The future is now

Let's invest in God's amazing particle.

CGH POWER

- Apple is investing in it.
- Samsung has more than 200 patents in graphene.
- This powerful material is 200 times stronger than steel and 100 times stronger than diamonds.
- The graphene market is about to triple.
- Graphene has an unlimited potential.

Telephones of the future

High Surface-Area Graphite Extracted From Biomass

RADIO FREQUENCY POWER DELIVERY SYSTEM FOR TRANSFOMING BIO-ORGANICS INTO EXTRACTED CARBON MASS RESIDUALS

GRAPHENE: THE CARBON-BASED 'WONDER' MATERIAL

Since its discovery in 2003, graphene has been a hot topic in chemistry and material science research. It has been linked with water purification, electronics, and biomedical applications. However, how close are we really to using graphene in our day-to-day lives? This graphic looks at its properties, uses, and its future.

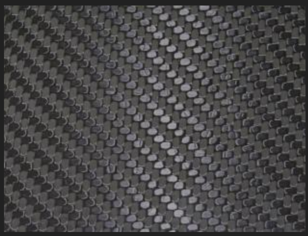
WHAT IS GRAPHENE?

Graphene is a single layer of graphite, the carbon-based material found in pencil leads. Graphite has been known for centuries, but graphene was only isolated in 2003, by shearing layers off of graphite using sellotape. Its a single atom-thick layer of carbon atoms, that are arranged in a flat, hexagonal lattice structure.

Single layer of carbon atoms
Honeycomb like structure
Graphite is layers of graphene
Isolated in 2003 in Manchester

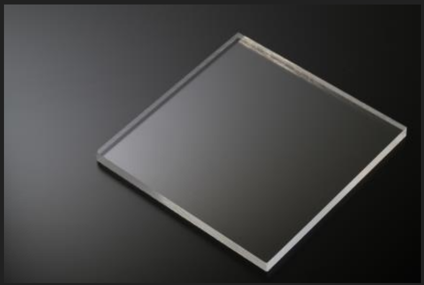
Potential Uses Of Graphene

- Touchscreen in devices
- Water filtration system
- Electric devices
- Medical sensors and drug delivery
- Energy storage and composites



The properties of graphene

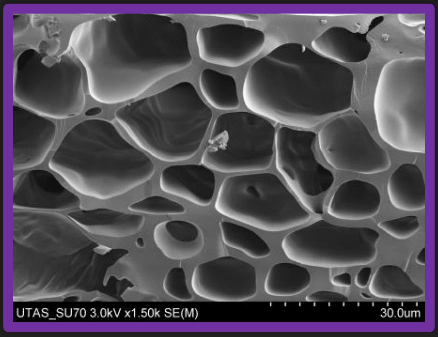
- High electrical conductivity
- 200 times stronger than steel
- Thin and lightweight
- Hight thermal conductivity
- Very high transparency

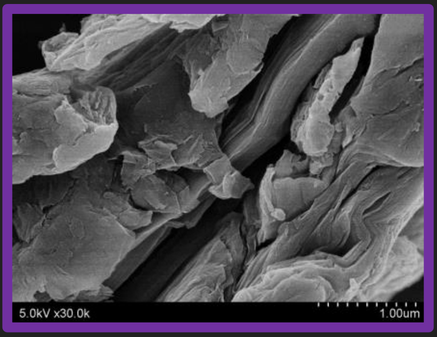


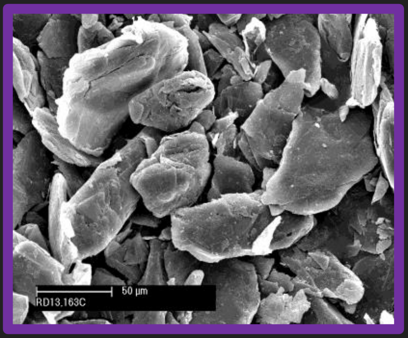
Graphite Biomass Extraction Process

- Mechanical Separation
- (Chipping and Grinding)
- Liquid Separation
- (Boiling)
- Graphite Refining (Baking 2,000°C)

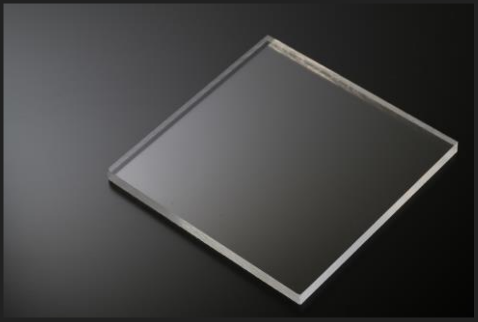
Biomass Extracted Graphite
vs.
Natural Graphite

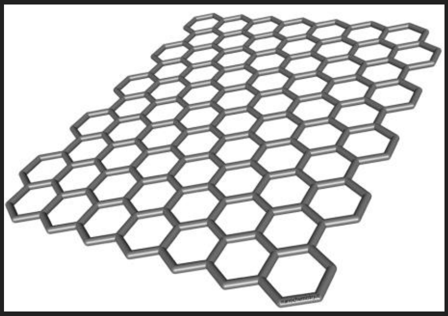






Biomass Extracted Graphite	Natural Lump/ Flake Graphite	Natural Amorphous Graphite
97-99% - Carbon Content	94-97% - Carbon Content	70-85% - Carbon Content
BET surface area - 300-900 m2/g	BET surface area - 6-10 m2/g	BET surface area - 1-3 m2/g

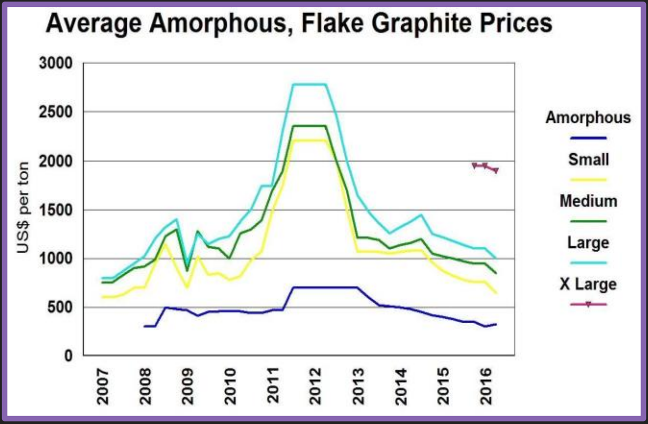




Comparison of Biomass Derived Graphite and Natural Graphite Mining Production Costs (1 metric ton)

Biomass Derived Graphite (97-99% C)	
Waste Disposal	$205.71
Electricity	$150.15
Liquid Fertilizer	$102.86
Labor	($158.74)
Total Production Costs	**$299.98**

Amorphous and Flake Graphite Mining (94-97% C)	
Mining & Refining	($412.12 - 1,010.50)
Total Production Costs	**($412.12 - 1,010.50)**



Additional Value from Biomass Derived Process:
Waste Disposal Benefits

- Organic Waste Recycling
  Environmental Benefits
- Renewable Energy
  Co Products
- Liquid Fertilizer Benefits
  Increase BET Surface Area

Start-Up Cost (Capital Expenditure) for World's Largest Graphite Mines

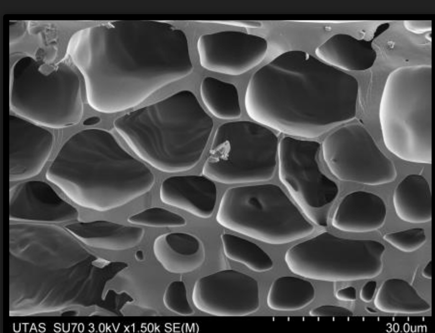
Capital Expenditure		Graphite Production (tons per year)	Capital Expenditure / Annual tons of Production
CGH Power,Inc	**$2,240,000**	**14,000**	**$160**
Northern	$81,600,000	23,690	$3,444
Focus	$132,480,000	44,300	$2,991
Mason	$103,760,000	50,000	$2,075
Energizer	$188,000,000	53,017	$3,546
Syrah	$138,000,000	356,000	$388
Flinders	$16,700,000	16,600	$1,006
Valence	$29,360,000	25,000	$1,174
Magnis	$171,400,000	200,000	$857
Kilbaran	$56,000,000	40,000	$1,400
Triton	$110,000,000	210,000	$524
Zenyatta	$411,000,000	30,000	$13,700
TOTAL WORLD PRODUCTION of Natural Graphite		1,200,000	

	Capital Expenditure	Annual Revenue	Annual Profit	1 Year ROI
CGH Power, Inc	**$2,240,000**	**$20,422,400**	**$17,200,000**	**668%**

Overall Benefits of Biomass Derived Graphite Production

- **Waste Disposal Benefits**
- **Environmental Benefits**
  - Renewable Energy
- **Co Products**
  - Liquid Fertilizer
  - Electricity
- **Increase BET Surface Area**
- **Lower Cost of Production**
- **Lower Capital Investment Cost**
- **New Domestic Source of Graphite Production**

Biomass Derived Graphite
BET Surface Area
186-320 m²/g
Carbon Content
97-99%



Wood Feedstock
(72,000 tons)
$2,880,000

Production Costs
($2,222,400)

Graphite
(14,000 tons)

Electricity
(26,280 mwah)

Liquid Fertilizer
(1,000,000 gals)

Annual Production Capacity

	Capital Expenditure	Annual Revenue	Annual Profit	1 Year ROI
	$5,240,000	$20,422,400	$17,200,000	668%

Clean Green Hydrogen Power, INC. Designed in Kentucky with Thermax.

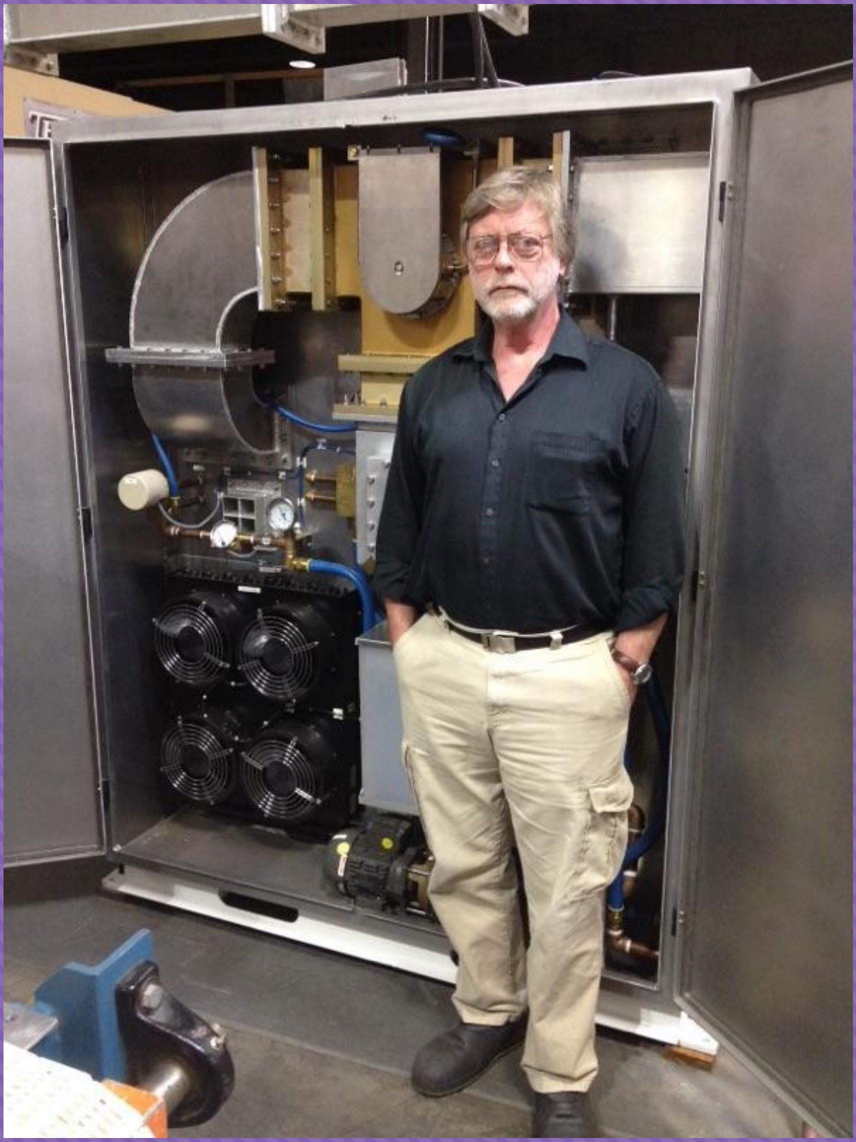


Photo with Clean Green Hydrogen Power Engineer Kirkwood Rough

Clean Green Hydrogen Power Executive Summary

Municipal Solid Waste Problem

Around 70.6 million tons of urban wood waste was generated in the U.S. in 2010, including 48 percent from municipal solid waste and 52 percent from construction and demolition (C&D). Several years ago, the Construction Materials Recycling Association estimated a further 29 million tons of waste per year.

Let's Revolutionize Our Soil Waste Into Valuable Products

Jim Piazzo is the Chief Executive Officer of Clean Green Hydrogen Power, Inc., with his help, his engineering team developed patented equipment which will be added to a thermal microwave. The use of this CGHP equipment will reduce the current solid waste problem and will turn it into a positive product for our planet, and our children's future. This current technology developed by CGHP has a 97% efficient rate which is significantly more efficient than solar power (only 20% efficient).

Mr. Piazzo's design is ready to produce the much-needed organic materials such as bio-fuels, biochar, carbon, graphene, and best of all, this specialized equipment can produce electricity on our current electrical grids removing our carbon foot in the process.

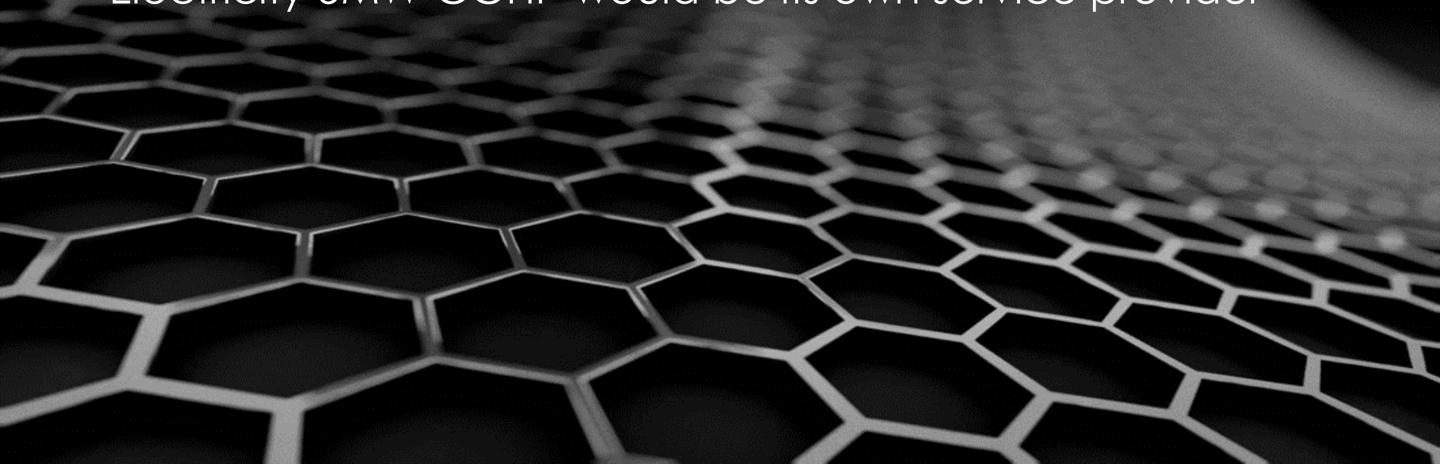
Clean Green Hydrogen Power Key Advantages

Efficiency is 97% using thermal microwaves.

- Tax fee money from cap and trade.
- Reduce our carbon footprint on the planet.
- Focusing on recycling waste from our transfer stations to remove the solid waste problem and expedite it into valuable materials.

Examples of Biomass Supply & Products

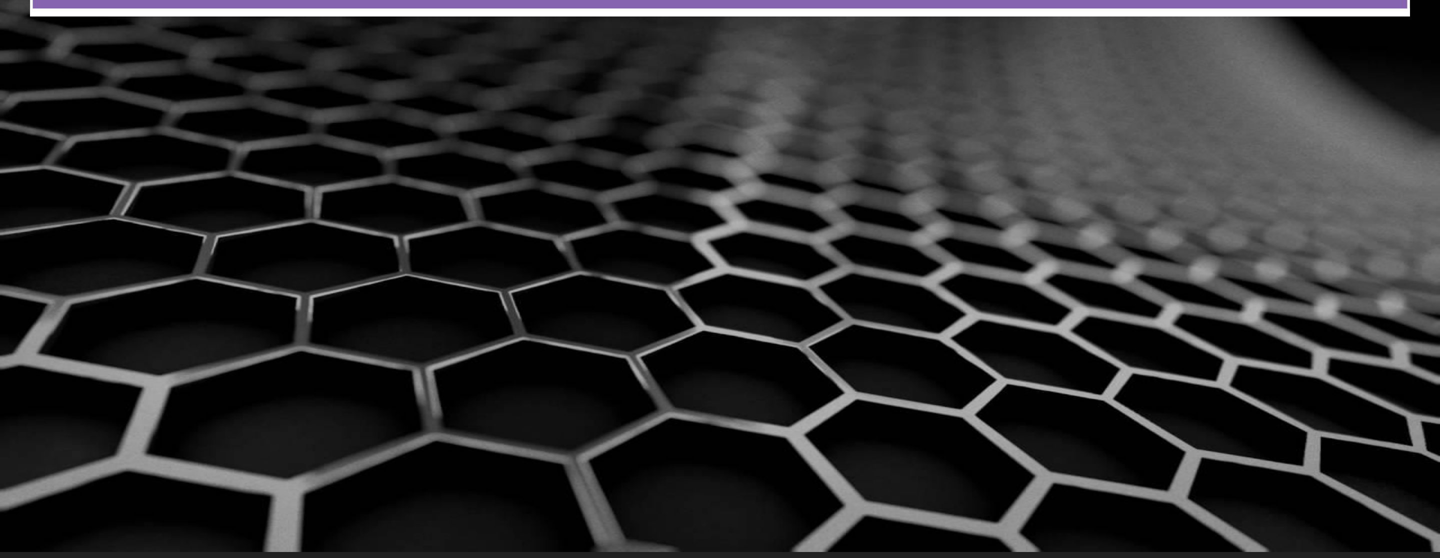
- Biochar has over 55 multiple uses including farming industry, construction industry and skin products.
- Liquid fertilizer, a completely organic-certified product.
- Activated carbon to remove impurities from water.
- Graphene with a higher surface area 186-320 m 2/g.
- Bio-Oil is currently used in San Francisco, California, to fuel Fleet ships in the Bay
- Electricity 5MW-CGHP would be its own service provider



Revenue Forecast Per Day

Note: only one product to be manufactured per day.

