



Fuel Cell Futures

Executive Summary

Fuel Cell Futures is a company that creates hydrogen energy systems that allow one to experience the perks of renewable energy with the ease and familiarity of a traditional energy system. Fuel Cell Futures will one day sell hydrogen cars and provide hydrogen refueling stations all across the United States, and perhaps, the world. We sell hydrogen fuel cell systems that allow a user to generate electricity completely off the grid, that's right, no more electricity bill. However, currently it takes forever to charge up batteries with the current renewable energy technology and batteries only last for a certain number of charges before they lose voltage completely. With hydrogen, you can easily fill your hydrogen tank in seconds just like the traditional gas power car, and you're off to the races.

I plan on targeting the new generation and their drive to take the energy market off fossil fuels and into a clean, renewable energy economy completely. I plan on reaching this generation by word of mouth along with setting up a few example locations where my products are used such as a golf course with hydrogen powered golf carts and a hydrogen energy system to power them all in the garage.

Once I create the infrastructure for hydrogen cars, my projected revenue is limitless. It would be like controlling 100% of the world's oil market right now, I would hold a lot of the world's energy sources in my hand. However, hydrogen is the most common element in the universe, so it can easily be replenished and made from common materials such as water.

Im hoping to raise \$5,000 to get myself started with my basic startup costs and purchases necessary to get this business off the ground floor.

Fuel Cell Futures L.L.C is run and managed by Andrew Thomas Clabaugh

Company Summary

Fuel Cell Futures is a Ohio-based L.L.C. hydrogen system supplier. Fuel Cell Futures offers its services to both the common consumer who would like to convert their home

to be fueled by renewable energy sources and companies who would like to provide renewable products for their customers.

Fuel Cell Future is in an emerging industry that has great potential only limited by the lack of infrastructure currently. This is where a completely independent reversible fuel cell system based off the grid can come in handy. With an electrolyzer inside the system, Fuel Cell Futures can create its own hydrogen with its fuel cell system designs.

I hope to utilize my access to friends I have currently going into multiple different fields that could benefit the company. I would coordinate all my tax information and financial information to an accountant which would help me get some good tax deductions. Coworkers will first be made up of kids who would like to be engineers in the future from my local high school but don't know which field to go into. I have all types of engineering such as chemical engineering, electrical engineering, and mechanical engineering. The suppliers are all from online sources either local or foreign. As far as the customers go, I plan on starting local and working out towards the bigger cities in Ohio such as Mansfield, Akron, and Columbus.

“We will provide the next generation of renewable energy for everyone's benefit”

My short term goals are to complete all three of my books that include all of my designs and ideas. I also hope to complete a basic fuel cell system next summer and hire my first employee to help me out on those projects. Long term wise I hope to have my own house where I work out of my basement so I can get juicy tax deductions to allow me to develop my first product. I also hope to attend invention fairs where I can attract customers from longer distances away.

Market Analysis

Right now there are many people emerging who want to be a part of change when it comes to making the switch to renewable energy. Talks of global warming have definitely had an impact on today's generation, which I hope to primarily target. People like Elon Musk with his big corporations have a bad wrap, but a local business from Mid-Ohio is the perfect underdog story people want to hear and be a part of.

The global hydrogen generation market size was valued at USD 130 billion in 2020 and projected to reach USD 201 billion by 2025, growing at a CAGR of 9.2% from the forecast period.

Strengths • Engineering Student • Plenty of Research in the topic • Drive • Leadership experience from being an Eagle Scout	Weaknesses • Lack of knowledge on government safety specifications for hydrogen equipment
Opportunities • Government grants • Tax breaks for the self employed • No market leader in category	Threats • Buyout • Hydrogen disaster

I plan on using a differentiation competitive strategy in the face of competition. When it comes to the renewable energy market, you have electric cars and homes. But electric cars need to be charged, and the batteries only last so long before they lose their voltage and you cannot recharge them anymore. This is where hydrogen comes in. It refuels as fast as a gas car, and it lasts much longer than a battery powered electric vehicle because the fuel cell does not wear nor does it lose voltage overtime.

Management and Organization Outline

Fuel Cell Futures L.L.C will be solely run by Andrew Clabaugh with no management team at this point in time. Andrew Clabaugh is the only Employee at Fuel Cell Futures L.L.C and he is responsible for production, management, communication with supplies, communication with customers, and customer service.

