

HydroCoin (HYC)

providing clean energy for the blockchain era

www.hydrocoin.org

Whitepaper

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1. Executive Summary

Abstract: We design and create HydroCoin to be the currency for the hydrogen age. It will ensure that future clean technology will be used with clean fuel only, without the need for the use of fossil energy. HydroCoin will be the first currency that enables the owners to decide what technologies will be supported by the community. When products appear from such technologies (i.e. gas, hydrogen, electricity etc.) the owners of HydroCoin will be able to buy energy-products from all supported technologies using HydroCoin as a currency. So this currency and its market price will reflect the current development-phase of clean energy, and the availability of clean fuel.

For Technology providers the HydroCoin will be a way to become certified as a clean – future – technology by the community. Companies that are providing clean technologies can buy HydroCoin to collect votes, and participate in new clean technologies.

For Energy providers the acceptance of HydroCoin as a valid currency for their products will give benefit from the community as a clean-fuel provider that is certified by the community.

For Users the HydroCoin will be a valid currency for clean energy. Using this coin counts as a vote for clean energy. First products that can be purchased using HydroCoin will appear in the year 2020. The coin can be traded on many platforms. HydroCoin will use the ERC20 – technology and can be stored in almost every Ethereum-compatible wallet after the ICO-period is finished.

For the world, HydroCoin is a big chance to turn the traffic from combustion-engines using fossil fuel, to electric engines using clean fuel.

2. Introduction

The world is lagging behind the transformation of the transportation sector to more regenerative fuels to lower the emission of CO₂ and more or less toxical hydrocarbons. During the last few months cities in germany, china, california are dicussing the banishment of diesel cars from their centres. Countries like France and Great Britain are demanding the end of combustion engines by 2040. German green party claims the end of combustion engines until 2030 in current ongoing coalition talks.

We see that manufacturers are developing electric cars using batteries. The range of such electric vehicles (EV) is increasing, but the time to recharge batteries is limiting that technology. Fuel cell electric vehicles (FCEV) using hydrogen as fuel are already available for customers. FCEV are provding a long range in combination with short recharging time. This technology is available for mass-production, but the problem for further distribution is the missing infrastructure with gas-stations providing hydrogen.

In this situation governments like the german authorities agreed to support the building up of country-wide fuel-stations developing hydrogen. FCEV are clean without any emissions. The view on the vehicles only diverts the view on the sources of hydrogen. More than 95% of all produced hydrogen is currently made from fossil source. We are observing that oil- and gas-providing companies are starting to build up an infrastructure to provide fossil hydrogen from natural gas as fuel for FCEV. They say that there is not enough hydrogen from regenerative source available to supply all future FCEV. We believe that the combination of many different clean technologies to produce hydrogen can supply all future FCEV. The production of hydrogen from natural gas, oil and coal is emitting fossil carbon, like every combustion engine.

In the year 2015 almost all countries on planet earth signed the Paris agreement. Each country determines, plans and regularly reports its own contribution it should make in order to mitigate global warming.

HydroCoin is the solution to combine the rapid growth of crypto-currencies and the need to build up an infrastructure for clean-fuel without the use of fossil sources. Crypto-currencies are still in childhood phase, and blockchain technology provides a world of possibilities for practical applications that extend far beyond the financial sector.

HydroCoin is designed to become the world-wide currency for hydrogen as a clean fuel.

3. Market Overview

Current political situation in many countries forces the traffic-sector to change to cleaner vehicles. Combustion-engines are already reaching the maximum pollution-level, as the latest „Diesel-Gate“ - scandal indicated.

Electric vehicles (EV) using batteries are available for customers, and the range of some models is already comparable to cars with combustion engine.

But the long time to charge the batteries is still a limitation of this technology.

EV using fuel-cell technology with hydrogen as fuel are an alternative. In the last decade vehicles with fuel cell became more important. Public facilities like municipal services, transportation services, hospitals, fire alarms, and many more already started to change their fleet to fuel-cell based electric vehicles. Many of those public services announced to think about such a change within the next 5 years.

Hydrogen production in general is the family of industrial methods for generating hydrogen. Currently the dominant technology for direct production is steam reforming from hydrocarbons (i.e. natural gas).

As of 1999, the majority of hydrogen (circa 95%) is produced from fossil fuels by steam reforming or partial oxidation of methane and coal gasification with only a small quantity by other routes such as biomass gasification or electrolysis of water.

In 2014 around 8 GW of electrolysis capacity is installed worldwide, accounting for around 4% of global hydrogen production.