Products	25 tons=1 semitruck	Per day	Amount
Biochar	$645,000.00	8	5,160,000.00
Activated carbon	$297,500.00	1	$297,500.00
Bio oil	$31,500.00	1	$31,500.00
Graphene	$50,000,000.00	1	$50,000,000.00
Electricity 5 MW	$30,000.00	1	$240,000.00
Cap & Trade Tax Free	$52,054.00	1	$52,054.00
			$107,783,000.00



Operational Plan and Team Structure

Operational Plan

Phase 1: Site Development
Phase 2: Construction, Installation & System Coordination
Phase 3: Legal Environment
Phase 4: Start Production

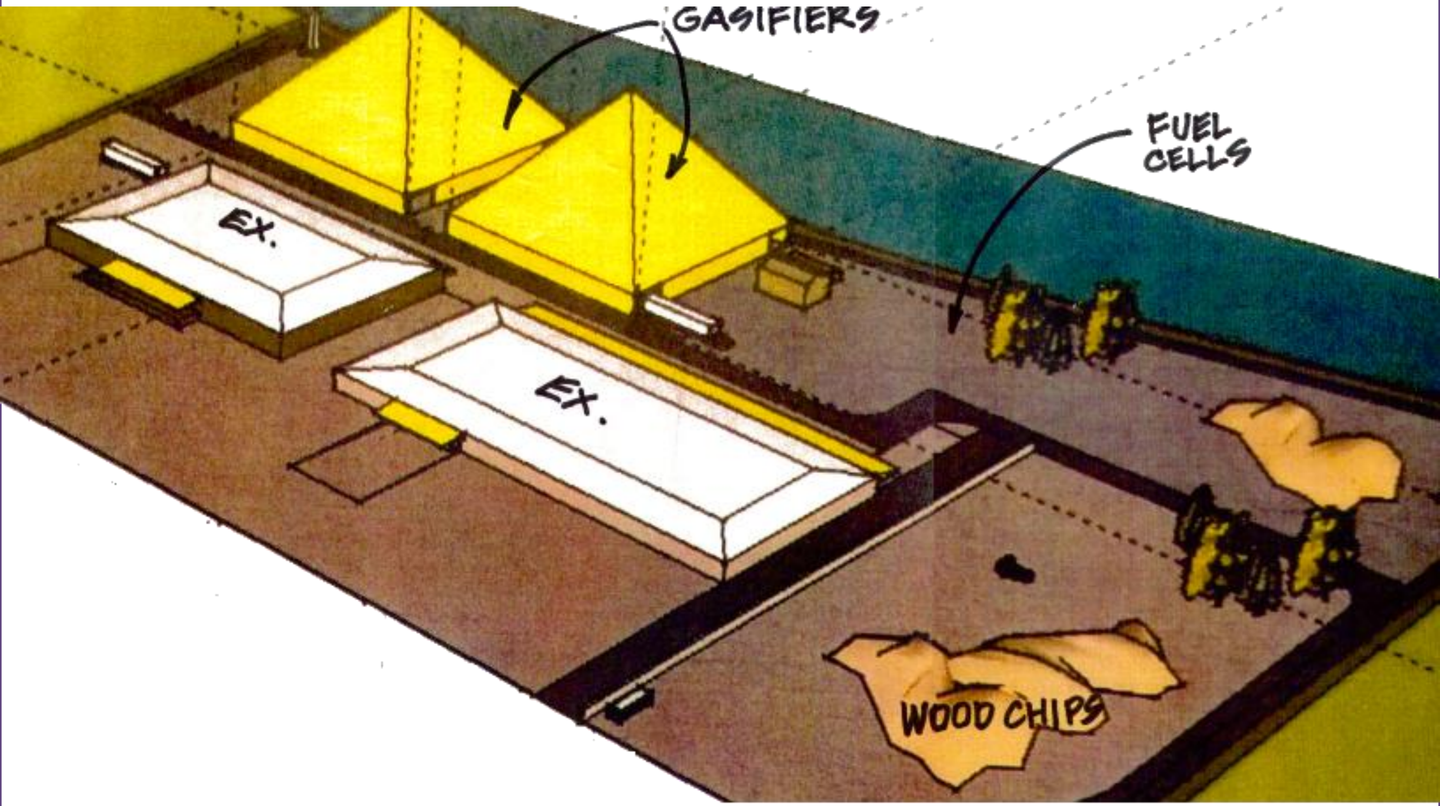
Organization

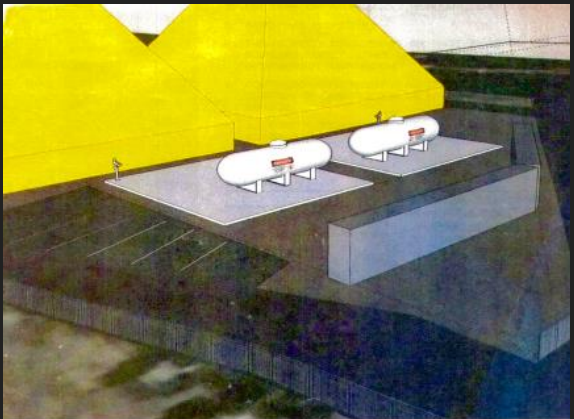
For the start-up period, the charter members meet at least once per month to discuss the current status and plan for 'next steps'. The Managing Member is the main point of contact for potential funders, suppliers, agencies, customers, etc.; but all developments are forwarded to all of the members for review, discussion, and decision making. During construction and installation work, the Managing Member will supervise and monitor all contracts with engineering and contractors. As the CGHP facility is being constructed, CGHP will hire an on-site manager for all operations, in addition to two experienced engineers to learn about the equipment and system as it is commissioned and integrated. Once fully operational, the CGHP facility should maintain twenty (20) full-time positions.

Board of charter members: general manager, business implementation, faculty deployment, business management, sales/marketing, operations, human resources and repair/maintenance.

CEO- Jim Piazzo
VP- Tony Hammon
Jason Brandt, Managing Partner
Kirkwood Rough, Engineer

Initial concept design by Clean Green Hydrogen Power, INC.





SYN-GAS STORAGE

The Power of Carbon

Nature uses CARBON to create all of the living organisms on this planet and the POWER used to sustain life. Plants naturaly convert carbon dioxide and water into stored energy. via photosynthesis. By reversing this process we are able to extract Carbon, water, and energy from plants and other living organisms. The process is natural and environmentallyfriendly. There are no added chemicals used in the process, and atmospheric Carbon (carbon dioxide and methane) is sequested, reducing our carbon footpriint and reversing global warming, all while preserving and enhancing biomass feedstock sources.

CGHPower is an American company, with products manfactured solely in the USA. We uphold the American standards of quality and integrity in our company and our products. We stand by all our products with a 100% lifetime money back guarantee. Our company is LEED certified, the highest environment quality rating for any business. Our team of employees are highly skilled, well-compensated, and highly motivated to become the greenest company on the planet.

Global energy demand and investment has climbed exponentially over the last half century. With the advent of renewable energy sources, demand for clean energy have never been higher. Meanwhile, advances in graphene research, in just the last decade, has provided millions of new products and has spurred a quickly growing, emerging graphene industry that is now grown to over 250 million USD annually. CGHPower's ability to utilize the newest and latest in technologies makes our company well-suited for continued growth and expansion late into the 21st century and beyond.

CGH
POWER

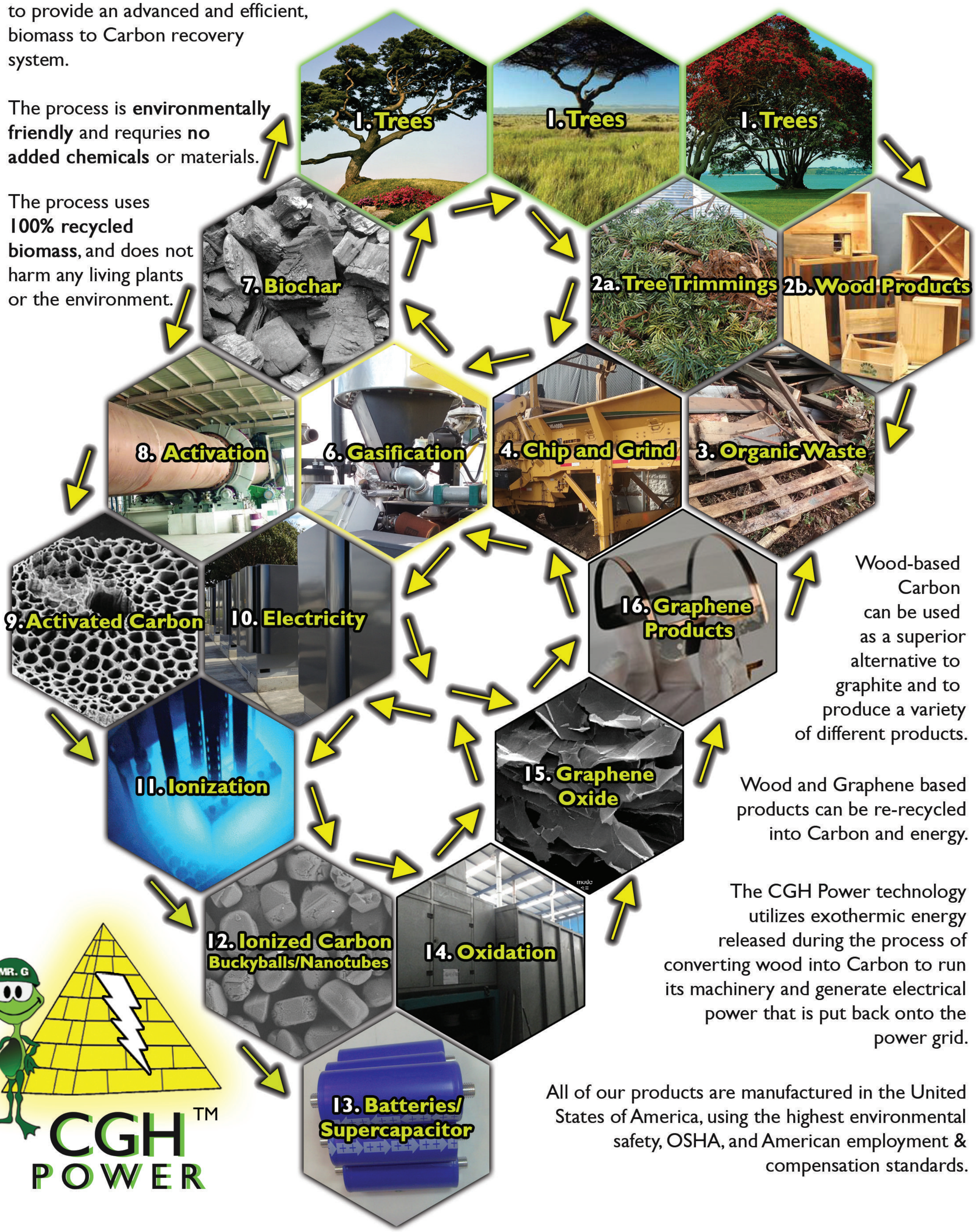
Contact us for more information, or to schedule a tour of our demonstration facility

The Clean Green Hydrogen Power Cycle

CGH Power utilizes the newest in green technology to provide an advanced and efficient, biomass to Carbon recovery system.

The process is **environmentally friendly** and requries **no added chemicals** or materials.

The process uses **100% recycled biomass**, and does not harm any living plants or the environment.



Wood-based Carbon can be used as a superior alternative to graphite and to produce a variety of different products.

Wood and Graphene based products can be re-recycled into Carbon and energy.

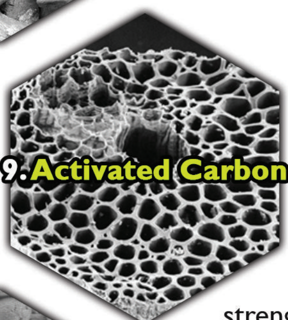
The CGH Power technology utilizes exothermic energy released during the process of converting wood into Carbon to run its machinery and generate electrical power that is put back onto the power grid.

All of our products are manufactured in the United States of America, using the highest environmental safety, OSHA, and American employment & compensation standards.

CGH POWER Carbon Series

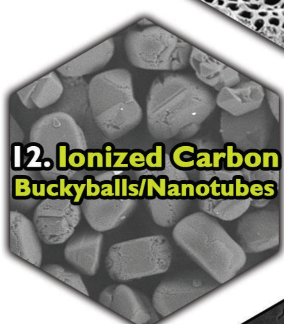
Biochar - can be used as fertilizer for plants. Made from organic plant matter, biochar is rich in plant nutrients, such as Phosphorus, Potassium, Calcium, Magnesium, and Nitrogen. Because of it's high Carbon content, biochar is not biodegradable like composts or manures. It's stability in soil allows for it to remain in there for hundreds of years.

Biochar interacts in the physical, chemical, and biological aspects of the plant-soil continuum. It'shigh porosity allows it to absorb and retain water, especially in drought-stressed conditions. It's high cation-exchange capacity allows it to absorb and retain nutrients. It's high surface area to volume ratio promotes living spaces that increase growth of beneficial soil microbes. It is found that 20% increase in soil Carbon can increase water holding capacity by 80%.

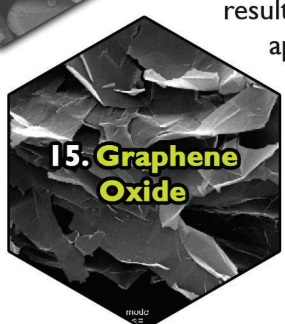


Activated Carbon - has the strongest physical adsorption forces, or the highest volume of adsorbing porosity, of any material known to mankind. Activated carbon has a surface area of 1000-2000m²/g. This means 1 gram of activated carbon can have the surface area of a football field.

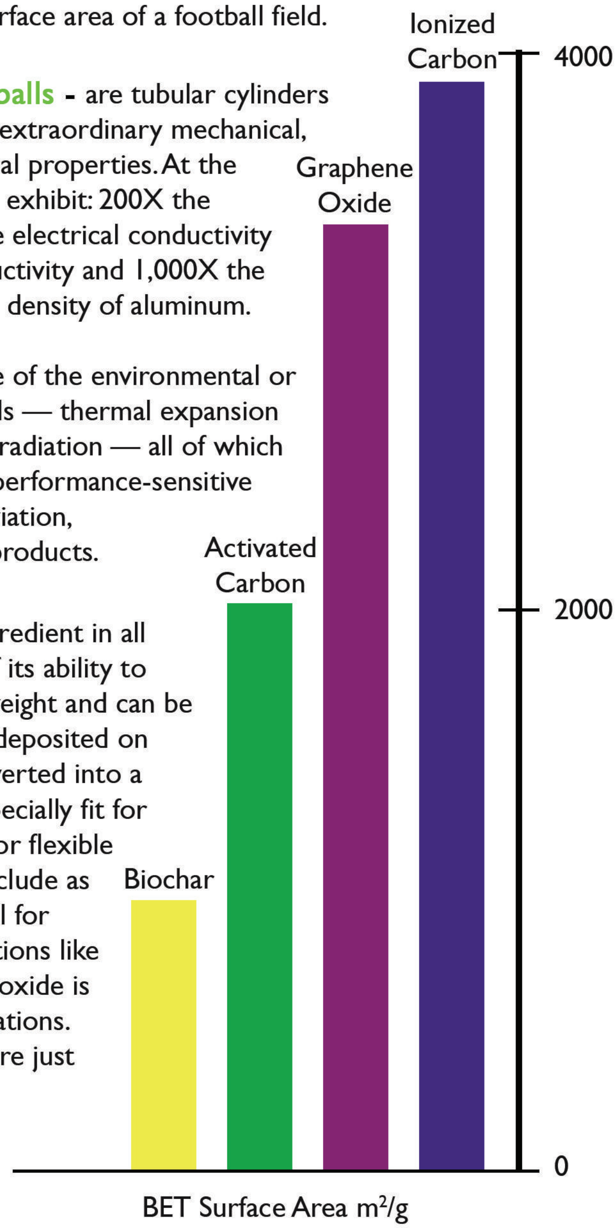
Carbon Nanotubes and Buckyballs - are tubular cylinders spheres of carbon atoms that have extraordinary mechanical, electrical, thermal, optical and chemical properties. At the individual level, these unique structures exhibit: 200X the strength and 5X the elasticity of steel; 5X the electrical conductivity ("ballistic transport"), 15X the thermal conductivity and 1,000X the current capacity of copper; at almost half the density of aluminum.



Carbon Nanotubes and Buckyballs have none of the environmental or physical degradation issues common to metals — thermal expansion and contraction, corrosion and sensitivity to radiation — all of which result in greater system failure resistance in performance-sensitive applications in aerospace and defense, aviation, automotive, energy and consumer products.

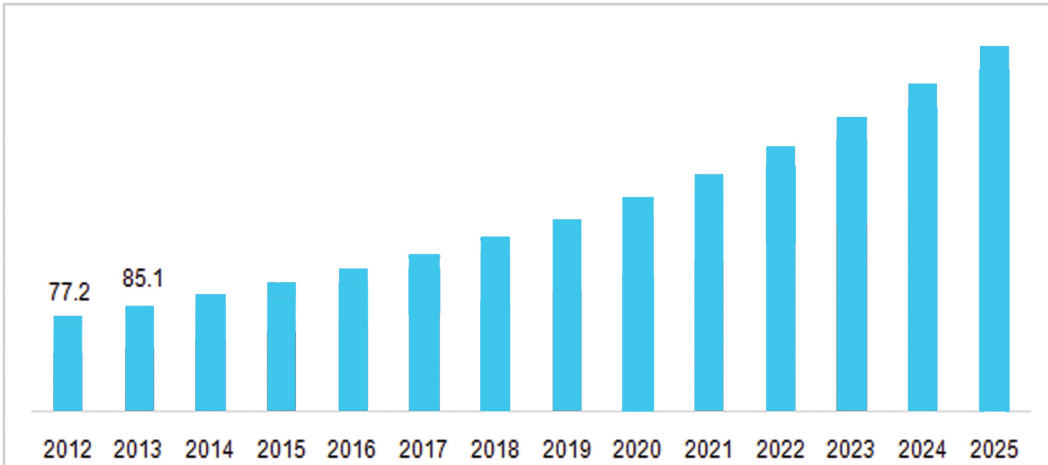


Graphene Oxide - is the main ingredient in all Graphene based products because of its ability to provide extreme strength and light weight and can be molded to form any shape. It can be deposited on essentially any substrate, and later converted into a conductor. This is why graphene oxide is especially fit for use in the production of transparent conductive films, like the ones used for flexible electronics, solar cells, chemical sensors. Other uses for Graphene Oxide include as a tin-oxide replacement in batteries and touch screens, as electrode material for batteries, capacitors and solar cells. Graphene oxide can be used for applications like hydrogen storage, ion conductors and nanofiltration membranes. Graphene oxide is fluorescent, which makes it especially appropriate for various medical applications. bio-sensing and disease detection, drug-carriers and antibacterial materials are just some of the possibilities graphene oxide holds for the biomedical field.



