent H to O is established, there will be an implosion instead of an explosion (perhaps the result of the gas recombining into water) (Windisch, 2008). Some suggest that this comes from the state of monatomic hydrogen and this is why there exist claims of "over unity" where the quantity of exothermic (net additional) heat energy released is greater than the energy used to make the Brown's gas. Needless to say, there is a lot of controversy over this. If this excess energy is purely from the monatomic state of H and O that exists prior to combustion, then the state must be maintained by some type of high energy field.

This is what the inventor Stanley Meyer claimed to have been able to create with a "gas gun" using argon

and lasers. Technically it is unclear what the trigger is or what the real state of HHO actually is. Moray King (2001) and others do not believe that it is simply the hydrogen that is causing the excess energy, but that it is possibly what King calls *charged water gas clusters*. These clusters create a type of plasmoid or plasma vortex ring. This is perhaps why Brown's gas has an *implosive* nature. Yull Brown said: "Explosions are destructive. Implosions are creative."<sup>2</sup>

From the late 1920s, the Austrian naturalist, scientist and engineer Viktor Schauberger (1885–1958) was working with vortices of energy also using a "specialised" water. This is why Adam Trombly affirms that when we speak of Brown's gas, we need to acknowledge immediately that it was actually Schauberger who first observed the most important phenomenon associated with the stoichiometric mixture of hydrogen-oxygen gas, i.e., *implosion*. Schauberger had noticed that vortices, which at times formed spontaneously on the seemingly still surfaces of lakes, appeared to be powered by some heretofore unknown source of energy.

Trombly also points out that it is important to note that the volume of gas, at its most efficient ratios, derived electrolytically from one volumetric unit of water is equal to 1,867 volumetric units of stoichiometric hydro-oxy gas. When detonation/implosion occurs, most if not all of the 1,867 units of the gas become one unit of water vapour in less than a millisecond.<sup>3</sup> This is nearly perfect recombination and is an *endothermic* process, not an exothermic, wasteful, thermo-percussive process as utilised by internal combustion engines.

Schauberger, during the Second World War, did create an "implosion generator", and the authors were able to visit his home and see some of his models. He rotated a cone-shaped spiral tube in a vacuum system and incorporated a special "virginised water" which he kept at exactly 4°C (39.2°F), which he claimed allowed for the implosion system.

Trombly also studied the Schauberger system and believes that what Schauberger observed was a hydro-oxy gas derived via the electromagnetic potentiation inherent in the fluidic electro-dynamics of the vortices which caused disassociation (expansion) or recombination (contraction) of the constituent water molecules, and that this process drives the phenomenon. According to Trombly:

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"He [Yull Brown] spent many hours telling me his stories in 1986. The technological punch line of this long debriefing was that Yull Brown had stumbled into implosion phenomena regarding stoichiometric hydro-oxy gas as the result of experiments conducted with gas derived from the fairly primitive electrolytic cell he had developed for his famous hydro-oxy welding torch, which utilised the amazing thermal characteristics of the hydro-oxy flame to weld, braze and cut metals.

"One day Yull, having heard about Schauburger's implosion generator, decided to do an experiment to determine whether the gas he was generating would explode or implode when ignited. He created a steel cylinder with a 15-mm wall to contain the explosion of a small volume of gas. He placed a custom high-voltage Tesla-type spark plug at the top of the cylinder. He filled the cylinder with water, which he displaced with an overpressure of hydro-oxy gas through a transparent plastic tube into a lucite cylinder at the other end. Once the gas was displaced, he ignited the spark plug and the water was sucked into the steel cylinder by virtue of the *implosion* created." (Trombly, 2014)

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Adam Trombly personally conducted this same experiment hundreds of times, always with the same results. He took this to mean that we could develop a highly efficient motor that would create zero pollution. More efficient HHO electrolyzers have been created, but, according to Trombly, the implications of Brown's work in the development of efficient motor technologies were astonishing enough for the president of a major oil company to say, after witnessing a demonstration: "This could be the end of oil!"

### The Technology

Although there is little or no question about the benefits of hydrogen in welding, there is extreme controversy when it comes to using hydrogen in automobiles. George Wiseman of Eagle Research in Oroville, Washington, claims that his HyZor electrolyzers produce Brown's gas. Yet, for Wiseman, it is not the hydrogen that is the fuel, but what he calls ExW (electrically expanded water) which occurs with HHO.

To understand what ExW is, it would be best to discuss further the work of inventor Stanley Meyer, who claimed to be able to run his car on water (Meyer died from food poisoning in 1998). It began with replacing some of the car's spark plugs with Meyer's special "injectors" which were "electrified to a specific resonant frequency".