At the time of writing this whitepaper the only regenerative technologies to produce hydrogen as a fuel are biomass gasification and electrolysis of water.

Status of other methods to produce hydrogen.

- Biological production of hydrogen using algae is now economically feasible by surpassing the 7-10 percent energy efficiency (the conversion of sunlight into hydrogen) barrier with a hydrogen production rate of 10-12 ml per litre culture per hour.

- Photocatalytic water splitting

The conversion of solar energy to hydrogen by means of water splitting process is one of the most interesting ways to achieve clean and renewable energy systems. However, if this process is assisted by photocatalysts suspended directly in water instead of using

photovoltaic and an electrolytic system the reaction is in just one step, it can be made more efficient.

At the same time the market of crypto currencies has exceeded US \$200 bln. Thought leaders in the cryptocurrency field such as William Mougayar talk about “vanity metrics” – the breaking of records at each “Next Big” ICO launch that only seem important to those in the cryptocurrency industry. In this blockchain world, a big launch party is confused with as-yet-unproven success in the field. We are going to change this, while we are addressing a completely different community. The community members that we are going to address are

- manufacturers of clean hydrogen technology
- people that cannot wait to drive long distance without the use of fossil sources, and with short re-fuelling time
- investors from the blockchain-community
- startups with ideas for clean-energy

HydroCoin will be backed by a real world economy idea of hydrogen industry. Everybody, who see in his mind the big challenge the world energy industry is faced with, should accept, that hydrogen and fuel cell will be the one and only way, to solve worlds energy problem. Joining HydroCoin means participating the Hydrogen Industry worldwide. Even now, a lot of members of hydrogen community like energy producers and technology providers ask for HydroCoin to buy, to ensure to be a part of this new created symbiosis of clean energy and modern blockchain technology. Besides energy producers and technology providers some investment funds are asking for HydroCoin.

4. Strategy

Hydrogen as a clean fuel is used for vehicles with fuel-cell and electric drive. The current amount of available vehicles is very low. The technology for passenger cars is ready for mass-production. But manufacturers are still waiting for an infrastructure for hydrogen. As stated before, some oil-companies are already preparing an infrastructure of hydrogen-stations in many countries. This is a good development. Although the production from fossil natural gas is not what we like to see. Our strategy is to change this situation as soon as possible.

The most likely technology to produce enough regenerative hydrogen is the combination of electrolysis using wind- and solar-energy, and biomass-gasification.

Biomass-gasification is the technology that can be used world-wide with crop from farming. Especially the technology of Absorbtion Enhanced Reforming (AER) is our key technology. While actual systems for biomass gasification can only handle one dedicated sort of biomass, our technology-project „HydroGenial“ will develop a system that can handle different biomasses for input. That will be called a sensation. Dependence on just one sort of biomass with all related disadvantages can be eliminated. Everytime another source of biomass is available for input, the parameter of the system will be adjusted. This multibiomass capability represents the major enhancement of this technology. For the development work there will be cooperation with a research institute in southern Germany. Initial research results are already available. HydroCoin is used by the Hydrogen Future Foundation to support this development project. The proposed first construction will be a semi-mobile container-based solution, which will be sold to agricultural companies worldwide.

Straw, kernels, shells and wood can be used, to produce a synthetic-gas with more than 50% H_2 . Processing this synthetic gas will produce a high quality substitute natural gas (SNG), with more than 90% methane, good to use it as a clean fuel for first step. In the second step it will be possible to produce pure hydrogen for fuel-cells.

Two years after starting this first phase of development, the first gasification-units will be available for licensing to customers world wide. Every gasification-unit that starts producing SNG can be upgraded for H_2 -production.

This technology can be combined with almost every agricultural production worldwide.

An additional core strategy is to store produced hydrogen in a organic liquid without high pressure.

The challenge: Hydrogen is a gas with extremely low density and high storage densities are difficult to achieve. At ambient conditions it takes 11 cubic meter to store 1 kilogram of hydrogen. Conventional hydrogen storage only works under very high pressures (compressed hydrogen: 700+ bars) or very low temperatures (liquefied hydrogen: minus 253 °C). This generates additional risks and requires energy intensive compression and liquefaction procedures.

The solution: The safe and efficient storage of hydrogen in Liquid Organic Hydrogen Carriers (LOHC). LOHC can be stored and transported under ambient conditions in the existing fuel infrastructure without the need for high pressures or low temperatures. One cubic meter of LOHC can store more than 600 cubic meters of hydrogen gas.

This innovation is currently under development. HydroCoin will make this technology become available for trucks, ships and many other utility-vehicles world wide.