BIOCHAR MARKET Report

Lawn and garden customers would welcome the chance to discover and purchase local and organic biochar product. A quick web search will reveal that many amateur and professional gardeners are excited about the promise of organic biochar to help produce flourishing gardens while saving water, energy, and reducing conventional fertilizer use. Biochar can do all of these things according to Green Facts, Facts on Health and the Environment, https://www.greenfacts.org/en/biochar/index.htm. Biochar is even mentioned in numerous TEDx talks as revolutionary https://www.youtube.com/watch?v=AKBkgJoalxQ. Benefits include reduced water usage, more productive gardens, and a notable degree carbon capture.

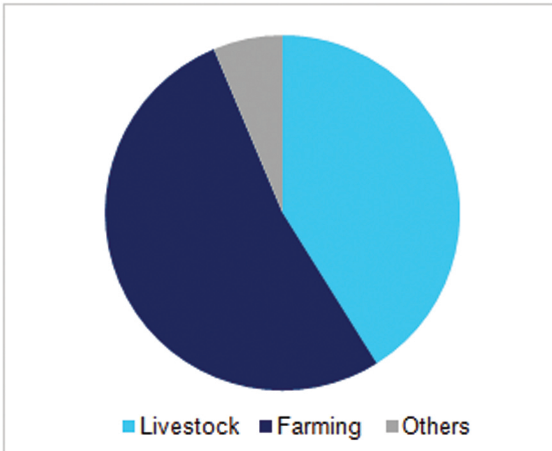


US Biochar Market (Kilotons)

The United States Biochar Market has grown 13.1% annually over the last decade. If trends continue, the overall size of the market is estimated to reach $3.14 Billions by 2025. Agriculture emerged as the largest application segment in 2015 and is estimated to generate revenue over USD 2.44 billion by 2025. The U.S. biochar market in livestock was 24.9 kilotons in 2015 and is estimated to reach a total volume of over 78.8 kilotons by 2025.

In the home, lawn & garden market we expect the most adoption momentum for biochar usage for insect and weed control, soil, and plant food. Among those concerned with food, child and pet safety, there is a surge in awareness of the impact of chemicals. In 2016, there was an average end consumer retail price of $1.56 per lb of biochar.

US Biochar Market by Sector

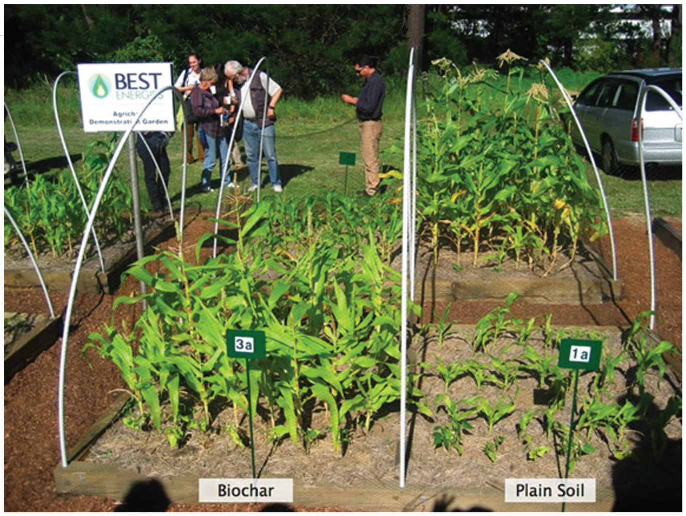


The expected uptick in adoption here, as well as in other organic sectors, stems from millennials aging, resulting in an upsurge in purchases around the home (like gardening products). As millennials continue to account for an increasingly significant percentage of purchases, they will drive growth of organics across categories.

Biochar is an emerging industry and the product is at its nascent stage. Its ability to enhance soil fertility and plant growth is expected to be a key factor on account of growing global population and rising demand for organic food.

BIOCHAR MARKET

Customers



Livestock - 90% of the biochar produced in Europe is used in livestock farming. The health – and consequently the well-being – of the livestock improve within just a short space of time. As regards nasty smells and nutrient losses, the use of biochar could even herald a new age of livestock farming, closing agricultural cycles of organic matter.

Farmers who add biochar to litter soon notice birds will peck bits of char. They deliberately eat char – an intentional behavior, not accidental or casual. Birds seem to know char is a useful substance. So, beyond use in litter, biochar is also being used as a feed supplement.

Substantial data on four continents consistently reveal biochar as feed additive provides direct benefits to livestock.

Research which showed how much healthier goat and dairy milk was when goats and cows were fed charcoal.

Agriculture - Biochar is effective in retaining water and nutrients in the root zone where it is available to plants, increasing soil tilth, and supporting microbial communities. Biochar is highly recalcitrant, it does not easily decay, and thus has the ability to sequester organic carbon for millennia

Biochar's probiotic benefits improve if char is pre-inoculated with digestive microbes. Thus, a wise way to use char is as a substrate to culture, transport and deploy diverse, complex microbe communities. A fully probiotic approach must adapt to unique conditions and needs. A microbe culture for seed planting is different than for compost tea, or cooking compost, or foliar feeding spray, or planting trees must be modified to meet each specialized environment and purpose.

Lawn & Garden - Biochar is compatible with soils and gardens, and has been shown to provide benefits to soil, plants and our environment.

Incorporating quality biochar into soil increases the abundance of soil microorganisms, soil nutrient retention and water storage, and soil carbon content.

Adding biochar to the soil around the roots of a tree will help reduce disease to the roots and keep as much nitrogen and nutrients close to tree.

In lawncare, soil supported with biochar had grass seed germinate faster and grow taller.

Biochar has many benefits for trees, potted plants, flowers and lawns.

CGH Power Financial Projections (199 ton/day)

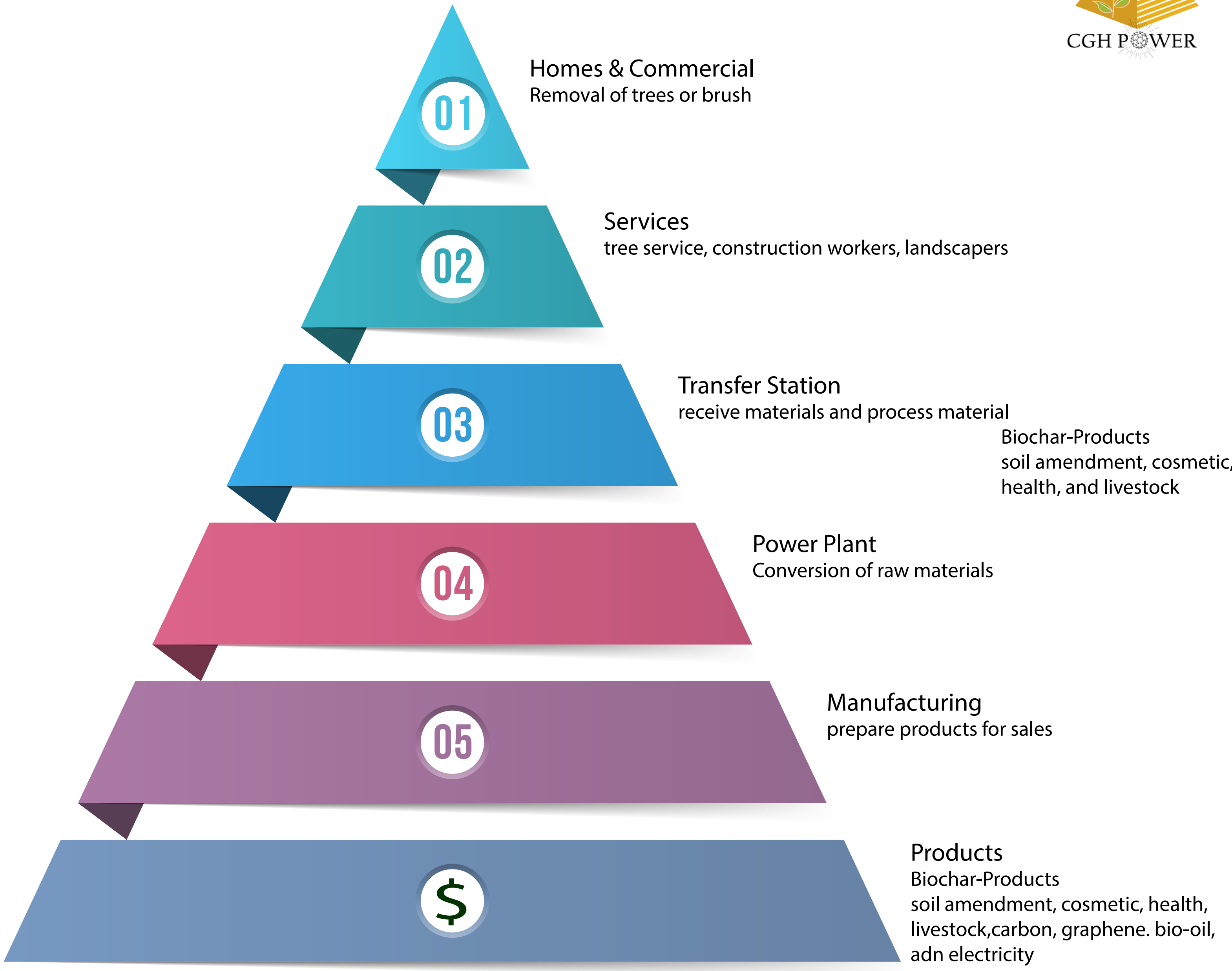
	Monthly	Annually
Expenses:		
Employee Payroll (12 Employees approx $37.5/hr)	$ 72,000	$ 864,000
Fuel Cell Lease (2-2.1 MW Biogas Fuel Cell)	137,000	1,644,000
Property Lease (1 acre facility)	50,000	600,000
Equipment Maintenance (5 year depreciation)	20,270	243,240
Utilities (electricity, water, sewage, internet, phone)	1,700	20,400
Misc (food/drinks/office supplies)	1,583	19,000
Total Expenses	$ 282,553	$ 3,390,640
Revenue:		
Waste Wood Recycling (199 tons per day @ $13/ton)	$ 77,610	$ 931,320
BioChar (13.27 tons per day @ $500/ton)	199,000	2,388,000
Activated Carbon (26.53 tons per day @ $1,750 per ton)	1,393,000	16,716,000
Electricity (48 MWh per day @ $0.50/MWh)	72,000	864,000
Total Revenue	$ 1,741,610	$ 20,899,320
Assets:		
Equipment		$ 1,214,200
Cash In Hand		1,000,000
Total Assets		2,214,200
Debt:		
Capital Cost		$ 1,216,200
Cash in Hand		1,000,000
Total Start-Up Cost		2,216,200

	Monthly	Annually
Profit *(before taxes)*	$ 1,459,057	$ 17,508,680
Taxes	437,717	5,252,604
Profit *(after taxes)*	$ 1,021,340	$ 12,256,076
Cap & Trade Credit *(tax-free)*	724,360	8,692,320
Total Profit ***(w/Cap & Trade credits)***	**$ 1,745,700**	**$ 20,948,396**

Annual Return on Investment ***(w/out Cap & Trade credits)***	**553.20%**
Return on Invested Capital ***(w/out Cap & Trade credits)***	**.18 years**
Annual Return on Investment ***(w/Cap & Trade credits)***	**945.24%**
Return on Invested Capital ***(w/Cap & Trade credits)***	**.11 years**

"The best investment you'll ever make."
- Jim Piazzo, CEO & Chairman

The process for Clean Green Hydrogen Power,inc



Woody Biomass

Electrical Energy Service Provider

CGH POWER

Electrical Service Information

Energy sources that are not depleted when used or are naturally replenished within a human lifetime.

Renewable energy systems produce less greenhouse gas emissions than fossil fuel energy systems.

Will Woody Biomass at work for you ?

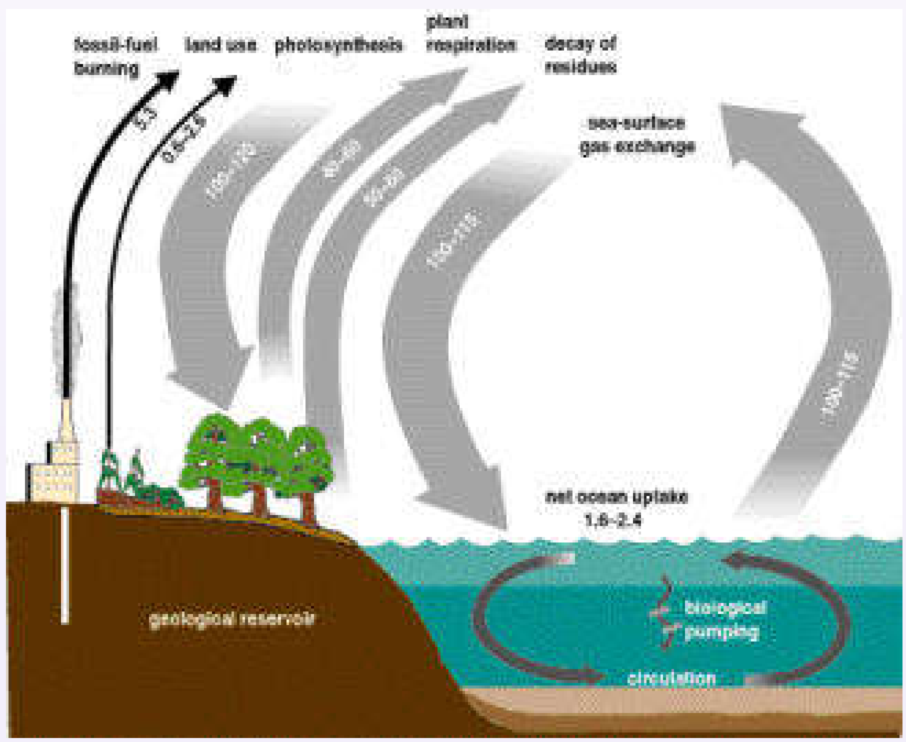
CONNECTING YOUR BUSINESS TO CGH POWER FUEL-CELLS

The **benefits** of utilizing **woody biomass** for bio-based products, particularly **energy** and biofuels, are many and varied. ... In addition to being a sustainable renewable **energy** source, **woody biomass** can help to mitigate greenhouse gas emissions, to create healthier forests, and to reduce the risk of wildfires.

The benefits of utilizing woody biomass for bio-based products, particularly energy and biofuels, are many and varied. These benefits are environmental, economic, social, and energy related. Utilization of woody biomass for bioenergy, for example, can help mitigate greenhouse gases, contribute to the development of healthier forests, bolster rural economies, and reduce the nation's dependency on foreign oil.

Environmental Benefits.

There are several environmental benefits associated with the utilization of woody biomass for bioenergy and other bio-based products. In addition to being a sustainable renewable energy source, woody biomass can help to mitigate greenhouse gas emissions, to create healthier forests, and to reduce the risk of wildfires.



Benefits

- Ultra-Clean
- Highly Efficient
- Small Footprint
- Fuel Flexible

Reduces Operating Costs

- Affordable power priced below the grid
- Avoid capital investment by only paying for power as it is produced
- Highly efficient combined heat and power (CHP) further supports economics and sustainability goals

Long-term Service Agreement

Energy performs all operation, maintenance and service of the CGHP power solutions on behalf of customer.

How a Fuel Cell Works

Fuel cells cleanly and efficiently convert chemical energy from hydrogen-rich fuels into electrical power and high quality heat via an electrochemical process that is highly efficient and emits water rather than pollutants as there is no burning of the fuel.

Similar to a battery, a fuel cell is comprised of many individual cells that are grouped together to form a fuel cell stack. Each individual cell contains an anode, a cathode and an electrolyte layer. When a hydrogen-rich fuel such as clean natural gas or renewable biogas enters the fuel cell stack, it reacts electrochemically with oxygen (i.e. ambient air) to produce electric current, heat and water. While a typical battery has a fixed supply of energy, fuel cells continuously generate electricity as long as fuel is supplied.

Fuel Cell Energy's power plants are based on carbonate fuel cell technology. The carbonate fuel cell derives its name from its electrolyte, which consists of potassium and lithium carbonates. To produce electricity, carbonate fuel cells generate hydrogen directly from a fuel source, such as natural gas or renewable biogas, via an internal reforming process. This approach, which is patented by Fuel Cell Energy, is a distinct competitive advantage of carbonate fuel cells as it allows readily available fuels to be used.

Fuel cells enhancing power reliability and sustainability while generating cost savings

Electrical Consumption Costs and Savings

The table below covers the details of the electrical consumption, costs and savings.

Monthly Electrical Power	200,000 kwh
Monthly Electrical Power Costs	$ 33,400.00 - $ 37,000.00
Monthly Electrical Power Savings	$ 3,600.00 - $ 4,000.00
Annual Electrical Power Savings	$ 43,200.00 - $ 48,000.00

Lifetime Financial Breakdown

The table below details the expected lifetime costs and savings of your electrical service

Lifetime Electrical Power Savings (20 years)	$ 864,000.00 - $ 960,000.00
Initial Costs	$10,000.00 waived
Break-Even" Time	Automatic

Service Initiation & Installation Costs

The table below details the costs associated with your system installation and initiation.

Start Service Fee	$-48.89 - included
Electrical Power Connection (based on power! usage)	$ 3,349.99 included
Meter Installation Service	$ 1,250.00 included
Electrical Power Deposit	$ 35,000.00 waived

100%Renewable Electrical Power Rate

The table below details the costs associated with your electrical power consumption.