Basically it was an on-board hydrogen fuel cell that would split water into hydrogen and oxygen gas, which would ignite under pressure with the help of a laser and RF electricity which excited the hydrogen gas.<sup>4</sup>

The H and O gases created on demand from the electrolyser were together injected directly into the air intake of the engine. Meyer replaced the technology in his Volkswagen dune buggy and ran the engine on nothing more than HHO gas from water.

Of more contemporary interest is the work of Ryushin Omasa, president of Japan Techno Co., Ltd, based in Tokyo, which we were introduced to by the famous water geometry expert Dr Masaru Emoto. Dr Emoto recommended this technology, which was patented in Japan in 2009 (in Japanese) [<http://tinyurl.com/jvwuoft>] (Emoto, 2011). We were able to organise for one of our Academy's scientific associates, Mattia Ghielmini, to meet Ryushin Omasa to discuss the technology. In the eyes of



Dr Desiree Hurtak and Dr J. J. Hurtak photographed with inventor Christoph Beiser.

most researchers, "Ohmasa gas" is at least a form of Brown's gas, most likely with both diatomic and monatomic forms of H and O. Like Wiseman with his ExW concept, Omasa vibrationally creates small bubbles of hydrogen and oxygen gas by stirring the water with frequencies in the 100 Hz range (which may be similar to Meyer's RF frequency). He claims to have been able to store the gas over long periods of time, and he has demonstrated how both a motorcycle and a car can run completely on his gas, although he has not devised an onboard process to generate the gas. (Omasa, 2011)

John Kanzius (1944–2009) also created an offshoot of Brown's gas in 2003 when he discovered a way to burn salt water. In fact, for many of these systems, *any* water will work, including non-potable water. Many people saw the CBS 60 Minutes news report which stated that while Kanzius was looking for a cure for cancer by testing various RF energy frequencies, he found a way to burn water. What he had discovered, many researchers believe, was a way of disassociating water into HHO using radio frequencies, just like Meyer and Omasa before him. It may not even be the same frequency, but nonetheless the agitation of the water molecules excited the water sufficiently to ignite it.

While some inventors use HHO gas as their sole source of fuel, the majority use it as a fuel supplement. In fact, systems are being sold all over the world using HHO as a booster system to gasoline. It is a simple concept where HHO is fed into the system through an on-demand electrolysis. This can be steady or pulsed, but it generates hydrogen-oxygen gas on board the vehicle. The HHO then is fed into the air intake to augment the combustion process of the engine. Only a very small amount of the HHO gas is needed, as it is fed

right into the regular gas (i.e., gasoline, diesel or biofuel), making it burn higher and more efficiently. Consequently, the mileage "booster" is the most popular use for HHO automobile systems today, apart from in welding. The technology is often sold in kit form or is developed by engineers and would-be inventors at home. It does not require a lot of electricity for the onboard electrolysis. Reports are that for a 12-volt battery, the electrolysis process requires about 20 amps. However, when you double the batteries to 24 volts, the process uses 40–50 amps but produces more than double the gas.

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One such system is the Empire Hydrogen Fuel Enhancement System™ (EHFES) where "hydrogen is generated on demand", that is, produced only when the engine is running. According to Sven Tjelta, chairman of Empire Hydrogen Energy Systems Inc.: "It is not stored or compressed on the vehicle and it is not used as a fuel. When introduced into the engine's air intake, the hydrogen acts as a catalyst,

dramatically improving the combustion of the vehicle's regular fuel in the engine cylinders." He cites his results in the chart below.

The famous magazine *Popular Mechanics* did a story on the hydrogen booster kits and came to the conclusion, with the help of researcher Fran Giroux, that the hydrogen or HHO energy in the fuel can allow the engine to run more leanly. The problem is that less pollution in the exhaust equates to more oxygen content. This higher oxygen content is detected in newer cars by the electronic sensor which senses the exhaust stream. In trying to compensate for the increase of oxygen, the programming within the ECU (engine control unit) tries to correct what it sees as a faultily tuned air-fuel ratio (AFR). The computer thus adds more fuel until the

Vehicle	Average Fuel Consumption		Improvement
	Baseline (mpg)	With EHFES	
2003 KW Cummins 15-Litre ISX	4.10	5.10	24.39%
1997 KW 3406E Caterpillar 14.6 Litre	4.01	4.82	20.20%
1997 KW Detroit 12.6 Litre	4.50	5.37	19.33%
2012 KW Cummins 15-Litre SX	5.29	6.11	15.50%
2011 Freightliner Detroit 15 Litre	4.50	5.50	22.22%
2004 Mazda RX8 (Rotary)	15.12	18.48	22.17%
2008 Ford F350 6.4-Litre Turbo Diesel	15.03	18.09	20.34%
2007 Dodge 5.9-Litre Cummins Turbo Diesel	16.00	19.85	24.10%
2000 Lincoln Navigator/5.4-Litre Gas	15.60	19.25	22.53%
2007 GMC W5500 5.4-Litre Diesel	11.44	13.29	16.19%

(Source: Report from Sven Tjelta, Empire Hydrogen Energy Systems Inc., on results with the EHFES, March 2014)

factory-set parameters for oxygen content are met, offsetting any fuel efficiency.<sup>5</sup> One may need to disable the engine's fuel detection management computer so that the lean fuel of 20:1 can be used instead of the normal 14.7:1. Some people have reportedly been willing to do just that, although the car will not pass inspection.