1000 litre of this liquid can carry 54 kg of hydrogen. This liquid acts like a battery, that can be loaded and unloaded. It is safe and can be used with conventional tanks and trucks for storage and transportation.

The combination of biomass-gasification as a future part of agricultural production, and liquid storage of hydrogen will change the world. The produced hydrogen can be handled as easy than gasoline or diesel today.

The most important fact is, that future energy-production will be decentralized. Every farmer worldwide will be able to produce hydrogen.

5. The Blockchain Case

Liquid Organic Hydrogen Carrier (LOHC) acts like a battery. This liquid battery can be loaded with hydrogen via hydrogenation. The state of the liquid battery is now loaded.

Loaded LOHC can be stored, carried to destination, and unloaded from hydrogen via dehydrogenation. Loaded LOHC must not be mixed with unloaded LOHC. The use of separate tanks for loaded and unloaded LOHC is mandatory. This limitation can be abandoned when using a tank with integrated moving barrier to separate loaded LOHC from unloaded LOHC.

The actual state-of-art for the hydrogenation / dehydrogenation is with container-sized systems. With such 1st generation technology the distribution of LOHC will be in closed environments only. We want to use this first generation technology to develop a blockchain-based management method for LOHC. We expect the next generation technology for hydrogenation / dehydrogenation to be of much smaller size. Then this technology can be integrated onboard of bigger utility vehicles like trains, ships etc. In this moment the distribution of LOHC will change from a closed environment to open environment. This will require a world-wide management of the LOHC.

The combination of HydroCoin and smart-metering-technology will enable such an open environment management for LOHC. Smart Metering devices will create an entry with information about the loading-level of LOHC delivered, as well as the amount of unloaded LOHC returned. When the transaction has been paid with HydroCoin as currency, the extended information is then placed onto the Blockchain.

This will help owners of HYC to prevent from paying a deposit fee for the amount of LOHC loaded on to the vehicle. This deposit fee is currently around 4,00 EUR for each litre of unloaded LOHC, and can summarize to several thousand EUR for bigger utility vehicles.

Following scenario will help to understand: A big utility vehicle will be fueled with 2000 litres of loaded LOHC. Around 108 kg of 2000 litres are hydrogen. A small amount of fueled liquid will be taken for purposes of precisely ratio measuring to get the exact amount of fueled hydrogen. Afterwards the data of this selling procedure will be registered at the blockchain. Through blockchain, firstly registered customers (vehicles) are enabled to pay automatically with HydroCoin exact amount of fueled hydrogen and secondly no deposit fee for LOHC is needed, because it will be tracked by the blockchain network.

6. Building an Infrastructure for HydroCoin

HydroCoin is designed to be a cryptocurrency that acts like a currency and a certificate for clean fuels. Beside all known advantages of blockchain-based token like trading, transactions without the need of a central bank, HydroCoin will give the owner the advantage to buy clean fuel at certified gas-stations. Gas-stations that are certified will accept HydroCoin (HYC) as the standard payment option. People can identify certified gas stations on our maps. The maps will appear on our website and upcoming app for smartphones. We will show the location of the gas station as well as information about operator, service and fuels.

Terms & Conditions for a certified gas station are 100% renewable fuels, from production to pump. Operators have to agree to accept HydroCoin as a currency when available. Fuels can be gas, hydrogen and electric power to recharge EV.

To speed up this building up of an infrastructure of certified gas-stations, HydroCoin will establish a new company to accelerate world's hydrogen initiatives. This company will provide only clean fuels like

- renewable Hydrogen ("clean Hydrogen")
- renewable Substitute Natural Gas (SNG)
- green electric power from renewable sources

The new gas-stations will have a unique and state-of-the-art design and setup. The roll-out of gas-stations will be combined with clean-technologies to produce such fuels from the pool of supported technologies by HydroCoin. The new gas-stations can also be combined with other sources of clean energy, like solar-power, wind-power etc.

The concept of this new kind of gas stations will be offered to operators world-wide through a franchise program.

Franchise-partners will have access to all new technologies that are supported by financial funding of the Hydrogen Future Foundation.




A first fully equipped demonstration gas-station will be ready for service by the year 2020. This gas-station will show all options for fuelling passenger cars (EV, FCEV, LNG, CNG), and also trucks and busses (FCEV, LNG, CNG).

To carry out these actions, HydroCoin member companies will play the following key roles: Technology providers that are already member of the board of Hydrogen Future Foundation will provide technologies in order to build up gas-stations. They will also providing information and know-how regarding the construction and operation of such new gas-stations.