~~Tier 1 Usage kwh~~ Flat Rate Packages	~~$0.20350%~~ $0.17350
Power Charge Indifference Adjustment (PCIA) PG&E charges this fee for customers who switch out of PG&E's service.	~~11%~~ Included
Utility Users Tax Municipal tax for electrical usage.	~~10%~~ Included
Franchise Fee Surcharge This fee pays for PG&E's right to use public streets to run electric service to your home or business	~~1%~~ Included
Energy Surcharge This charge also applies regardless of your service provider. It is collected from all customers on behalf of the California Energy Commission	~~.03%~~ Included

Additional Benefits

The table below details the additional benefits associated with using electrical service.

Property Lease Agreement special term & condition SPWG will have the additional financial benefit of lease revenue from the lease of property by electrical service provider, pursuant to a separate lease agreement.	$10,890.00 /monthly

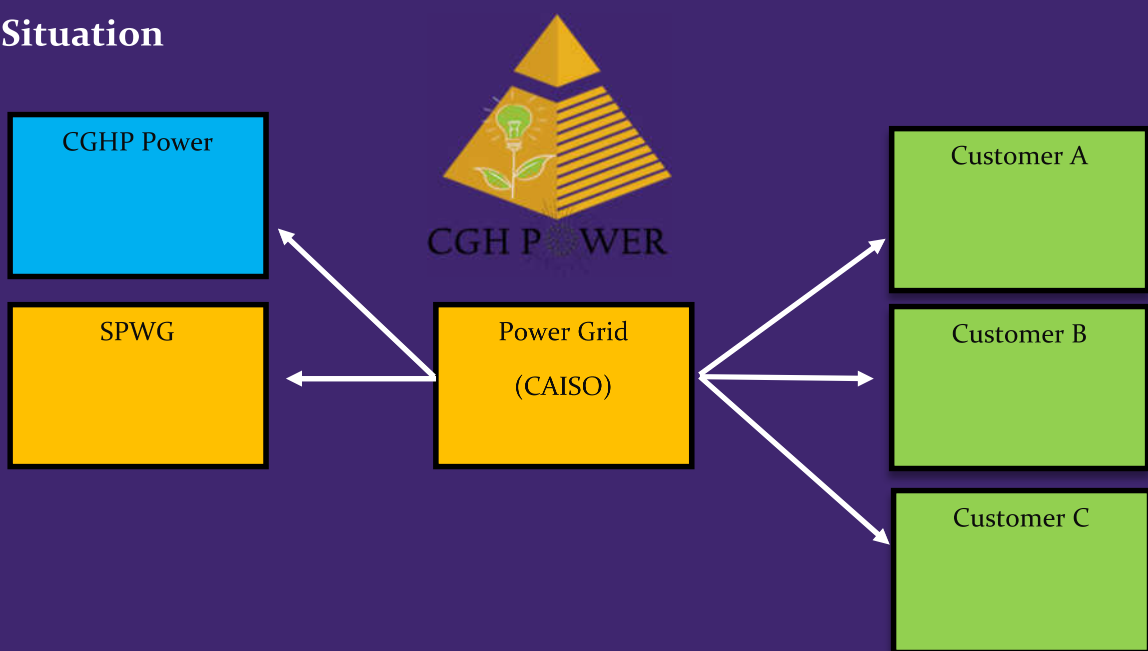
Annual & Lifetime Benefits from Electrical Service & Lease Agreement
The table below details the additional benefits associated with your electrical service and lease agreement.

Annual Electrical Power Savings	$ 43,200.00 - $ 48,000.00
Annual Property Lease Revenue	$ 130,680.00
Total Annual Benefits	$ 173,880.00 - $ 178,680.00
Lifetime Electrical Power Savings (20 years)	$864,000.00 -$960,000.00
Lifetime Lease Revenue (20 years)	$ 5,227,200.00
Lifetime Benefits (20 years)	$ 6,091,200.00 - $ 6,187,200.00

Timeline

The project will take 8 months complete. Permitting and construction delays could set the project back one to two years. With the help of the governor's office for permitting and special fuel cell permitting exemptions that exist for fuel cell and fuel cell generating equipment, we expect limited or no delays to the permitting process.

CGHP Situation



In our scenario

In our scenario, power generation is done on the same property as SPWG (customer), but what remains the same, is that each the customer and power generator each retains their own separate connection to the power grid. This assures that power will not be interrupted to customer, because customer still retains and uses existing electrical connection to the power grid, nothing is changed from a physical point of view. What changes is an accounting change. The switch makes CGH Power accountable for the power usage of its customers including SPWG. CGHP Power is now responsible for the electrical usage and subsequently the billing of its customers, and the monetary charges for electrical power for its use

Frequently Asked Questions

How will transferring electrical service to CGH Power, Inc effect the quality of my electrical service?

- Once the switch occurs, the customer will retain existing connection to the power grid and receive electrical power from the grid as normal. Physically, the power connection and the electricity received does not change. No new connection to the power grid or meter will need to be made, and the electrical power received by your business will never stop or be interrupted. The quality of electricity received the business from not change.

Will my electrical power supply be interrupted by the switch?

- Your electrical power supply from the power grid will never be interrupted during the switch. Customers who switch to CGH Power will need to make no physical changes to the electrical power system.

What if CGH Power, Inc. does not fulfill its energy production objectives at any time, during construction or operation, will my electrical power be effected?

- If CGH Power , Inc. is unable to fulfill its electrical energy production obligations, the electrical power your business receives will not be interrupted or stopped. You will continue receive electrical power from the power grid, and your electrical rate schedule between the customer and CGH Power , Inc. will still apply, until customer completely switches back to electrical energy service provided by PG&E.

How long will the process take to switch over to CGH Power , Inc.?

- If there are no delays in the process, it takes 6 months for PG&E to change a customer to receive electrical energy service from CGH Power , Inc.

U.S. Department of Energy – Energy Efficiency and Renewable Energy
Bioenergy Technologies Office
Demonstration and Market Transformation
Integrated Biorefinery Optimization
Funding Opportunity Announcement Number: DE-FOA-0001689
CFDA Number: 81.087 Renewable Energy Research and Development

Lead Organization Submitting Proposal:
Clean Green Hydrogen Power, Inc.
Private Business

Biorefinery Ash to Agricultural Products

Technical Contact:

Tony Hammon
Research & Development Manager
R&D Section
650 Kings row
San Jose, CA 95112
V: (408) 800-8834
F: (408) 286-3633
info@californiasgreenest.com

Business Contact:

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info@californiasgreenest.com

This project seeks to address the efficiency barriers associated with biorefinery production by converting biorefinery waste into agricultural products. It involves the development of a commercial scale 2 MW biorefinery waste ash to biochar and liquid fertilizer facility.

1. **Project Overview**

a. Background

The use of biomass refinery waste is considered to have the highest likelihood for valuable revenues streams and have the highest impact on biorefinery's profitability. Among the most exciting and widely touted claims regarding biorefinery waste ash is its use as industrial-grade agricultural biochar. Unlike other bioenergy operations, which depend on construed fossil-fuel off-sets in order to be considered a net carbon sink, biochar promises to increase terrestrial carbon stores by converting labile organic matter to highly recalcitrant organic matter, which may remain terrestrially sequestered for decades or centuries.

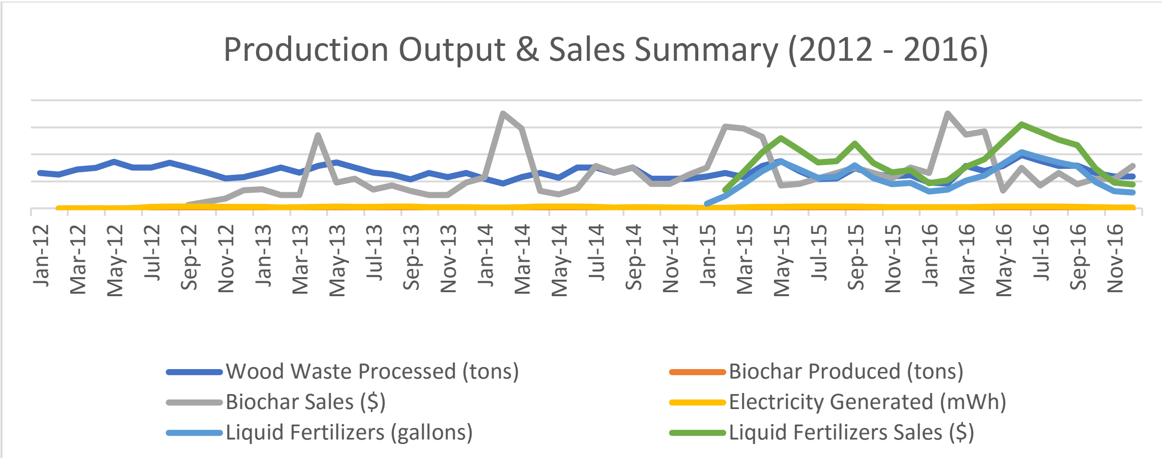
Moreover, the energy required to perform this conversion can be derived in part, or entirely, from the biomass itself. For these reasons biochar projects, which may be economically sustainable in their own respect, have the added advantage of being possibly rewarded by regulatory systems aimed at promoting carbon sequestration and penalizing operations which reduce terrestrial carbon stocks.

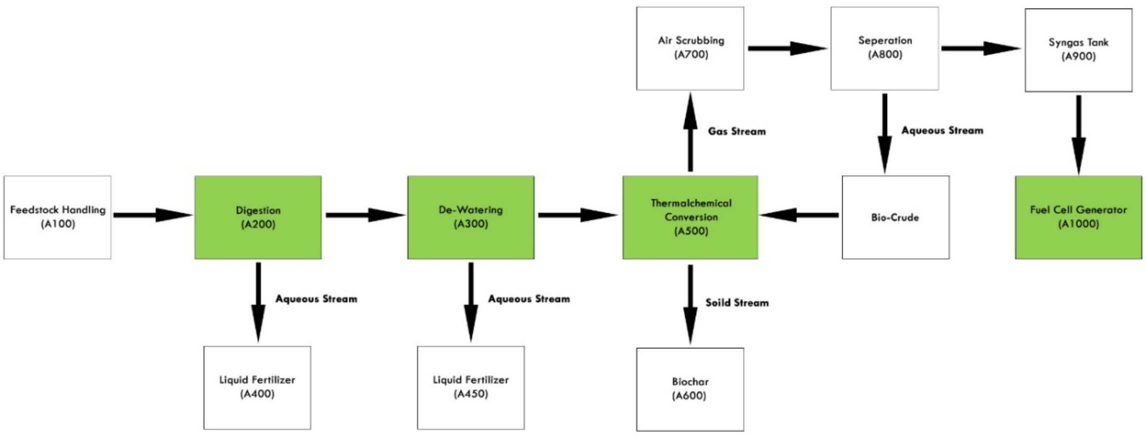
This proposal is for matching-funds to complete a $6 million, 2MW biomass energy to biochar facility at Shaver Lake, California. This is a combined effort with US Forest and State Forest agencies to remove dead trees from the Sierra Mountain region that is posing a fire hazard to local residents and businesses. The completed facility will produce 2MW of electricity 24 hours per day and output 14,400 tons of biochar per year. This is a 10x increase in scale from the applicant's demonstration unit.

With our experience and skills in green recycling into products, we have a proven track record of successful projects that which are built on time and to budget, we can commit to starting the project upon the 1st Sept 2017 and expect to finish the task by the 21st December 2019. The project already has technical plans and the cost for materials has been projected, site excavation and preparation is already underway.

The economic indicators for this case show that the minimum capital investment is given at $6,045,673 and 100% of owners' cost. The breakeven cost for the biochar produced is $275. If a tipping fees of $40/ton and electricity sales of $20 per MWh is introduced the breakeven biochar cost is lowered from $275 to $55 per ton. The levelized cost of energy for the power generation, when tipping fees and biochar sales are accounted for is -$389.36/MWhe, which is highly economically efficient compared with electricity generated by fossil fuel power plants.

Applicant sells its products under the trade name, "California's Greenest" and has a line of organic growing products made from recycled yard waste





2. **Technical Innovation**

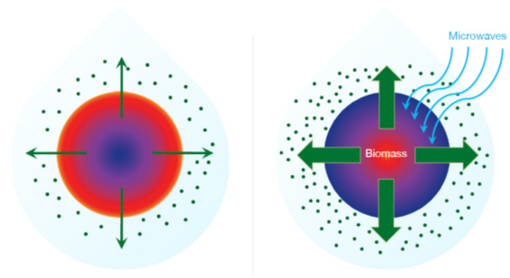
a. Overview

In thermochemical conversion technology, the needed heat energy can be provided by:

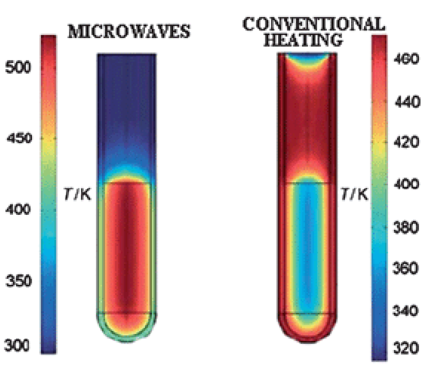
- Heat transfer form a heating source, it called conventional thermochemical conversion,
- Heat generated within the heated material by an electromagnetic irradiation, it called microwave irradiation conversion.

b. Microwave Technology

The heating mechanism is different between conventional heating and microwave heating. In the case of conventional heating, heat is transferred from the surface to the core of the material through conduction driven by temperature gradients. Mass flow, which is always outward, is the movement of gaseous compounds generated by thermochemical reactions. Thus, heat flow and mass flow are countercurrent for conventional heating. In the case of microwave heating, microwaves induce heat at the molecular level by direct conversion of the electromagnetic energy into heat. Therefore, microwave irradiation can provide uniform internal heating for material particles, making the heat flow and mass flow concurrent. In addition, the surrounding of the biomass particle in conventional heating is very hot while that in microwave heating is relatively cool. The faster movement of emitted gaseous compounds and cooler surrounding in microwave heating is likely to cause less secondary reactions and hence results in higher yields of desirable products compared with conventional heating.



Microwave irradiation is an alternative heating method and has already been successfully used in some waste conversion technologies (Bu et al., 2012; Du et al., 2011; Wang et al., 2012). Microwave irradiation heating has many advantages over conventional processes, which include:



(1) Microwave can provide uniform internal heating for material particles since the electromagnetic energy is directly converted into heat at the molecular level (Sobhy and Chaouki, 2010).

(2) Microwave heating is easier to control due to its instantaneous response for rapid start-up and shut-down.

(3) The set-up of microwave system is simple, which facilitates its adaption to currently available large-scale industrial technologies.

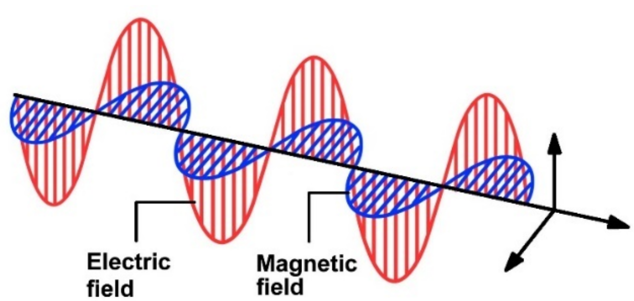
(4) It does not require high degree of feedstock grinding and can be used to handle large chuck of feedstock.

(5) Microwave heating is a mature technology and the development of microwave heating system is of low cost.

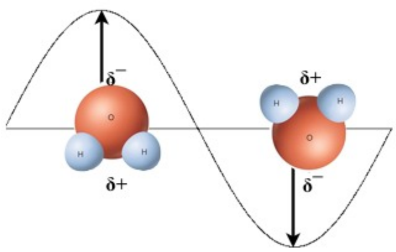
(6) Microwave heating provides higher syngas yields, less CO2 production, and contains virtually no polycyclic aromatic hydrocarbons (Fernández and Menéndez, 2011).

(7) Microwave heating provides a better-quality biochar at lower temperature and reduces the formation of oxides and other toxic compounds such as dioxins. (Salema and Ani, 2011).

Heating of material using microwave is a result of interactions between microwave irradiation and molecules in the material. Irradiation of a material at microwave frequencies results in the dipoles or ions aligning in the applied electric field, giving rise to the main mechanisms of microwave heating: (a) dipole rotation; (b) ionic migration. As the applied field oscillates, the



dipole or ion field attempts to realign itself with the alternating electric field. In this process, energy is dissipated as heat from internal resistance to the rotation.

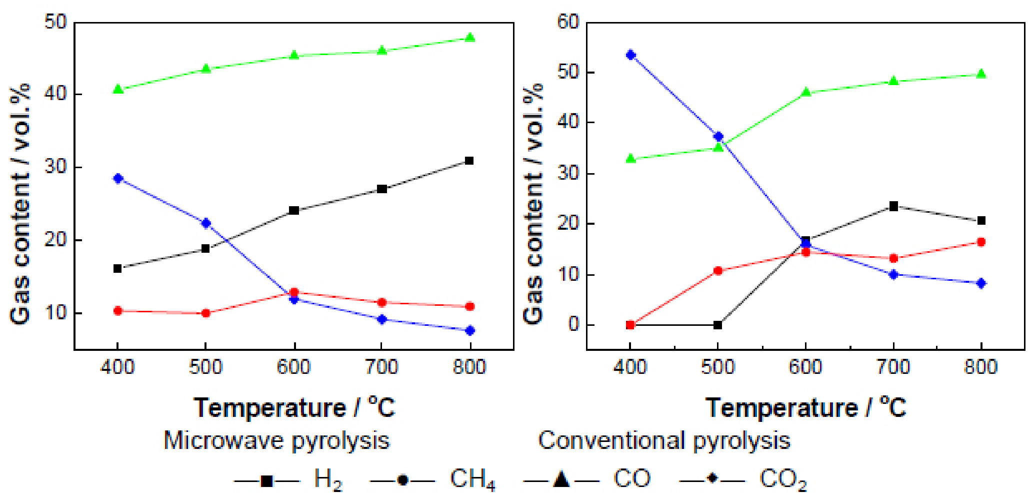


Microwave heating relies on the ability of a specific material to absorb microwave energy and convert it into heat, which in turn depends on the dielectric properties of the material, i.e., dielectric constant (ε′) and dielectric loss (ε″) (Thostenson and Chou, 1999). Materials with a high conductance and low capacitance (such as metals) have high dielectric loss factors. As the dielectric loss factor gets very large, the penetration depth approaches zero. Materials with this dielectric behavior are considered conductors or reflectors. Materials with low dielectric loss factors have a very large penetration depth. As a result, very little of the energy is absorbed in the material, and the material is transparent to microwave energy and considered insulator. Therefore, microwaves transfer energy most effectively to materials that have dielectric loss factors in the middle of the conductivity range. These materials are considered microwave absorbers.