A new star on the horizon is the Austrian inventor Christoph Beiser, who wants to heat homes with HHO gas. This may sound dangerous but Beiser assures that it is not, as there are multiple safety features built into the system. First, there is the need to construct the system with metal (although the demonstration model is of acrylic). It is also important that the oxy-hydrogen be discharged into water to prevent a spark from igniting the mixture in the oxy-hydrogen generator.

Beiser was introduced to Brown's gas through the work of Swiss investigator and experimenter Peter Salocher. Together they succeeded in perfecting the classic square-shaped dry cell by experimenting with new designs. For example, higher efficiency was achieved by using only one hole in the plates for both gas venting and electrolyte equalisation (water level control). Most classical cells have two holes: one for the gas output; and one for electrolyte refilling, which produces significant current leakage at the second hole. In addition, a special passivation method using citric acid was applied for further optimised results.

Beiser alone carried out subsequent research and developments, also with the support of the Austrian-based group Gaia Energy. The aim was to develop an efficient and safe hydrogen dry cell for everyday use by the layperson. Beiser gave us a recap of his technology:

"Our current state of the art is a fully automated, computer-controlled dry cell. It fulfils any conceivable safety criteria such as pressure control, automated water refill, blowback detection, voltage control, and much more. Significantly increased efficiency was also achieved by using a much higher number of (spherical) plates as well as a special power pack. (Spherical-shaped plates increase operational reliability because of a much better sealing.) The cell is designed as a 220-volt cell. Given optimal conditions (considering all factors such as ambient temperature, etc.), such a cell requires only about 1.9–2.5 watts to produce 1 litre of gas per hour (W/L/h).

"Where we are now... Currently, successful applications are run in two primary areas:

"1) An all-automatic *heating system* (e.g., for a family home) based on the catalytic combustion of HHO gas. Here the hydrogen gas impinges on a catalytic exhaust converter and reacts with the platinum surface. The reaction produces very high temperatures that are conducted away by a special heat-dissipation procedure. There is no flame and no exhaust gas, which makes such a catalytic system most advantageous in terms of greenhouse emissions and even more so in terms of oxygen surplus. (It must be considered that 1 litre of fossil fuel requires 10 litres of oxygen for its combustion—a fact that is even more aggravating than its CO<sub>2</sub> emissions.)

"2) The dry cell for *optimising exhaust gas* values of marine heavy diesel oil (project carried out at an ocean carrier in Hamburg, Germany). Currently tests are run aimed at the reduction of millions of tonnes of pollutants from diesel combustion by injecting HHO gas into the intake air and thus optimising combustion."

Beiser's plans for the future are also aimed at a totally new method of Brown's gas production that will reduce the required power by a factor of five hundred. This technique would mean that only 0.05 watts is needed to generate 1.0 litre of HHO gas per hour.

### The Future

It would be great if we could run our cars or heat our houses on water, any kind of water. The big

problem has always been the cost of electrolysis. KleanGas is one company that is using an alternative solution. It is currently in the development phase of a system called PEAS (personal energy alternative solution) that unites solar with water, hence cutting the cost of electrolysis.

Yet, as important as power is to us, we need to be able to control our energy use as well, so that we can all live comfortably on planet Earth.

If we put these technologies together based on the fact that Brown's gas creates not an explosion but an implosion (where the reaction product has a smaller volume than the initial gas mixture), we arrive at another key use of HHO.

From the implosion, Brown's gas enables a

**From the implosion, Brown's gas enables a transmutation of atoms, which has been tested and seems to be able to decontaminate radioactive waste.**

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## The History and Future of Brown's Gas

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transmutation of atoms, which has been tested and seems to be able to decontaminate radioactive waste. This is an amazing find, especially for the crisis we are facing today in Fukushima.