Products and Services

Fuel Cell System - The basic fuel cell system will include an electrolyzer, two bubblers, adequate tubing, a regulator, gas storage, and the fuel cell stack itself. The sizes of each of these items are dependent on the customer in question. These fuel cell systems will help fuel my futures products listed below

Hydrogen Golf Cart - This golf cart will feature a hybrid fuel cell design with regenerative braking to achieve maximum efficiency. These golf carts will park in a common garage

and will be refueled by my basic stationary fuel cell system. This will allow me to gain knowledge of hydrogen energy on wheels before my next project and product listed below.

Hydrogen Car - The Fuel Cell Futures car will be the peak of the company and will require a lot of research and funding. The common problem with hydrogen cars when they first released was that there was no infrastructure for them (three stations in California that cost 16\$ per "gallon" of hydrogen). With my company, by the time I get to making cars, people will already or could purchase a fuel cell system for their home that will allow their own home to generate hydrogen off the grid for their Fuel Cell Futures products.

Target Market

My ideal customer would be somebody who lives close to the business, so Mid-Ohio. That would allow for ease of installation, and if problems occur, ease of repair distance. The age range for this particular market does not have that big of an impact on my product research; however, it would be nice for the user to know how to use the technology installed. My product does not require a specific level of education to operate because it is not user operated. Some common behavior patterns preferably would be somebody who wants to see the change in the current US energy market, or even on the world stage. This includes people who spend their free time lobbying / protesting for a renewable energy economy. Ideally, they would also already have some renewable energy technology such as solar panels or even an electric car. My product will only be affordable by the mid-middle class and up; however, I hope to integrate to the lower classes using surplus.

Marketing Plan

I hope to keep my golf cart product competitive with the price of a brand new golf cart that is all electric which is around \$10,000. This will allow my product to stand out because not only is it a golf cart, but the whole system can be off the grid. As far as the system itself, I hope to keep the cost under \$2,500 for a full installation. I hope to use all of my friends who golf and work at golf driving ranges to talk a bit with upper management to strike my first deal. From there I can use the hydrogen system in use from that location as an example to representatives from other companies so they can see the product in action.

To raise money for my startup fees I plan on designing and selling merchandise that carries the company logo because I got a few requests from people that they would be willing to buy some merchandise if I sold some. I know I could get my startup costs covered by going through with this decision and get my name out there with people wearing the company name in public.

Logistics and Operations Plan

McMaster-Carr will supply all of the basic hardware I will need to create my bubblers, electrolyzers, fuel cell endplates, tubing, basic metal framework, and experimental test station materials. They were my top choice because they are located in Ohio and have really fast delivery times.

Fuel Cell Store will supply all of my MEA platinum and membrane films needed for my fuel cell stack. They will also carry all of the chemicals I need to produce the PEM myself in store. They are a small company based out of Texas selling chemicals for hydrogen systems since 1999.

Ohio Carbon Black is my choice provider for my graphite needs. If I need hard graphite, they've got it. If I need soft graphite, they've also got it. They were an easy choice for me due to their location also being in Ohio.

All of my products I will make and install in a two week time period. Once I know what I need for a specific customer, I can easily create a fuel cell system for their needs because the whole process is pretty much cookie cutter once you do your first one. I will try to keep some common materials on hand to help myself out when it comes to seasons where supply might get low or if I get overloaded. This will allow me to take my focus on babysitting supplies and spending all my time on production and customer service and satisfaction.

All production from Fuel Cell Futures L.L.C will happen in my basement. Once I register and become self-employed this will allow me to deduct the percentage of the house I work in off my internet bill, phone bill, property taxes, and I will get a \$5,000 credit to upgrade my home office from the IRS.

I will use my current computer I built because it has plenty of power to run any software needed to design fuel cell systems. I will also need equipment for a light tight room and yellow bug lights, a drill press, a band saw, and a 3d printer with adequate filament. That will allow me to operate at maximum efficiency. Like previously mentioned, these

costs can be covered possibly by selling merchandise with my brand name on it such as shirts or hats.

I will have to personally go to the customer's location in order to fulfill the order and install it to their satisfaction.

As far as inventory goes, I'll keep the commonly used parts on hand. I do not want to keep a lot of extra inventory because I will have to pay taxes on it even when I'm not using it and it's sitting on a shelf for months on end. I plan on using the "recurring order" feature on Fuel Cell Store's website so I can schedule when I need parts. This way I can keep parts sitting on shelves for months to a minimum.