The ratio of the dielectric loss to dielectric constant is referred to as the loss tangent, $\tan \delta = \varepsilon''/\varepsilon'$, which is used to describe the overall efficiency of a material to absorb microwave radiation. In general, materials can be classified as high ($\tan \delta > 0.5$), medium (0.1–0.5), and low microwave absorbing (<0.1). Most carbon materials except coal and carbon foam are good microwave absorbers, especially activated carbon and silicon carbide (SiC). These materials can be added to low loss biomass feedstocks during microwave assisted pyrolysis in order to improve heating, and such strategy has been proposed and tested by a number of researchers.

c. Syngas Yield

In terms of product distributions, yields, and quality, microwave-irradiation is reported to be superior to conventional thermochemical conversion. The bio-oils were obtained in larger quantities from microwave-irradiation and were found to contain virtually no polycyclic aromatic hydrocarbons (Domínguez et al., 2003), which are undesirable due to their carcinogenic and/or mutagenic effects.



In addition, significantly higher proportions of syngas and less CO_2 (almost double in some cases and less than half, respectively) were obtained in the gases from thermochemical conversion compared to those from conventional thermochemical conversion under strictly comparable conditions (Fernández and Menéndez, 2011).

Furthermore, the biochar generated during conventional thermochemical conversion processes is usually fragile due to the convective heating profiles and differences in temperatures of the outer and inner surface. Comparatively, the homogeneous and selective heating of microwave-irradiation leads to a higher quality biochar at lower temperatures (Salema and Ani, 2011). Since no oxygen is present during the microwave-irradiation process, the formation of oxides and other toxic compounds such as dioxins is minimized under usual working conditions.

Du et al. (2011) investigated microwave irradiation heating of *Chlorella sp.* with char as microwave reception enhancer and obtained the maximum bio-oil yield of 28.6% under the microwave power of 750 W.

Beneroso et al. (2015) investigated microwave irradiation heating of several different biomass feedstock species and found that heating through microwave yielded 33-65% more syngas.

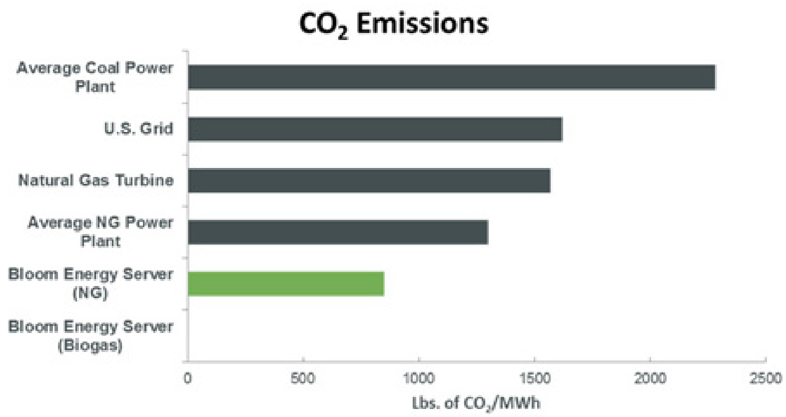
Beneroso et al., 2015	Microalgae	MSW	Straw
Microwave Gas Yield (wt%)	57.2	48.3	55.9
Conventional Gas Yield (wt%)	34.7	36.1	37.6
Increment	64.8%	33.8%	48.7%
Microwave Syngas vol%	94.0	94.6	95.2
Conventional Syngas vol%	53.0	72.5	79.8
Increment	77.4%	30.5%	19.3%

a. Syngas Electrical Generators

Syngas Electrical Generators, are solid oxide fuel cells which convert synthetic gas into energy using a direct electrochemical reaction *without* combustion. This highly efficient process is not bound by the same thermodynamic constraints for creating electricity and thus enables exceptionally high conversion efficiency. Bloom Energy Server is the name of the product produced by Bloom Energy, Inc a Syngas Electrical Generator manufacturer and supplier of fuel cells for this project.

Technology	Heat Rate / Efficiency	Line Losses	CO2 lbs/ MWh	Annual Capacity Factor	Annual US CO2 Emissions Reduction Per MW of Capacity (lbs)
US CCGT	7,388 / 51 %	8.33%	942	52%	2,764,782
Bloom Energy ES5 @ maximum efficiency	5,811 / 65%	0%	679	95%	7,238,122
Bloom Energy ES5 @ minimum efficiency	7,1217 / 53%	0%	833	95%	5,957,982

Bloom Energy manufactures solid state oxide fuel cells which are at the highest level of efficiency amongst commercially electrical combustion technologies. Greater energy efficiency means less fuel consumed to produce the same output of electricity, and that lower fuel consumption corresponds to fewer CO_2 emissions. Even when compared to advanced centralized combined cycle gas turbine power plants equipped with the best available control technology (BACT) — the US EPA's benchmark — Bloom Energy Servers delivers a lower CO_2 footprint due to higher electricity efficiency.



Because Bloom uses solid oxide fuel cell technology that converts fuel into electricity via an electrochemical reaction, Bloom Energy Servers eliminate virtually all smog forming particulates and harmful NOx and SOx emissions that are emitted by conventional power plants.

Bloom's clean energy technology uses no water during normal operation beyond a 240-gallon injection at start up. Compared to the generation of 1 MW of Bloom, the average U.S. coal plant uses 58.2 million gallons of water per 200 kW annually; combined cycle natural gas plants use 420,000 gallons per 200 kW annually. A 1MW Bloom Energy project would save up to 86 million gallons a year compared to the U.S. Grid.

Water Usage Compared

Generation Type	Gallons per MWh	Annual Gallons (per MW of Bloom equivalent generation)
Bloom Energy Server	0	.001 million
Combined Cycle Nat Gas Plant (cooling tower)	250	2.1 million
Coal Power Plant (open loop cooling)	35,000	291 million
U.S. Grid	10,300	86 million

3. **Environmental Assessment**

a. Environmental effects of biochar production

Among the most exciting and widely touted claims regarding biochar is its potential to mitigate climate change (Gurwick et al., 2013 and Jeffery et al., 2015). Unlike other bioenergy operations, which depend on construed fossil-fuel off-sets in order to be considered a net carbon sink (Ter-Mikaelian et al., 2015), biochar promises to increase terrestrial carbon stores by converting labile organic matter (i.e. that largely destine for the atmosphere in a matter of months to years) to highly recalcitrant organic matter (i.e. that which may remain terrestrially sequestered for decades or centuries).

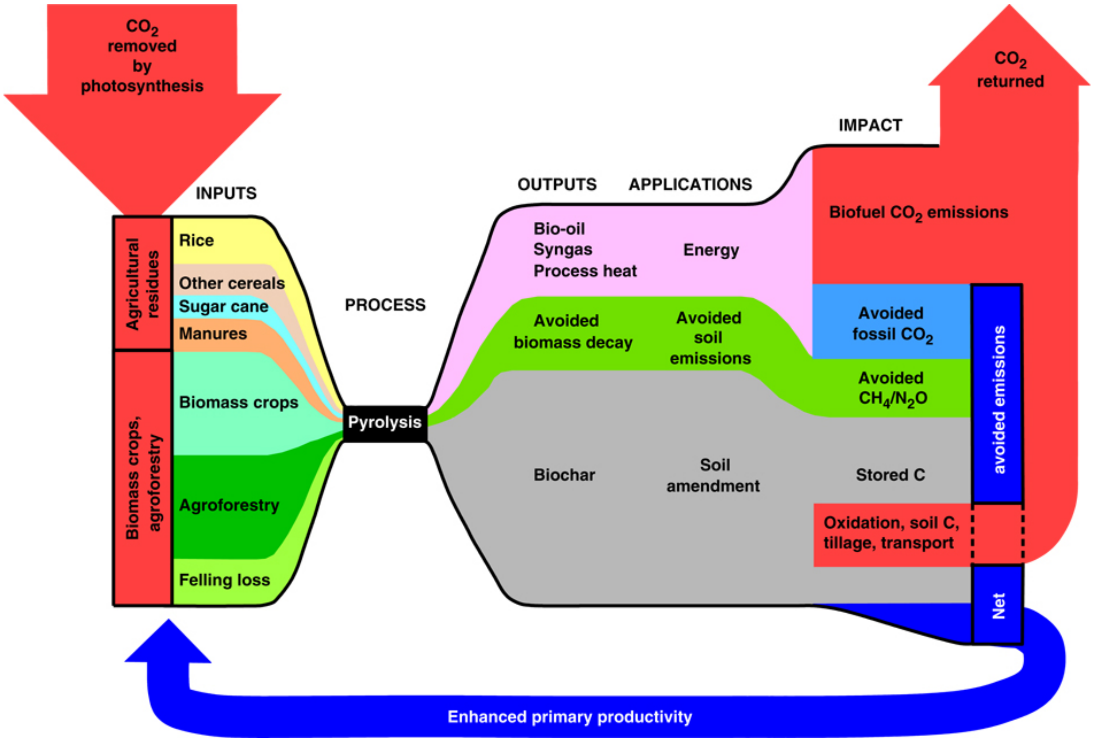
Moreover, the energy required to perform this conversion can be derived in part, or entirely, from the biomass itself (De Gryze, 2010 and Stewart et al., 2013). For these reasons biochar projects, which may be economically sustainable in their own respect, have the added advantage of being possibly rewarded by regulatory systems aimed at promoting carbon sequestration and penalizing operations which reduce terrestrial carbon stocks (De Gryze, 2010). At the moment, there is no US-sanctioned certification process by which biochar operations could be financially credited for carbon sequestration, however the regulatory system defining the market value of carbon sequestration is evolving rapidly at the state level. Therefore, being able to evaluate the carbon consequences of biochar operations, is a critical facet of the applicant's proposed feasibility assessment. To that end, this report models the origin and fate of forest carbon as it moves from forest through biochar production and eventually to agricultural soils.

To perform this analysis, temporally-dynamic ecosystem models are employed that tracks carbon from forest to biochar production facility to agricultural soil pools. This model has been successfully used to evaluate the impact of timber harvest, fuels reduction, and natural disturbance on net ecosystem carbon balance (Campbell et al., 2012), and will be modified for this study to include a biochar pool, fed by forest fuels and sent to agricultural soil pools. Default parameters describing the carbon flow associated with fuels treatments and forest growth are widely available and can be specified to reflect specific operations. Parameters describing the energy costs associated with feedstock recovery and transportation are also widely available and can be specified to reflect the delivery networks. Currently, the most variable and uncertain parameters are those involving the biochar conversion efficiencies and soil residence time (Gurwick et al., 2013).

Biochar's climate-mitigation potential stems primarily from its highly recalcitrant nature (Schmidt et al., 2000, Kuzyakov et al., 2009 and Cheng, 2008), which slows the rate at which photosynthetically fixed carbon is returned to the atmosphere. In addition, biochar yields several potential co-benefits. It is a source of renewable bioenergy; it can improve agricultural productivity, particularly in low-fertility and degraded soils where it can be especially useful to the world's poorest farmers; it reduces the losses of nutrients and agricultural chemicals in run-off; it can improve the water-holding capacity of soils; and it is producible from biomass waste (Lehmann et al., 2009 and Lenton et al., 2009). Of the possible strategies to remove CO_2 from the atmosphere, biochar is notable, if not unique, in this regard.

Biochar can be produced at scales ranging from large industrial facilities down to the individual farm (Lehmann et al., 2009), and even at the domestic level (Whitman et. al., 2007) making it applicable to a variety of socioeconomic situations. Various technologies are commercially available that yield different proportions of biochar and bioenergy products, such as bio-oil and syngas. The gaseous bioenergy products are typically used to generate electricity; the bio-oil may be used directly for low-grade heating applications and, potentially, as a diesel substitute after suitable treatment (Elliot et. al., 2007).

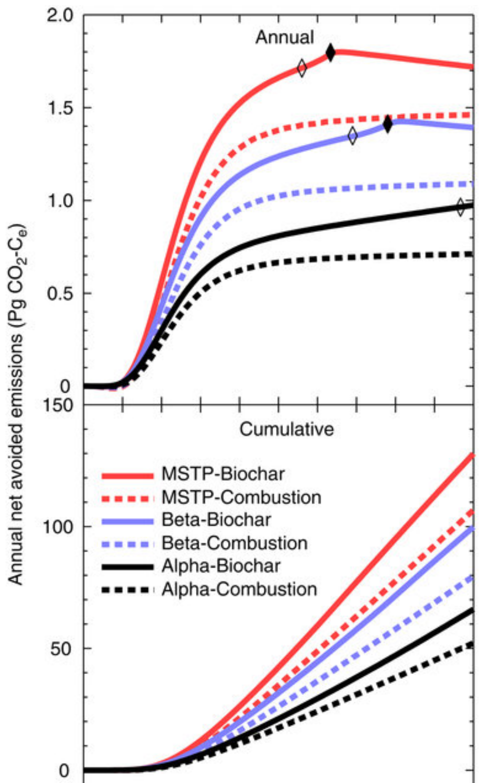
In the sustainable-biochar concept CO_2 is removed from the atmosphere by photosynthesis. Sustainably procured crop residues, manures, biomass crops, timber and forestry residues, and green waste are thermochemically converted by modern technology to yield bio-oil, syngas, process heat and biochar. As a result of the thermochemical conversion, immediate decay of these biomass inputs is avoided. The outputs of the process serve to provide energy, avoid emissions of GHGs such as methane (CH_4) and nitrous oxide (N_2O), and amend agricultural soils and pastures. The bioenergy is used to offset fossil-fuel emissions, while returning about half of the C fixed by photosynthesis to the atmosphere. In addition to the GHG emissions avoided by preventing decay of biomass inputs, soil emissions of GHGs are also decreased by biochar amendment to soils. The biochar stores carbon in a recalcitrant form that can increase soil water- and nutrient-holding capacities, which typically result in increased plant growth. This enhanced productivity is a positive feedback that further enhances the amount of CO_2 removed from the atmosphere. Slow decay of biochar in soils, together with tillage and transport activities, also returns a small amount of CO_2 to the atmosphere.



The above figure shows inputs, process, outputs, applications and impacts on global climate. Within each of these categories, the relative proportions of the components are approximated by the height/width of the colored fields. CO2 is removed from the atmosphere by photosynthesis to yield biomass. A sustainable fraction of the total biomass produced each year, such as agricultural residues, biomass crops and agroforestry products, is converted by pyrolysis to yield bio-oil, syngas and process heat, together with a solid product, biochar, which is a recalcitrant form of carbon and suitable as a soil amendment. The bio-oil and syngas are subsequently combusted to yield energy and CO2. This energy and the process heat are used to offset fossil carbon emissions, whereas the biochar stores carbon for a significantly longer period than would have occurred if the original biomass had been left to decay. In addition to fossil energy offsets and carbon storage, some emissions of methane and nitrous oxide are avoided by preventing biomass decay and by amending soils with biochar. Additionally, the removal of CO2 by photosynthesis is enhanced by biochar amendments to previously infertile soils, thereby providing a positive feedback. CO2 is returned to the atmosphere directly through combustion of bio-oil and syngas, through the slow decay of biochar in soils, and through the use of machinery to transport biomass to the pyrolysis facility, to transport biochar from the same facility to its disposal site and to incorporate biochar into the soil. In contrast to bioenergy, in which all CO2 that is fixed in the biomass by photosynthesis is returned to the atmosphere quickly as fossil carbon emissions are offset, biochar has the potential for even greater impact on climate through its enhancement of the productivity of infertile soils and its effects on soil GHG fluxes.

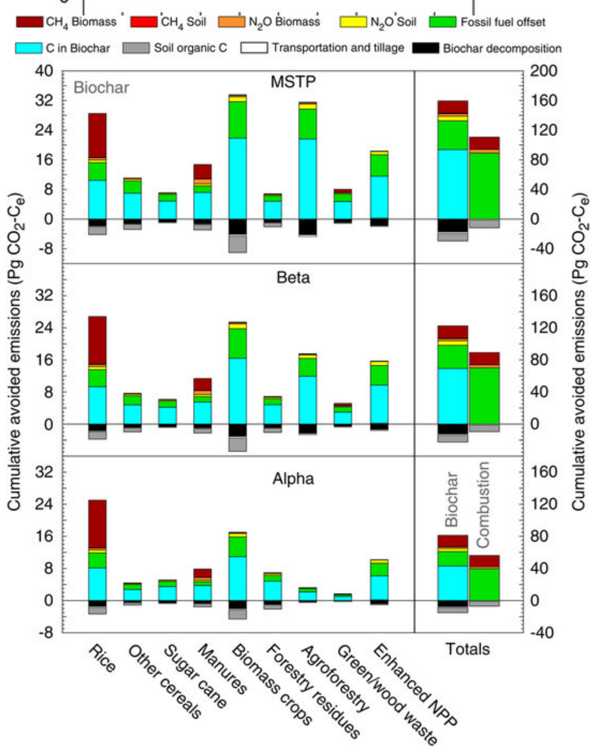
b. Avoided GHG emissions

Results for the three scenarios are expressed below as a range from the Alpha scenario first to the MSTP last. The model predicts that maximum avoided emissions of 1.0–1.8 Pg CO2-Ce per year are approached by mid-century and that, after a century, the cumulative avoided emissions are 66–130 Pg CO2-Ce. Half of the avoided emissions are due to the net carbon sequestered as biochar, 30% to replacement of fossil-fuel energy by pyrolysis energy and 20% to avoided emissions of CH4 and N2O.



The avoided emissions are attributable to sustainable biochar production or biomass combustion over 100 years, relative to the current use of biomass. Results are shown for the three model scenarios, with those for sustainable biochar represented by solid lines and for biomass combustion by dashed lines. The top panel shows annual avoided emissions; the bottom panel, cumulative avoided emissions. Diamonds indicate transition period when biochar capacity of the top 15 cm of soil fills up and alternative disposal options are needed.

A detailed breakdown of the sources of cumulative avoided GHG emissions over 100 years is given in the figure below. The two most important factors contributing to the avoided emissions from biochar are carbon stored as biochar in soil (43–94 Pg CO2-Ce) and fossil-fuel offsets from coproduction of energy (18–39 Pg CO2-Ce).