7. HydroCoin - certificate for clean fuels

HydroCoin is designed to act as a certificate for clean fuels. This will give owners of a FCEV/EV and also CNG/LNG vehicles the information about the source of the fuel. We noticed that companies and organisations that are currently building up an infrastructure of hydrogen gas-stations / EV charging stations only focus on the vehicles to be clean. But in fact the source of those fuels mostly is from fossil carbon. HydroCoin wants to change this information quality while pointing out the clean providers.

Classification of HydroCoin Certificates

	GREY	H ₂ from electrolysis using electric power from the grid without green certificate
	GREEN	H ₂ from electrolysis using electric power from grid with green certificate, charging current with green certificate
	BLUE	Sustainable regenerative produced Biomethane / SNG, sustainable regenerative produced H ₂ , H ₂ from electrolysis using regenerative current from closed circuit, regenerative charging current from closed circuit

Providers of Biomethane / SNG, H₂ and charging current for EV can apply to become certified by HydroCoin. They will have to prove what energy source is used for offered fuels.

HydroCoin will check the application and eventually issue the matching certificate. HydroCoin will add the location of certified fuel-stations on a map, including information about operator, fuels and services.

The provider is allowed to use the HydroCoin certificate only in issued color for internal purposes. Also every certified provider has to sign an agreement to accept HydroCoin as a currency at all certified fuel-stations when this payment-option becomes available. New fuel stations from the new to be established company by HydroCoin will only offer fuels in the highest BLUE standard.

8. The HydroCoin Token

The name HydroCoin is a combination of hydrogen and coin.

We started our research for clean energy production with our project „HydroGenial“ in the year 2011. In fall 2015 we got in touch with Ethereum and the possibilities of Initial Coin Offerings.

The conjunction of both sectors - clean hydrogen production and blockchain - was followed by the creation of HydroCoin.

General Token Information

Token name:	HydroCoin
Token Symbol:	HYC
Token owner:	Hydrogen Future Foundation
Token Type:	ERC20
Decimals:	8
Total token issued:	The final number of token is 1 bln (1.000.000.000)
Token price during ICO:	1000 HYC = 1 ETH discounts during pre-order period
Accepted forms of payment:	ETH, BTC, EUR + USD after registration ETH from supported wallets without registration
Earliest trading date:	October 1st 2018

Additional information:

- No mining or other means of increasing the amount of token will apply to the HydroCoin token
- During the ICO, tokens will also be available with a discount structure as is publicized at the official HYC token site www.HydroCoin.org (The HYC token rate will depend on the time of purchase. Find more information about the ICO Road Map in chapter 9)
- Received funds from token sales will be predominately used for development of HydroCoin platform and team.

9. Community token advantages

HydroCoin, as a socially responsible project, has structured the token sale to comply with the regulatory requirements. The token sale will be structured as a reward based crowdfunding campaign, where contributors will receive HydroCoin tokens (HYC). HydroCoin has decided to include the community of contributors in a reward mechanism where HYC holders can get clean energy and whole community benefits. HydroCoin can be purchased for 0.001 ETH during the ongoing ICO. Every HydroCoin has the build-in right to be used to purchase clean energy - certified by itself. HydroCoin owners will be able to buy energy products at gas-stations with a discount. There will be more advantages like special loading devices that can only be used by HydroCoin owners. The starting price of HydroCoin is determined by the available green technology to produce clean fuel that is available to final customers. With the increase of technology to produce clean fuel the price of HydroCoin will raise, because more and more clean energy will become available for purchase with HydroCoin. As soon as possible the HYC will be listed for trading on major cryptocurrency exchanges. The price is expected to reflect more or less the clean fuel consumption, including hydrogen, produced with our self developed absorption enhanced reforming technology.

The proceeds from this ICO will be used to develop new technologies to produce clean fuel, but also for investment in available technologies like electrolysis of water with regenerative electric power from wind or solar energy.

10. Hydrogen Future Foundation

Hydrogen Future Foundation is the owner of this Initial Coin Offer. Switzerland is a key jurisdiction for philanthropy and shall be considered as an attractive option for philanthropists wishing to establish an international grant-making foundation. For that reason the founders of HydroCoin decided to create the foundation in Switzerland. The Hydrogen Future Foundation is a non-profit-foundation. The foundation pursues a public benefit purpose. The main purpose of the foundation is to enable a clean future with hydrogen from regenerative sources. For that purpose the foundation will support the development of technologies for clean hydrogen production with financial support, advisory and know-how. The foundation will also help to build up an infrastructure of clean fuel-providing stations.