A Brown's gas incinerator can reduce radioactive rays to 1/3 to 1/120 when it burns the trash from an atomic power generator (Oh, 1999). According to Dr Andrew Michrowski, chair of the Planetary Association for Clean Energy (PACE), Brown also did similar experiments in Australia and in the USA to determine if he could reduce radioactive particles; his initial experimental results showed a reduction of about 50 per cent.<sup>6</sup>

Michrowski and Poringa (2000) inform us that on 24 August 1991, China's Baotou's Nuclear Fuel Component Plant (No. 202) released a report entitled "The results of experiments to dispose of radiation materials by Brown's gas". The report

establishes that experimentation on a cobalt-60 radiation source decreased radiation by about 50 per cent. Michrowski and Poringa (2000) also quote from the research of Christopher Bird, who reported on a test conducted by Yull Brown before a public audience including US Congressman Berkley Bedell:

"Using a slice of radioactive Americium...Brown melted it together on a brick with small chunks of steel and Aluminum... After a couple of minutes under the flame, the molten metals sent up an instant flash in what Brown says is the reaction that destroys the radioactivity. Before the heating and mixing with the other metals, the Americium, made by the decay of an isotope of Plutonium, registered 16,000 counts per minute of radiation. Measured afterward by the [Geiger counter], the mass of metals read less than 100 counts per minute, about the same as

the background radiation in the laboratory where Brown was working." (Bird, 1992)

This experiment and others have shown that there can be a significant reduction of radiation, even more than in the 50–95 per cent range, in a short time period.

This is similar to the results that Omasa from Japan Techno Co., Ltd has recorded. Omasa's results were impressive enough that, in October 2013, Omasa submitted to Japanese officials a proposal to provide countermeasures to help neutralise the radiation at the Fukushima Daiichi Nuclear Power Plant. Japan Techno claims that its agitation process produces "nanobubbles" which cause nuclear transmutation. As a result, Omasa believes that he can reduce the amount of radioactive caesium and transmute it into non-radioactive material.

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## Conclusion

As we face the challenges of energy deficiency, we must remain forward thinking. Whether in the home or in the car, real-time production of HHO is being achieved. This paper, however, is not intended to encourage people to go out and make alterations to their cars. We are simply reporting on the state of the art of this invaluable technology which continues to grow around the world, generated from the work of Yull Brown who accomplished most of his research in Australia. As researchers with The Academy For Future Science, we are also excited about many new forms of technology, such as electromagnetic motors and zero-point energy (ZPE), but hydrogen, the most abundant element in the universe, may be the first step in our much-needed energy transformation.

In 1978, *Australasian Post* called Yull Brown "the most talked-about inventor in Australia today". There is a great potential that is still untapped. Now is the time to move the technology forward. This is happening not just in the garage of one inventor, but all over the world. New energy technology is viable and is now becoming available! ∞

## About the Authors:

J. J. Hurtak, PhD, PhD, and Desiree Hurtak, PhD, are founders of The Academy For Future Science (<http://www.futurescience.org>), an international non-governmental organisation that works to bring cooperation between science and consciousness.

Dr J. J. Hurtak is the author of numerous books including *The Book of Knowledge: The Keys of Enoch*® (<http://www.keysofenoch.org>) and *The End of Suffering*, co-written with his colleague, physicist Russell Targ (see review in NEXUS 14/03).

Dr Desiree Hurtak is a social scientist, environmentalist, filmmaker and author

whose work includes the preservation of environments and indigenous cultural heritage. Together, the Hurtaks have written several books including *The Overself Awakening* and have created inspirational music and films.

The Hurtaks have worked with hydrogen energy since the 1970s and were members of the International Association of Hydrogen Energy. They believe that hydrogen and HHO are great stepping-stones to take us away from fossil fuels.

The Drs Hurtaks' article "Propulsion of ET and High-Frequency Vehicles" was published in NEXUS 16/06 (October–November 2009). The Hurtaks are scheduled speakers at the 2014 NEXUS Conference in Queensland, Australia, on 2–4 August. They can be contacted by email at [affs@affs.org](mailto:affs@affs.org) and via <http://www.futurescience.org>.

## Endnotes

1. <http://tinyurl.com/lxvl4pm>
2. <http://tinyurl.com/mlqdmz2>
3. Brown's gas generators produce between 300 and 340 litres of Brown's gas per 1 kW/hr energy DC current approximately, and one litre of water produces about 1,866.6 litres of gas (Michrowski and Poringa, 2000).
4. "RF" stands for "radio frequency", but the term is often used to mean anything related to electromagnetic signals.
5. <http://tinyurl.com/3fx88o4>
6. Michrowski, Andrew, "Yull Brown's Gas", *Planetary Association for Clean Energy Newsletter* 1993 Jul; 6(4):10-11

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  - Eagle Research (George Wiseman), <http://www.eagle-research.com>
  - Empire Hydrogen (Sven Tjelta), <http://empirehydrogen.com>
  - Gaia Energy (Christoph Beiser), [office@ssb-info.com](mailto:office@ssb-info.com), <http://www.gaia-energy.org>
  - Japan Techno Co., Ltd (Ryushin Omasa), <http://tinyurl.com/k4xb7wz>
  - KleanGas (Bo Linton), <http://www.kleangas.com>