The data are for the three model scenarios over 100 years by feedstock and factor. The left side of the figure displays results for each of eight feedstock types and the additional biomass residues that are attributed to NPP increases from biochar amendments; the right side displays total results by scenario for both biochar (left column) and biomass combustion (right column). For each column, the total emission-avoiding and emission-generating contributions are given, respectively, by the height of the columns above and below the zero line. The net avoided emissions are calculated as the difference between these two values. Within each column, the portion of its contribution caused by each of six emission-avoiding mechanisms and three emission-generating mechanisms is shown by a different color. These mechanisms (from top to bottom within each column) are (1) avoided CH4 from biomass decay, (2) increased CH4 oxidation by soil biochar, (3) avoided N2O from biomass decay, (4) avoided N2O caused by soil biochar, (5) fossil fuel offsets from pyrolysis energy production, (6) avoided CO2 emissions from carbon stored as biochar, (7) decreased carbon stored as soil organic matter caused by diversion of biomass to biochar, (8) CO_2 emissions from transportation and tillage activities and (9) CO_2 emissions from decomposition of biochar in soil.

Of the beneficial feedbacks, the largest is due to avoided CH_4 emissions from biomass decomposition (14–17 Pg CO_2-Ce), predominantly arising from the diversion of rice straw from paddy fields. The next largest positive feedbacks, in order of decreasing magnitude, arise from biochar-enhanced NPP on cropland, which contributes 9–16 Pg CO_2-Ce to the net avoided emissions (if these increased crop residues are converted to biochar), followed by reductions in soil N_2O emissions (4.0–6.2 Pg CO_2-Ce), avoided N_2O emissions during biomass decomposition (1.8–3.3 Pg CO_2-Ce) and enhanced CH_4 oxidation by dry soils (0.44–0.8 Pg CO_2-Ce).

Of the adverse feedbacks, biochar decomposition is the largest (8–17 Pg CO_2-Ce), followed by loss of soil organic carbon due to diversion of biomass from soil into biochar production (6–10 Pg CO_2-Ce), and transport (1.3–1.9 Pg CO_2-Ce). Contributions to the overall GHG budget from tillage (0.03–0.044 Pg CO_2-Ce) and reduced N-fertilizer production (0.2–0.3 Pg CO_2-Ce) are negligible (although their financial costs may not be).

The relative importance of all these factors to the GHG budget varies considerably among feedstocks. Notably, rice residues, green waste and manure achieve the highest ratios of avoided CO_2-Ce emissions per unit of biomass-carbon (1.2–1.1, 0.9 and 0.8 CO_2-Ce/C, respectively) because of the benefits of avoided CH_4 emissions.

Ultimately, the amount of carbon sequestration (or emissions) attributed to a regional biochar operation will depend on the baseline used. For instance, future carbon markets may opt to view biochar feedstock as an inevitable by-product of forest restoration activities and therefore carbon neutral at their point of generation.

4. **Economic Analysis**

a. *ECLIPSE simulation*

The ECLIPSE simulation shows that the yield of biochar produced in the microwave gasifier is around 6,629 kg per hour and the producer gas is about 39.57 MMBtu/hour. Gross electric power generated by the energy recovery system is 2.0 MWhe. The results of the economic analysis demonstrate that if the plant is paying $40/ton for receiving and handling the green waste without the options of selling either heat or electricity, the Breakeven Cost for the biochar from the selected system is estimated at $275 per ton. If the sales of electricity produced by the system are assumed to be about $20/MWhe, this value will go down to $254 per ton. The case studies also indicate that if a tipping fee of $40/ton is introduced, the biochar cost can be reduced from $254 to $55 per ton, accounting for 79% cost reduction. The Levelized Cost of Electricity for the power generation, when tipping fees and biochar sales are accounted for, will be -$389.36/MWhe, which is highly economically efficient compared with electricity generated by fossil fuel power plants.

The proposed plant is modelled and simulated using the ECLIPSE process simulation package, including the thermochemical conversion process, the microwave gasifier, the energy recovery process and the integration of the whole system. The ECLIPSE simulation shows that when the feedstock is set to

33,148 kg/hour, the yield of biochar produced is around 6,629 kg per hour. The microwave gasifier generates 39.57 MMBtu/hour producer gas, if the energy recovery system is installed, the electricity generated is 2.0 MWh (Gross).

The economic indicators for this case show that the minimum capital investment is given at $6,045,673 and 100% of owners' cost. The breakeven cost for the biochar produced is $275. If a tipping fees of $40/ton and electricity sales of $20 per MWhe is introduced the breakeven biochar cost is lowered from $275 to $55 per ton.

5. Technical Work Plan

BUDGET PERIOD 1 (7 months)

Task 1: Direct Project Administration and Reporting

Clean Green Hydrogen Power, Inc.is the applicant and the grant manager for the CFDA Number: 81.087 Renewable Energy Research and Development Grant. The Grantee will administer these funds and respond to Department of Energy reporting and compliance requirements associated with the grant administration. The Grantee will act in a coordination role: disseminating grant compliance information to the Project Coordinators responsible for implementing the projects contained in this agreement, obtaining and retaining evidence of compliance (e.g., CEQA/NEPA documents, reports, monitoring compliance documents, labor requirements, etc), obtaining data for progress reports from individual Project Coordinators, assembling and submitting progress reports to the State, and coordinating all invoicing and payment of invoices.

- Subtask 2.1: Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with the Grantee. Prepare invoices including relevant supporting documentation for submittal via the Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.

Task 2: Land Purchase(s) /Easement(s)

No land acquisition or additional easements will not be needed for this project.

Task 3: Project Evaluation/ Design/ Engineering

This task involves the preparation of technical plans and designs that covers the basis of construction/ implementation methods that will be evaluated for the project components. This task completes the final design plans and specifications. A Feasibility Study/Basis of Design Report will be completed to develop and evaluate refined project alternatives. Work to complete the Basis of Design Report will include the following activities: land surveying, field reconnaissance, site evaluation, preparing conceptual design and cost estimates, and cultural resources investigation.

- Subtask 3.1: Performing preliminary and final design analyses.
- Subtask 3.2: Developing preliminary and final plans and specifications.
- **Milestone (Subtask 3.2)**: 100-percent Work Plan.
- Subtask 3.3: Developing preliminary and final construction cost estimates.
- **Milestone (Task 3)**: Feasibility Study/Basis of Design Report. Updated Project Cost Estimate.

Task 4: Environmental Documentation & Permitting

This task will consist of arranging for all necessary permits for the project. Permits are not required until such time as the construction project is undertaken, which is planned for a later phase not part of this Grant Agreement. During the project design phase, contact will be made with the County of Fresno Department of Public Works and Planning, the Central Valley Regional Water Quality Control Board, San Joaquin Valley Air Pollution Control District, County planning agencies, and other agencies that have statutory jurisdiction over organic recycling to initiate permit review in anticipation of construction.

- Subtask 4.1: Fresno County, Conditional Use Permit and Solid Waste Facilities Permit, Fresno County Department of Public Works and Planning, 220 Tulare Street, 6th floor, Fresno, CA 93721. Includes project description, siting location environmental setting preliminary information about geology, air quality, hydrology, biological resources, land use, traffic/transportation, utilities and public service, hazardous materials/waste, solid waste, noise, public health and safety, aesthetics, cultural and historic resources, housing, and recreation.
    - Subtask 4.1a: CEQA Documentation - A Notice of Preparation will be circulated followed by the preparation of a CEQA Initial Study (IS) and Mitigated Negative Declaration (MND) for the project. The MND document will be released for public review, and a Notice of Determination will be filed. Additionally, a "no legal challenges" letter (or "addressing legal challenges" letter) will be prepared.
- **Milestone (Subtask 4.1)**: Fresno County, Conditional Use Permit and Solid Waste Facilities Permit. Finding of No Significant Impact Issued by Fresno County Department of Public Works and Planning.
- Subtask 4.2: Air Quality Permit, San Joaquin Valley Air Pollution Control District, Central Region, 1990 E. Gettysburg Ave., Fresno CA 93726. Includes facility design drawings, emissions units equipment list and descriptions, emissions control equipment list (equipment models and serial numbers), emissions calculations, identification of available ERCs.
- **Milestone (Subtask 4.2)**: Air Quality Permit.
- Subtask 4.3: Waste/Storm Water Discharge Permit, Central Valley Regional Water Quality Control Board, 1685 "E" Street, Fresno, CA 93706, W. Dale Harvey, NPDES/Storm water Program Manager. Includes facility design drawings, facility process water balance, wastewater treatment/recycle system design specifications and drawings, projected storm water runoff volumes and capture system design.
- **Milestone (Subtask 4.3)**: Waste/Storm Water Discharge Permit.

Go/No-Go Decision Point 1: Engineering and Environmental-External Independent Review. DOE Preliminary Design Review and Approval to Continue Project. Applicant will submit all preliminary engineering, design, cost models, sites studies, etc. to DOE's Independent Engineer and Risk Analyst as specified in the EIR-1 guidelines. The Independent Engineer and Risk Analyst will submit independent reports to DOE. Applicant must adequately address all deficiencies and risk items to DOE's satisfaction before the project will be authorized to continue.

Task 5: Proposal Monitoring Plan

Discuss the goal(s) of the monitoring, how the monitoring will be accomplished, frequency, and monitoring location(s). The monitoring must provide the data required to meet the reporting requirements in ARB’s Funding Guidelines, Appendix 3.A, Table 3.A-9. These data include, but are not limited to, energy savings, GHG emission reductions, and project benefits to DACs resulting from the project. The monitoring plan should result in data collected that allows for a comparison of baseline and post-project benefits.

- **Milestone (Task 5)**: Proposal Monitoring Plan.

<u>BUDGET PERIOD 2 (7 months)</u>

Task 6: Guidelines for Acquisition of Projects and of Equipment and Purchasing

Acquisition management establishes procedures for the management and control of all inventorial equipment under the care and custody of the project and acquisition of equipment and materials thereof.

- Subtask 6.1: Acquisition Management (establish procedures for the management and control of all inventorial equipment and materials under the care and custody of the project
- Subtask 6.1: Equipment & Materials Purchasing (bid process, notice of award, notice to proceed, notice of completion).
- Subtask 6.2: Purchasing Administration activities (managing purchases, preparing change orders, managing budgets).
- **Milestone (Task 6)**: Guidelines for Acquisition of Projects and of Equipment and Purchasing.

Task 7: Project Management for Construction

This task involves construction or implementation, and construction administration including as-needed activities, including developing bid documents, preparing advertisement and contract documents, for construction contract bidding, conducting pre-bid meeting, bid opening and evaluation and selection of the contractor, award of contract, and issuance of notice to proceed.

- Subtask 7.1: Construction Contracting (bid process, notice of award, notice to proceed, notice of completion and managing contractor submittal review, answering requests for information).
- Subtask 7.2: Construction Administration activities (managing contractors, preparing change orders, managing budgets, issuing work directives, documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/ updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow and notifying contractor if work is not acceptable).
- Subtask 7.3: Other improvements may include fence installation and site restoration including repaving the streets and replacing landscaping.
- **Milestone (Task 7)**: Notice to proceed. Award of Contract.

Task 8: Operational Readiness / Operations-Performance Test

The operations-performance tests are used to conduct operational readiness of the facility prior to start-up. It involves identifying a small set of mobility performance measures that can serve the needs of operations performance measures; Developing, testing and documenting methods for implementing these measures at a system level; and make recommendations for future improvements to data gathering and measures estimation to improve the measures' accuracy, geographic precision, and sensitivity to operations programs.

- Subtask 8.2: Operations-Performance Test. Applicant runs commercial facility in accordance with performance test plan (approved by DOE) for a minimum of 40 hours. DOE and DOE's Independent Engineer are on site for portions of the test and Applicant delivers all data logs outlined in the performance test plan.
- **Milestone (Task 8)**: Operations-Performance Test Completed.

Task 9: Final Inspection and Start-Up

The final inspection and verification is scheduled with the installing contractor and corresponding verification inspector.

- Subtask 9.1: A final fire code and life safety inspection must be scheduled with the local Fire Marshal (if one exists). The general contractor/construction manager is responsible for scheduling required life-safety inspections for this project. This inspection must be scheduled when the building and grounds are substantially complete, but before the final occupancy inspection by the County Building Inspector.
- Subtask 9.2: A final electrical inspection is required on all interior and exterior electrical system installation for the project. The installing contractor is responsible for scheduling all required electrical inspections. The final electrical inspection must be completed and approved by the assigned State or local Electrical Inspector. Written verification of required final inspection(s) approval must be made available to the County Building Inspector before final occupancy inspection of the building.
- Subtask 9.3: A final plumbing inspection is required on all interior and exterior plumbing system installations. The installing contractor is responsible for scheduling all required plumbing inspections with the Plumbing Inspector/County Building Inspector. The final plumbing inspection must be completed and approved by the Plumbing Inspector/County Building Inspector. Written verification of required final inspection(s) approval must be made available to the County Building Inspector prior to final inspection of the building. Final plumbing inspection(s) may include requirements for: hydrostatic testing of water services, air tests on exterior sanitary and/or storm sewer piping, chlorination and subsequent flushing and bacterial testing of exterior water distribution systems, interior monometer testing, RPZ testing, potable water distribution system testing and subsequent chlorination and bacterial testing.
- Subtask 9.4: A final HVAC/mechanical system inspection is required on all interior and/or exterior building mechanical systems. The installing contractor is responsible for scheduling this inspection with the County Building Inspector. Final HVAC/mechanical system inspection(s) may include requirements for: hydrostatic testing of building service piping, gas line air tests, smoke and/or fire damper actuation testing and inspection, smoke control system operational testing and inspection, fuel burning equipment start-up or air handling equipment operational testing and inspection, etc. Written verification of required final inspection(s) (and required equipment test results) must be made available to the County Building Inspector before a final inspection of the building.
- Subtask 9.5: A final “zoning inspection” is required. It is the responsibility of the general contractor and/or construction manager to schedule all required local/jurisdictional final zoning inspections once complete. These inspections must be completed and approved - prior to the final occupancy inspection by the County Building Inspector.
- Subtask 9.6: A final Special Inspection & Testing Summary report must be completed and submitted to the County Building Inspector once all required special inspections are done for the project. The final summary report must essentially state that all required special inspections/testing have been completed, tested, and/or inspected as required by the code and by the structural engineer and/or architect of record.
- Subtask 9.7: The final occupancy inspection must be completed prior to moving any furnishings into the building. It must also be completed and approved prior to occupancy of the building. All aforementioned final inspections must be completed and approved as outlined herein - prior to scheduling the final occupancy inspection. It is the responsibility of the general contractor and/or the construction manager to schedule the final building occupancy inspection. This inspection is under the jurisdiction of the County Building Inspector. Upon successful completion of this

inspection, a Certificate of Occupancy will be issued. Building occupancy and use may then occur.

- **Milestone (Task 9)**: Final Verification / Permit Decision Rendered / Issuance of Certificate of Occupancy.

Go/No-Go Decision Point 2: Commission and Start-up. Mechanical completion verified. DOE's Independent Engineer will verify mechanical completion is reached as defined in applicant's construction and commissioning plan.

<u>BUDGET PERIOD 3 (12 months)</u>

Task 10: Business Operations & Management

Day-to-day business operations are the activities that the business and its employees engage in on a daily basis for the purposes of generating a profit and increasing the inherent value of the business as a going concern.

- Supply Chain Management - Management of the flow of goods and services, involves the movement and storage of raw materials, of work-in-process inventory, and of finished goods from point of origin to point of consumption.
- Financial management – Management of money (funds) to accomplish the objectives of the project.
- Operations Planning - planning strategic goals and objectives to tactical goals and objectives.
- Bench Marking - Determine what and where improvements are called for, analyze how other organizations achieve their high-performance levels, and use this information to improve performance.
- Expand market: Offer product or service to a wider section of an existing market or to a new demographic, psychographic or geographic market.
- Develop brand: Develop a recognized, respected and developed brand is highly valuable.
- **Milestone (Task 10)**: Full operating capacity reached (40 tons of biochar /day and 48 MWhe / day).

Go/No-Go Decision Point 3: Commission and Start-up. CD-4 Start of Operational Approval - Initiate Shakedown (DOE Core). DOE reviews project reports, financial reports, and Independent Engineer reports to make a go/no go decision for operations.

- Subtask 10.1: Operations-Continued Long Term Optimization. Applicant completes 7200 hours of continuous operation with 90 % uptime, 90% conversion of biomass to fuel, at a minimum of 200 tons/day of feedstock. Applicant provides summary reports as defined in deliverables requirements. DOE and DOE's Independent Engineer randomly sample data logs at Applicant's site.

Final Deliverables:

- Final Deliverable 1: Final Economic and Commercial Validation. Final Report Delivered to DOE. After 12 months of operation, Applicant provides final report which includes updated economic models, life cycle analysis, and plant performance (inputs, outputs, yields, etc.) as defined in the deliverable requirements.

Project Management and Reporting

Clean Green Hydrogen Power, Inc.is the applicant and the grant manager for the CFDA Number: 81.087 Renewable Energy Research and Development Grant. The Grantee will administer these funds and respond to Department of Energy reporting and compliance requirements associated with the grant administration. The Grantee will act in a coordination role: disseminating grant compliance information to the Project Coordinators responsible for implementing the projects contained in this agreement, obtaining and retaining evidence of compliance (e.g., CEQA/NEPA documents, reports, monitoring compliance documents, labor requirements, etc), obtaining data for progress reports from individual Project Coordinators, assembling and submitting progress reports to the State, and coordinating all invoicing and payment of invoices.