The foundation board is the governing body of the foundation, and manages its activities and affairs. The foundation board is granted all rights and powers that are not expressly delegated to another body. It may delegate some of its powers to an executive director, committees and advisory boards.

Board members shall not, in general, be remunerated for their work, but can be reimbursed for their effective expenses. They may be remunerated only for mandates exceeding standard tasks of a board member.

The requirement to become a Member of the Board of Hydrogen Future Foundation is the purchase of 10 million HydroCoins.

There are also associated members of the board, without voting right.

Associated Members are invited to attend to the annual Board meeting and to public hearings.

The requirement to become an associate member of the board of Hydrogen Future Foundation is the purchase of 1 million HydroCoins.

To delimitate this purpose from the regular purchase of HydroCoin by individuals and companies, the offer to future Board Members will be handled separately.

11. Road map

Start of pre ICO	01.01.2018
End of pre ICO	31.03.2018
Start of ICO	01.04.2018
Start of Research and Development Absorption Enhanced Biomass Gasification	01.05.2018
End of ICO	30.09.2018
HYC will be placed on trading platforms Investment in technologies to produce clean hydrogen and sell it on gas-stations Investment in development of new technologies to produce clean fuel	After 01.10. 2018
First release of HYC mobile app	31.12.2018
first release of HYC NFC card	31.12.2018

12. Token distribution

Initial price of each token for the period beginning with the start of ICO until end of ICO is 0.001 ETH. In total 1 bln HYC will be offered in the marketplace. HYC is not mineable. In the period of presale buyers of HYC will get a discount of 10%.

Start of pre-ICO 50 Mio HYC with discount of 10% Price will be 0.0009 ETH	01.01.2018
End of pre ICO	31.03.2018
Start of ICO	01.04.2018
End of ICO	30.09.2018

Owner of the ICO, Hydrogen Future Foundation reserves the right to keep HYC, which are not demanded until the end of ICO. Roughly estimated distribution of HydroCoins can be as follows:

Token sale	50% of tokens (maximum 500 mln HYC)
Hydrogen Future Foundation	25% of tokens (maximum 250 mln HYC)
HydroCoin Community Growth	15% of tokens (maximum 150 mln HYC)
HydroCoin team	10% of tokens with 12 month lock up (maximum 100 mln HYC)

13. Our Team

HydroCoin is influencing the change of energy consumption, which requires a combination of energy, the blockchain, crowdfunding, market trading, independent energy supply knowledge and experience. HydroCoin combined its team looking at this mix of expertise needed to create the cleaner tomorrow.

Heiko A. Schumann

Co-Founder

Heiko is Co-Founder and responsible for Visions, Business Development, Communications and Human Resources.

Ekrem Ertuerk

Co-Founder

Ekrem is Co-Founder and responsible for Operations, Strategy, Financials and Marketing.

Charalampos Karakousis

Technical Advisor

Charalampos is Technical Advisor and responsible for Engineering, Projectmanagement and Research and Development.

Nathan Christian

ICO Advisor

Nathan is ICO Advisor and Consultant. He is responsible for Event Management and Brand Awareness.

Andy Gerhard

Webdeveloper

Andy is Webdeveloper and responsible for Online Services and International Advertising.

Antonios Katanas

IT Advisor

Antonios is IT Advisor and responsible for Social Media, Software.

Aris Fraggos

Financial Advisor

Aris is banking expert and financial advisor.

Prof. Dr. Ralf Kutsche, University Cologne

Advisor Information Quality

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14. Legal notice

Please read notices carefully:

The offer and sale of tokens is subject to review and regulation by governmental authorities in various jurisdictions, including without limitation the United States, Hong Kong, China, Singapore and Canada. Purchasers of tokens must be aware Hydrogen Foundation has not filed or submitted this whitepaper to, and the terms and conditions of the sale of the tokens have not been approved by, any such governmental authorities. Because of increasing scrutiny by such governmental authorities and the potential for enforcement proceeding against sellers of tokens or coins in 'Initial Coin Offerings', tokens purchasers need to understand that they may lose their tokens as a result of such enforcement actions. See 'Risk factors' in section 13 herein, for further information about risks related to purchasing hydrocoin tokens. The tokens described in this whitepaper involve risks.

15. Risk factors

A purchase of HydroCoin tokens involves a high degree of risk. You should consider carefully the risks described, together with all of the other information contained in this Whitepaper, before making a decision to purchase. Participation in token sales, including the HydroCoin token sale, involves a high degree of risk. Financial, operating, marketing and technology risks may be significant. Unexpected problems in the areas of product development, marketing, financing and general management, among others, that cannot be solved may arise.