Milestone Summary Table							
Recipient Name:		Clean Green Hydrogen Power, Inc.					
Project Title:		Biorefinery Ash into Agricultural Products					
Task Number	**Task or Subtask (if applicable) Title**	**Milestone Type (Milestone or Go/No-Go Decision Point)**	**Milestone Number* (Go/No-Go Decision Point Number)**	**Milestone Description (Go/No-Go Decision Criteria)**	**Milestone Verification Process (What, How, Who, Where)**	**Anticipated Date (Months from Start of the Project)**	**Anticipated Quarter (Quarters from Start of the Project)**
3.2	Planning Activities	Milestone	M3.2	100-percent Work Plan	Recipient will provide 100-percent Work Plan to DOE for review and approval.	3	1
3	Engineering Design	Milestone	M3	Feasibility Study/Basis of Design Report. Updated Project Cost Estimate	Building design, specifications, and detailed costing data will be provided to DOE's Independent Engineer for review and verification against all applicable building codes and architectural standards.	3	1
4.1	Regulatory Approvals and Permitting	Milestone	M4.1	Fresno County, Conditional Use Permit and Solid Waste Facilities Permit. Finding of No	DOE Project Coordinator reviews report on progress towards permitting and regulatory compliance, verifying that all requirements have been initiated.	6	2

				Significant Impact Issued by Fresno County Department of Public Works and Planning.			
4.2	Regulatory Approvals and Permitting	Milestone	M4.2	Air Quality Permit	DOE Project Coordinator reviews report on progress towards permitting and regulatory compliance, verifying that all requirements have been initiated.	6	2
4.3	Regulatory Approvals and Permitting	Milestone	M4.3	Waste/Storm Water Discharge Permit	DOE Project Coordinator reviews report on progress towards permitting and regulatory compliance, verifying that all requirements have been initiated.	6	2
[redacted]		Go/No-Go Decision Point	Go/No-Go # 1	Engineering and Environmental-External Independent Review. DOE Preliminary Design Review and Approval to Continue Project.	Applicant will submit all preliminary engineering, design, cost models, sites studies, etc. to DOE's Independent Engineer and Risk Analyst as specified in the EIR-1 guidelines. The Independent Engineer and Risk Analyst will submit independent reports to DOE. Applicant must adequately address all deficiencies and risk items to DOE's satisfaction before the project will be	6	2

[redacted]					authorized to continue.		
5.0	Regulatory Approvals and Permitting	Milestone	M5	Proposal Monitoring Plan	Recipient will provide Proposal Monitoring Plan to DOE for review and approval.	7	3
6.0	Vendor Request for Proposals	Milestone	M6	Guidelines for Acquisition of Projects and of Equipment and Purchasing.	DOE personnel review vendor quotes and verify for legitimacy.	11	3
7.0	Pre-construction	Milestone	M7	Notice to proceed. Award of Contract.	All required construction permits will be obtained and verified on site by DOE's Independent Engineer	12	4
8.0	Final Optimization of Operating Parameters	Milestone	M8	Operations-Performance Test Completed.	Recipient will conduct triplicate reproduction of data for a minimum of 400 hours. All data will be provided to DOE. DOE will be on site for at least one run.	13	5
9.0	Commission and Start-up	Milestone	M9	Final Verification / Permit Decision Rendered / Issuance of Certificate of Occupancy.	DOE's Independent Engineer will verify mechanical completion is reached as defined in Recipient's construction and commissioning plan.	14	5
[redacted]		Go/No-Go Decision Point	Go/No-Go # 2	Commission and Start-up.	Mechanical completion verified. DOE's Independent Engineer will verify mechanical completion is reached as defined in applicant's	14	5

[redacted]					construction and commission plan.		
10.0	Commission and Start-up	Milestone	M10	Final Verification / Permit Decision Rendered / Issuance of Certificate of Occupancy.	Recipient provides summary reports as defined in deliverables requirements. DOE and DOE's Independent Engineer randomly sample data logs at Recipient site.	17	6
[redacted]		Go/No-Go Decision Point	Go/No-Go # 3	Final Economic and Commercial Validation	CD-4 Start of Operational Approval - Initiate Shakedown (DOE Core). DOE reviews project reports, financial reports, and Independent Engineer reports to make a go/no go decision for operations.	20	7
10.0	Final Deliverable	Milestone	M11	Final Report Delivered to DOE	After 27 months of operation, Recipient provides final report which includes updated economic models, life cycle analysis, and plant performance (inputs, outputs, yields, etc.) as defined in the deliverable requirements	27	9

6. Project Management Approach

The Project Coordinator, Johnny Lee, has the overall authority and responsibility for managing and executing this project according to this Project Plan and its Subsidiary Management Plans. The project team will consist of personnel from Clean Green Hydrogen Power, Inc., the research group, quality control/assurance group, technical writing group, and testing group, and personnel Green Earth

Management, LLC, wood processing group and accounting group. The Project Coordinator will work with all resources to perform project planning. All project and subsidiary management plans will be reviewed and approved by Clean Green Hydrogen Power, Inc. Any delegation of approval authority to the Project Coordinator should be done in writing and be signed by the project coordinator. The project team will be a matrix in that team members from each organization continue to report to their organizational management throughout the duration of the project. The Project Coordinator is responsible for communicating with organizational managers on the progress and performance of each project resource

a. *Communications Management Plan*

This Communications Management Plan sets the communications framework for this project. It will serve as a guide for communications throughout the life of the project and will be updated as communication requirements change. This plan identifies and defines the roles of the project team members as they pertain to communications. It also includes a communications matrix which maps the communication requirements of this project, and communication conduct for meetings and other forms of communication. A project team directory is also included to provide contact information for all stakeholders directly involved in the project. The Project Coordinator will take the lead role in ensuring effective communications on this project. The communications requirements are documented in the Communications Matrix below. The Communications Matrix will be used as the guide for what information to communicate, who is to do the communicating, when to communicate it, and to whom to communicate.

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable	Owner
Weekly Status Report	Email summary of project status	Weekly	Email	Project Sponsor, Team and Stakeholders	Status Report	Project Coordinator
Weekly Project Team Meeting	Meeting to review action register and status	Weekly	In Person	Project Team	Updated Action Register	Project Coordinator
Project Monthly Review (PMR)	Present metrics and status to team and sponsor	Monthly	In Person	Project Sponsor, Team, and Stakeholders	Status and Metric Presentation	Project Coordinator
Project Gate Reviews	Present closeout of project phases and kickoff next phase	As Needed	In Person	Project Sponsor, Team and Stakeholders	Phase completion report and phase kickoff	Project Coordinator

Technical Design Review	Review of any technical designs or work associated with the project	As Needed	In Person	Project Team	Technical Design Package	Project Coordinator

b. Communications Conduct

Meetings: The Project Coordinator will distribute a meeting agenda at least 2 days prior to any scheduled meeting and all participants are expected to review the agenda prior to the meeting. During all project meetings, the timekeeper will ensure that the group adheres to the times stated in the agenda and the recorder will take all notes for distribution to the team upon completion of the meeting. It is imperative that all participants arrive to each meeting on time and all cell phones should be turned off or set to vibrate mode to minimize distractions. Meeting minutes will be distributed no later than 24 hours after each meeting is completed.

Email: All email pertaining to this project should be professional, free of errors, and provide brief communication. Email should be distributed to the correct project participants in accordance with the communication matrix above based on its content. All attachments should be in one of the organization's standard software suite programs and adhere to established company formats. If the email is to bring an issue forward then it should discuss what the issue is, provide a brief background on the issue, and provide a recommendation to correct the issue. The Project Coordinator should be included on any email pertaining to this Project.

Informal Communications: While informal communication is a part of every project and is necessary for successful project completion, any issues, concerns, or updates that arise from informal discussion between team members must be communicated to the Project Coordinator so the appropriate action may be taken.

c. Cost Management Plan

The Project Coordinator will be responsible for managing and reporting on the project's cost throughout the duration of the project. The Project Coordinator will present and review the project's cost performance during the monthly project status meeting. Using earned value calculations, the Project Coordinator is responsible for accounting for cost deviations and presenting the Project Sponsor with options for getting the project back on budget. All budget authority and decisions, to include budget changes, reside with the Project Sponsor. For this Project, control accounts will be created at the fourth level of the WBS which is where all costs and performance will be managed and tracked. Financial performance of this project will be measured through earned value calculations pertaining to the project's cost accounts. Work started on work packages will grant that work package with 50% credit; whereas, the remaining 50% is credited upon completion of all work defined in that work package. Costs may be rounded to the nearest dollar and work hours rounded to the nearest whole hour.

Cost and Schedule Performance Index (CPI and SPI respectively) will be reported on a monthly basis by the Project Coordinator to the Project Sponsor. Variances of 10% or +/- 0.1 in the cost and schedule performance indexes will change the status of the cost to yellow or cautionary. These will be reported and if it's determined that there is no or minimal impact on the project's cost or schedule baseline then there may be no action required. Cost variances of 20%, or +/- 0.2 in the cost and schedule performance indexes will change the status of the cost to red or critical. These will be reported and require corrective action from the Project Coordinator in order to bring the cost and/or schedule performance indexes back in line with the allowable variance. Any corrective actions will require a project change request and be must approved by the CCB before it can be implemented.

Earned value calculations will be compiled by the Project Coordinator and reported at the monthly project status meeting. If there are indications that these values will approach or reach the critical stage before a subsequent meeting, the Project Coordinator will communicate this to the Project Sponsor immediately.

d. Procurement Management Plan

The Project Coordinator will provide oversight and management for all procurement activities under this project. The Project Coordinator is authorized to approve all procurement actions up to $50,000. Any procurement actions exceeding this amount must be approved by the Project Sponsor.

While this project requires minimal or no procurement, in the event procurement is required, the Project Coordinator will work with the project team to identify all items or services to be procured for the successful completion of the project. The contracts and purchasing groups will review the procurement actions, determine whether it is advantageous to make or buy the items or resource required services internally, and begin the vendor selection, purchasing and the contracting process.

In the event a procurement becomes necessary; the Project Coordinator will be responsible for management any selected vendor or external resource. The Project Coordinator will also measure performance as it relates to the vendor providing necessary goods and/or services and communicate this to the purchasing and contracts groups.

e. Quality Management Plan

All members of the project team will play a role in quality management. It is imperative that the team ensures that work is completed at an adequate level of quality from individual work packages to the final project deliverable. The following are the quality roles and responsibilities for the project:

The Project Sponsor is responsible for approving all quality standards for the project. The Project Sponsor will review all project tasks and deliverables to ensure compliance with established and approved quality standards. Additionally, the Project Sponsor will sign off on the final acceptance of the project deliverable.

The Project Coordinator is responsible for quality management throughout the duration of the project. The Project Coordinator is responsible for implementing the Quality Management Plan and ensuring all tasks, processes, and documentation are compliant with the plan. The Project Coordinator will work with the project's quality specialists to establish acceptable quality standards. The Project Coordinator is also responsible for communicating and tracking all quality standards to the project team and stakeholders.

The Quality Specialists are responsible for working with the Project Coordinator to develop and implement the Quality Management Plan. Quality Specialists will recommend tools and methodologies for tracking quality and standards to establish acceptable quality levels. The Quality Specialists will create and maintain Quality Control and Assurance Logs throughout the project.

The remaining member of the project team, as well as the stakeholders will be responsible for assisting the Project Coordinator and Quality Specialists in the establishment of acceptable quality standards. They will also work to ensure that all quality standards are met and communicate any concerns regarding quality to the Project Coordinator.

Quality control for the project will utilize tools and methodologies for ensuring that all project deliverables comply with approved quality standards. To meet deliverable requirements and expectations, we must implement a formal process in which quality standards are measured and accepted. The Project Coordinator will ensure all quality standards and quality control activities are met throughout the project. The Quality Specialists will assist the Project Coordinator in verifying that all quality standards are met for each deliverable. If any changes are proposed and approved by the Project Sponsor, the Project Coordinator is responsible for communicating the changes to the project team and updating all project plans and documentation.

Quality assurance for the project will ensure that all processes used in the completion of the project meet acceptable quality standards. These process standards are in place to maximize project efficiency and minimize waste. For each process used throughout the project, the Project Coordinator will track and measure quality against the approved standards with the assistance of the Quality Specialists and ensure all quality standards are met. If any changes are proposed and approved by the Project Sponsor and CCB, the Project Coordinator is responsible for communicating the changes to the project team and updating all project plans and documentation.

f. Risk Management Plan

The approach for managing risks for the project includes a methodical process by which the project team identifies, scores, and ranks the various risks. Every effort will be made to proactively identify risks ahead of time in order to implement a mitigation strategy from the project's onset. The most likely and highest impact risks were added to the project schedule to ensure that the assigned risk managers take the necessary steps to implement the mitigation response at the appropriate time during the schedule. Risk managers will provide status updates on their assigned risks in the bi-weekly project team meetings, but only when the meetings include their risk's planned timeframe.

Upon the completion of the project, during the closing process, the Project Coordinator will analyze each risk as well as the risk management process. Based on this analysis, the Project Coordinator will identify any improvements that can be made to the risk management process for future projects. These improvements will be captured as part of the lessons learned knowledge base.

g. Staffing Management Plan

The project will consist of a matrix structure with support from various internal organizations. All work will be performed internally. Staffing requirements for the Project include the following:

- Project Executive (1 position) – responsible for all execution for the project. The Project Executive is responsible for Oversees operations of organization, implements plans, manages human resources of organization and manages financial and physical resources.
- Project Coordinator (1 position) – responsible for all management for the project. The Project Coordinator is responsible for planning, creating, and/or managing all work activities, variances, tracking, reporting, communication, performance evaluations, staffing, and internal coordination with functional managers.
- Senior Engineer (1 position) – responsible for oversight of all engineering and design tasks for the projects well as ensuring functionality is compliant with quality standards. Responsible for working with the Project Coordinator to create work packages, manage risk, manage schedule, identify requirements, and create reports. The Senior Engineer will be managed by the Project Executive who will provide performance feedback to the functional manager.
- Computer Engineer (1 position) – responsible for coding and programming for the project. All coding and programming tasks will be reviewed by the Computer Engineer prior to implementation. Responsibilities also include assisting with risk identification, determining

impacts of change requests, and status reporting. The Computer Engineer will be managed by the Project Executive and feedback will be provided to the functional manager for performance evaluations by the Project Executive.

- Supervisor (1 position) – responsible for assisting the Project Coordinator in creating quality control and assurance standards. The Senior Quality Specialist is also responsible for maintaining quality control and assurance logs throughout the project. The Supervisor will be managed by the Project Executive who will also provide feedback to the functional manager for performance evaluations.
- Process Engineer (1 position) – responsible for assisting the Project Executive and Supervisor in creating and tracking quality control and assurance standards. The Process Engineer will have primary responsibility for compiling quality reporting and metrics for the Project Executive to communicate. The Process Engineer will be managed by the Project Executive who will provide feedback, along with the Supervisor to the functional manager for performance evaluations.
- Electrical Engineer (1 position) – responsible for Evaluates electrical systems, products, components, and applications by designing and conducting research programs; applying knowledge of electricity and materials. Confirms system's and components' capabilities by designing testing methods; testing properties. The Electrical Engineer will be managed by the Project Executive who will also provide feedback to the functional manager for performance evaluations.
- Chemical Engineer (1 position) – responsible for helping establish testing specifications for the project with the assistance of the Project Coordinator and Engineers. Responsible for ensuring all testing is complete and documented in accordance with ISO standards. Responsible for ensuring all testing resources are coordinated. The Chemical Engineer will be managed by the Project Executive who will also provide feedback to the functional manager for performance evaluations.
- Biologist (1 position) - responsible for helping establish testing specifications for the project with the assistance of the Project Executive and Supervisor. Responsible for ensuring all testing is complete and documented in accordance with ISO standards. Responsible for ensuring all testing resources are coordinated. The Biologist will be managed by the Project Executive who will also provide feedback to the functional manager for performance evaluations.
- Mechanical Technician (3 positions) - responsible for troubleshooting, technical procedures, and safety. Responsibilities include maintenance, troubleshooting, and repair of all mechanical powered equipment. The Mechanical Technician will be managed by the Supervisor who will also provide feedback to the functional manager for performance evaluations.

h. Market Transformation Plan

Market Transformation takes a long-term view of a specific but complete market and the opportunities that exist within that market to increase efficiency. The efficiency opportunities might be accomplished through a range of voluntary market interventions (see below) from the introduction of new and emerging technologies or practices to involuntary measures such as a change in codes and standards.

This process of Market Transformation is not complete when a single technology or practice achieves a specific market share benchmark. Rather, transformation can be considered complete when all of the achievable efficiency opportunities have been adopted into the market or the remaining market barriers are insurmountable.

This process consists of several distinct phases that are repeated as needed as the market moves upward towards achieving full potential. These phases include:

1. *Identify Market Barriers*: The first phase is to identify specific market barriers to adoption of energy-efficient products, services and practices. It includes the evaluation of high-potential technologies and examines impediments that may include product availability, quality or price; lack of financing; insufficient technical capability or tools; and low awareness of business benefits.
2. *Assess Opportunities and Leverage Points*: The next phase in the process is to develop a comprehensive strategic plan to address the identified market barriers and exploit opportunities in order to achieve the full market potential for efficiency. This step includes the identification of potential market partners that can influence supply and demand of market ready, energy-efficient products, services or practices.
3. *Develop and Implement Market Interventions*: This step of the process moves to developing comprehensive strategies to overcome identified market barriers through opportunities and leverage points. It also involves developing an implementation plan that identifies specific market interventions and appropriate market actors to implement these activities.
4. *Evaluate and Adapt Initiatives*: As the implementation process moves forward, the components of the project and overall strategy need to be assessed and evaluated and adjusted or revised as indicated by the market data. Because markets are dynamic, it is critical to approach the process of Market Transformation with tools that allow for adaptive management of the implementation process.

7. The Technical Qualifications and Resources

Applicant is an agricultural products company that produces mulch, biochar, and liquid fertilizer from yard waste. Since 2010, the company has successfully converted nearly 1 million tons of yard waste into agricultural products. The company is a subsidiary of Green Earth Management, LLC, the largest green waste processing facility in Santa Clara Valley, California.

While researching gasification technology to produce electricity in 2012, the company realized there was very little economic value in electricity or oil production from biomass, so they sought to turn their waste ash into biochar, and has since sold over 4,500 tons of biochar and produced over 323 MWh of electricity. The process produces 20 kW of electricity per hour which is used on-site to run machinery and equipment.

a. Project Team

Jim Piazzo, CEO and owner of CGHPower. Jim has 25+ years of tree trimming and 6+ years of wood recycling experience. Jim built the applicant’s first wood waste gasification demonstration unit in 2012. Today CGHPower produces biochar for sale and electricity for on-site use.

Brian Normanly, Mechanical Engineer. In 1988, Brian led the research and development Laboratory team at Raychem Corporation where he perform mechanical testing on shape memory metals

(Nitnol) using a computer controlled servo hydraulic MTS test system. Brian later joined Survival Research Labs where he worked for 19 years Brian left Survival Research Labs to work at Carbonframes, a carbon fiber bicycle company startup. In 2012 he joined All Power Labs, in Berekely, California working on gasification technology. After leaving All Power Labs Brian joined CGHPower and have been instrumental in developing the gasification technology at CGHPower. Brian has 28+ years of experience in the carbon fiber and gasification technology.

Johnny Lee, Ph.D. Bio- Engineer. Johnny studied Biology at San Diego State University from 2002-2005, where he worked at an AIDS research lab investagating viruses that exhibited similar characteristics to AIDS. Johnny joined Green Earth Management, LLC in 2012. Two years later Johnny and Jim Piazzo founded CGHPower in San Jose, California. Johnny has 12+ years of experience in biotech and advanced gasification technology.

Hugo Lake, Ph.D Mechanical Engineer – Hugo studied Mechanical Engineering at Rensselaer Polytechnic Institute in 1971. In 1974 Hugo received his post doctorate degree in Oceanography at the University of Washington. Hugo started working at Taiwan Petroleum Corporation Kaohsiung Refinery in 1974, before joining Southern California Edison in 1975, only to leave the next year to join California Public Utilities Commission (CPUC) for 32 years. In 2012 Hugo join CGHPower to assist in gasification engineering, and issues associated with state power regulation and public outreach. Hugo has 35+ years of experience in the government and energy sector.

Thomas Omstead, Ph. D. Thin Film Process, Design, and Integration Engineer. Thomas worked in the semiconductor, solar, and GMR industries on ALD, CVD, PECVD, and metal deposition. Thomas worked as a design engineer and design group leader using design projects include rotating magnetrons (metal deposition), PECVD Systems, gas manifolds, and vacuum chambers. Thomas has over 20 U.S. Patents and 20 Publications including 7 filed in 2014 (for Applied Materials). Thomas is the Senior Engineer responsible for Graphene research. Thomas has 15+ years of experience as a thin film process, design, and integration engineer.

Johnny Yin Biologist has 14 years in the biotechnology industry, with extensive and broad experience in drug discovery and development, in particular biochemical assay development for functional characterization of antibodies for therapy and diagnostics. Johnny was the Principal Associate in the Antibody-drug conjugate (ADC) Discovery group at Astellas Pharma U.S. Johnny joined CGHPower in 2015 and has been working on plant health and nutrients.

Hung Nguyen, Mechanical Engineer. Hung studied engineering at the University of Bach Khoa in Vietnam. Hung leads the design and mechangical engineering team at CGHPower. Hung emigrated to the United States in 1982 and has worked as an mechanical engineer for the last 34+ years. Hung has 34+ years of experience in the mechanical engineering industry.

Jose Luis Mendoza Quiroz – Jose studied agricultural engineering at the University of Guanajuato in Mexico from 2007 to 2011. Jose joined CGHPower in 2012 and is the senior technician at the facility. Jose also leads the advanced organic fertilizer division of CGHPower.

Henry Yin – Former California Commissioner for Economic Development – President of the California Green Technology Center. Has worked with our company for many years on environmental related issues.

Christina Magerkurth - Christina M. Magerkurth, P.E.. Ms. Magerkurth is a Senior Environmental Engineer with First Environment, Inc. and has worked in the environmental field for over

24 years. She works closely with our company on environmental permitting and carbon issurance program.

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➢ The 55 uses of biochar

The cascaded use of biochar in animal farming

1. Silage agent, 2. Feed additive / supplement, 3. Litter additive, 4. Slurry treatment, 5. Manure composting, 6. Water treatment in fish farming

At present some 90% of the biochar used in Europe goes into animal farming. Different to its application to fields, a farmer will notice its effects within a few days. Whether used in feeding, litter or in slurry treatment, a farmer will quickly notice less smell. Used as a feed supplement, the incidence of diarrhea rapidly decreases, feed intake is improved, allergies disappear, and the animals become calmer. In Germany, researchers conducted a controlled experiment in a dairy that was experiencing a number of common health problems: reduced performance, movement disorder, fertility disorders, inflammation of the urinary bladder, viscous salivas, and diarrhea. Animals were fed different combinations of charcoal, sauerkraut juice or humic acids over periods of 4 to 6 weeks. Experimenters found that oral application of charcoal (from 200 to 400 g/day), sauerkraut juice and humic acids influenced the antibody levels to C. botulinum, indicating reduced gastrointestinal neurotoxin burden. They found that when the feed supplements were ended, antibody levels increased, indicating that regular feeding of charcoal and other supplements had a tonic effect on cow health. Visit the Ithaka

Use as a soil conditioner

7. Carbon fertilizer, 8. Compost additive, 9. Substitute for peat in potting soil, 10. Plant protection, 11. Compensatory fertilizer for trace elements

In certain poor soils (mainly in the tropics), positive effects on soil fertility were seen when applying untreated biochar. These include the higher capacity of the soil to store water, aeration of the soil and the release of nutrients through raising the soil's pH-value. In temperate climates, soils tend to have humus content of over 1.5%, meaning that such effects only play a secondary role. Indeed, fresh biochar may adsorb nutrients in the soil, causing – at least in the short and medium term – a negative effect on plant growth. These

are the reasons why in temperate climates biochar should only be used when first loaded with nutrients and when the char surfaces have been activated through microbial oxidation. The best method of loading nutrients is to co-compost the char. This involves adding 10–30% biochar (by volume) to the biomass to be composted. Co-composting improves both the biochar and the compost. The resulting compost can be used as a highly efficient substitute for peat in potting soil, greenhouses, nurseries and other special cultures.

Because biochar serves as a carrier for plant nutrients, you can produce organic carbon-based fertilizers by mixing biochar with such organic waste as wool, molasses, ash, slurry and pomace. These are at least as efficient as conventional fertilizers, and have the advantage of not having the well-known adverse effects on the ecosystem. Such fertilizers prevent the leaching of nutrients, a negative aspect of conventional fertilizers. The nutrients are available as and when the plants need them. Through the stimulation of microbial symbiosis, the plant takes up the nutrients stored in the porous carbon structure and on it's surfaces.

The thermal process that produces biochar is called pyrolysis (from the Greek, "pyro," meaning fire and lysis," meaning separation). During pyrolysis, the crucial trace elements found in plants (over 50 metals) become part of the carbon structure, thereby preventing them from being leached out while making them available to plants via root exudates and microbial symbiosis. This feature can be used specifically when certain trace elements are missing in a certain regional soil or in soil-free intensive cultures such as "Dutch tomatoes".

A range of organic chemicals are produced during pyrolysis. Some of these remain stuck to the pores and surfaces of the biochar and may have a role in stimulating a plant's internal immune system, thereby increasing its resistance to pathogens. The effect on plant defense mechanisms was mainly observed when using low temperature biochars (pyrolysed at 350° to 450°C). This potential use is, however, only just now being developed and still requires a lot of research effort.

Use in the building sector

12. Insulation, 13. Air decontamination, 14. Decontamination of earth foundations, 15. Humidity regulation, 16. Protection against electromagnetic radiation ("electrosmog")

Two of biochar's properties are its extremely low thermal conductivity and its ability to absorb water up to 6 times its weight. These properties mean that biochar is just the right material for insulating buildings and regulating humidity. In combination with clay, but also with lime and cement mortar, biochar can be added to clay at a ratio of up to 50% and replace sand in lime and cement mortars. This creates indoor plasters with excellent insulation and breathing properties, able to maintain humidity levels in a room at 45–70% in both summer and winter. This in turn prevents not just dry air, which can lead to respiratory disorders and allergies, but also dampness and air condensing on the walls, which can lead to mold developing. You can read about the Ithaka Institute's biochar-plaster wine cellar and seminar rooms in the Ithaka Journal. Such biochar-mud plaster adsorbs smells and toxins, a property not just benefiting smokers. Biochar-mud plasters can improve working conditions in libraries, schools, warehouses, factories and agricultural buildings.

Biochar is an efficient adsorber of electromagnetic radiation, meaning that biochar-mud plaster can prevent "electrosmog".

Biochar can also be applied to the outside walls of a building by jet-spray technique mixing it with lime. Applied at thicknesses of up to 20 cm, it is a substitute for Styrofoam insulation. Houses insulated this way become carbon sinks, while at the same time having a more healthy indoor climate. Should such a house be demolished at a later date, the biochar-mud or biochar-lime plaster can be recycled as a valuable compost additive.

Decontamination

17. Soil additive for soil remediation – for use in particular on former mine-works, military bases and landfill sites).

18. Soil substrates – Highly adsorbing, plantable soil substrates for use in cleaning wastewater; in particular urban wastewater contaminated by heavy metals.

19. A barrier preventing pesticides getting into surface water – berms around fields and ponds can be equipped with 30-50 cm deep barriers made of biochar for filtering out pesticides.

20. Treating pond and lake water – biochar is good for adsorbing pesticides and fertilizers, as well as for improving water aeration.

Biogas production

21. Biomass additive, 22. Biogas slurry treatment

Initial tests show that, through adding biochar to a fermenter's biomass (especially heterogeneous biomasses), the methane and hydrogen yield is increased, while at the same time decreasing CO_2 and ammonia emissions. Through treating biogas slurry with lacto-ferments and biochar, nutrients are better stored and emissions prevented.

The treatment of wastewater

23. Active carbon filter, 24. Pre-rinsing additive, 25. Soil substrate for organic plant beds, 26. Composting toilets

The treatment of drinking water

27. Micro-filters, 28. Macro-filters in developing countries

Other industrial uses

Exhaust filters (29. Controlling emissions, 30. Room air filters)

Industrial materials (31. carbon fibers, 32. plastics)

Electronics (33. semiconductors, 34. batteries)

Metallurgy (35. metal reduction)

Cosmetics (36. soaps, 37. skin-cream, 38. therapeutic bath additives)

Paints and coloring (39. food colorants, 40. industrial paints)

Energy production (41. pellets, 42. substitute for lignite)

Medicines

(43. detoxification, 44. carrier for active pharmaceutical ingredients, 45. Cataplasm for insect bites, abscesses, eczema…)

There are several hundred other medical uses proven in its efficiency for many centuries. Somewhat forgotten during the last 40 years, more and more people and doctors rediscover it's efficiency to treat a whole range of symptoms. Have a look to: www.CharcoalRemedies.com

Textiles

46. Fabric additive for functional underwear, 47. Thermal insulation for functional clothing, 48. Deodorant for shoe soles

In Japan and China bamboo-based biochars are already being woven into textiles to gain better thermal and breathing properties and to reduce the development of odors through sweat. The same aim is pursued through the inclusion of biochar in shoe soles and socks.

Wellness

49. Filling for mattresses, 50. filling for pillows

Biochar adsorbs perspiration and odors, shields against electromagnetic radiation (electrosmog), and removes negative ions from the skin. Moreover, it acts as a thermal insulator reflecting heat, thereby enabling comfortable sleep without any heat build-up in summer. In Japan, pillows have been filled with biochar for a long time. This is supposed to prevent insomnia and neck tension.

51. Shield against electromagnetic radiation

Biochar can be used in microwave ovens, television sets, power supplies, computers, power sockets, etc. to shield against electromagnetic radiation. This property can also be used in functional clothing as protection for parts of the body particularly sensitive to radiation.

52. Food Conservation

Put a small bowl of biochar into the fridge (or small linen bags with biochar) and it will not only absorb bad odours but also Ethylen which will retard the post ripening of fruits and vegetables prolonging thus their conservation time. As the biochar takes-up humidity, the risk of mould is diminished. In food packaging the conservation time can be increased through the addition of biochar either in the packaging material or as an additive in small tea bags. For the long-term storage of potatoes, carrots, cabbage, apples, and other winter vegetables and fruits, to dig them into biochar can increase storage time for several months.

All of the proposed biochar uses except nos. 35, 41, 42 are carbon sinks. After its initial or cascading use, the biochar can be recycled as a soil conditioner. Fully depreciated when finally returned to the soil, the black carbon will slowly build up in the soil – and over a few generations the soil's biochar content could easily reach 50 to 100 tons per hectare, as it's the case in the ancient Terra Preta soils.

We have listed 52 possible uses of biochar. But the title refers to 55 uses.... This is to be seen as an indication of our intention to keep on adding to the list over the coming years, as experience builds up. We can also be sure that the author has missed out a number of uses already available today (the first version of this article published in the Ithaka Journal only contained 44 possible uses).

There

Clean Green Hydrogen Power,LLC

650 King Row San Jose, CA

Estimated Equipment

Quantity	Manufacturer	Description	Part Number	Purchase Company	Unit Price	Amount
8	Bloom Energy	Fuel cells	N/A	Bloom Energy	$800,000.00	$6,400,000.00
8	Thermex Thermatron, LP	100 kW Microwave Generator	Model TM100 MW	Bloom Energy	$116,152.00	$929,216.00
8	Thermex Thermatron, LP	E-plane 90 degree bends	a	Bloom Energy	$522.00	$4,176.00
8	Thermex Thermatron, LP	H-plane 90 degree bends	b	Bloom Energy	$522.00	$4,176.00
8	Thermex Thermatron, LP	Flanged straight wave guide less than 2' long	c	Bloom Energy	$342.00	$3,420.00
8	Thermex Thermatron, LP	Manual 3-Stub tuner	d	Bloom Energy	$4,559.57	$45,595.70
1	Kubota	Compact Track Loader	SVL95 BO	Kubota	$76,320.09	$76,320.09
1	Kubota	Forklift	NA	Kubota	$18,421.09	$18,421.09
1	Micromeritics	Surface Area Analyzer	Micromeritics	Micromeritics	$50,000.00	$50,000.00
1	Generic lab supplies	Laboratory Supplies	Micromeritics	Micromeritics	$10,000.00	$10,000.00
1	Generator	Laboratory Magnetron Generator	Generac Guardian™ 22kW Standby Generator System	enerator/p70169.html?c	$4,797.00	$4,797.00
1	Generator	Electrical Frequency Analyzer and Generator	NA	enerator/p70169.html?c	$250,000.00	$250,000.00
1	Terence J. Szewczyk	TS/Civil Engineering, Inc	NA	NA	$25,000.00	$25,000.00
1	PG&E Transformer	PG&E	PG&E Notification# 114150925	NA	$700,000.00	$700,000.00
100	100 Floodlights	lighting	vww.lightingever.com/checkc	NA	$19,668.00	$19,668.00
10	Light Pole	14' Tall x 4.0" OD x 0.125" Thick, Round Tapered Aluminum, Anchor Base Light Pole	light poles plus	NA	$23,166.00	$23,166.00
1	Server	computer	Dell	NA	$12,000.00	$12,000.00
3	Computers	computer	Dell	NA		$8,000.00
	Employees	Staff	CGHpower, LLC	N/A	$200,000.00	$200,000.00
1	Bond	Bond Number PB11509602525	UTILITY BOND	N/A	$3,000.00	$3,000.00
1	sprinkler system	fire sprinkler system	NA	NA	$17,000.00	$16,000.00
1	**Property**	190 Church Ave Gilroy, CA 95020	NA	NA	$2,888,888.00	$2,888,888.00

$12,391,843.88

CGH POWER

New Power Generation

EXECUTIVE SUMMARY

- **Municipal Solid Waste Problem**

Around 70.6 million tons of urban wood waste was generated in the U.S. in 2010, including 48 percent from municipal solid waste and 52 percent from construction and demolition (C&D). Several years ago, the Construction Materials Recycling Association estimated a further 29 million tons of waste per year.

- **Let's Revolutionize Our Soil Waste Into Valuable Products**

Jim Piazzo is the Chief Executive Officer of Clean Green Hydrogen Power, Inc., with his help, his engineering team developed patented equipment which will be added to a thermal microwave. The use of this CGHP equipment will reduce the current solid waste problem and will turn it into a positive product for our planet, and our children's future. This current technology developed by CGHP has a 97% efficient rate which is significantly more efficient than solar power (only 20% efficient).

Mr. Piazzo design is ready to produce the much-needed organic materials such as bio-fuels, biochar, carbon, graphene, and best of all, this specialized equipment can produce electricity on our current electrical grids removing our carbon foot in the process.

- **CGHP- Key Advantages**

1. Electric efficiency is 97% using thermal microwaves.
2. Tax fee money from cap and trade.
3. Reduce our carbon footprint on the planet.
4. Focusing on recycling waste from our transfer stations to remove the soild waste problem and expedit it into valuable materials.

<u>Examples of Biomass Supply & Products</u>

- Biochar has over 55 multiple uses including farming industry, construction industry and skin products.
- Organic compost, a completely organic-certified product.
- Activated carbon to remove impurities from water.
- Graphene with a higher surface area 186-320 m 2/g.
- Bio-Oil is currently used in San Francisco, California, to fuel ships.
- Electricity 5MW-CGHP would be its own service provider

- **Revenue Forecast Per Day**

Products	25 tons=1semi-truck	Per Day	Amount
Biochar	**$645,000.00**	**8**	**$5,160,000.00**
Activated Carbon	**$297,500.00**	**1**	**$297,500.00**
Bio-Oil	**$31,500.00**	**1**	**$31,500.00**
Graphene	**$50,000,000.00**	**1**	**$50,000,000.00**
Electricity 5 MW	**$30,000.00**	**8**	**$240,000.00**
Cap& Trade-Tax-Fee	**$52,054.00**	**1**	**$52,054.00**
Note: only one product to be manufactured per day.			**$107,783,000.00**

- **Operational Plan**
  Phase 1: Site Development
  Phase 2: Construction, Installation & System Coordination
  Phase 3: Legal Environment
  Phase 4: Start Production
- **Organization**
  For the start-up period, the charter members meet at least once per month to discuss the current status and plan for 'next steps'. The Managing Member is the main point of contact for potential funders, suppliers, agencies, customers, etc.; but all developments are forwarded to all of the members for review, discussion, and decision making. During construction and installation work, the Managing Member will supervise and monitor all contracts with engineering and contractors. As the CGHP facility is being constructed, CGHP will hire an on-site manager for all operations, in addition to two experienced engineers to learn about the equipment and system as it is commissioned and integrated. Once fully perational, the CGHP facility should maintain twenty (20) full-time positions.

  Board of charter members, general manager, business implementation, faculty deployment, business management, sales/marketing, operations, human resources and repair/maintenance.

CGH POWER

New Power Generation

Clean Green Hydrogen Power Facility

Biomass Waste + Thermal Microwave + Patent Parts

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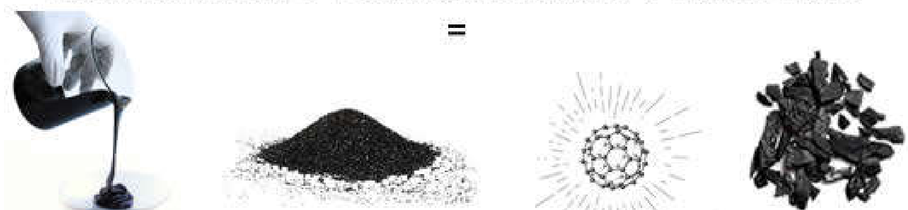
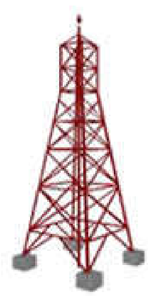


Bio-Oil Activated carbon Graphene Biochar

and electricity !



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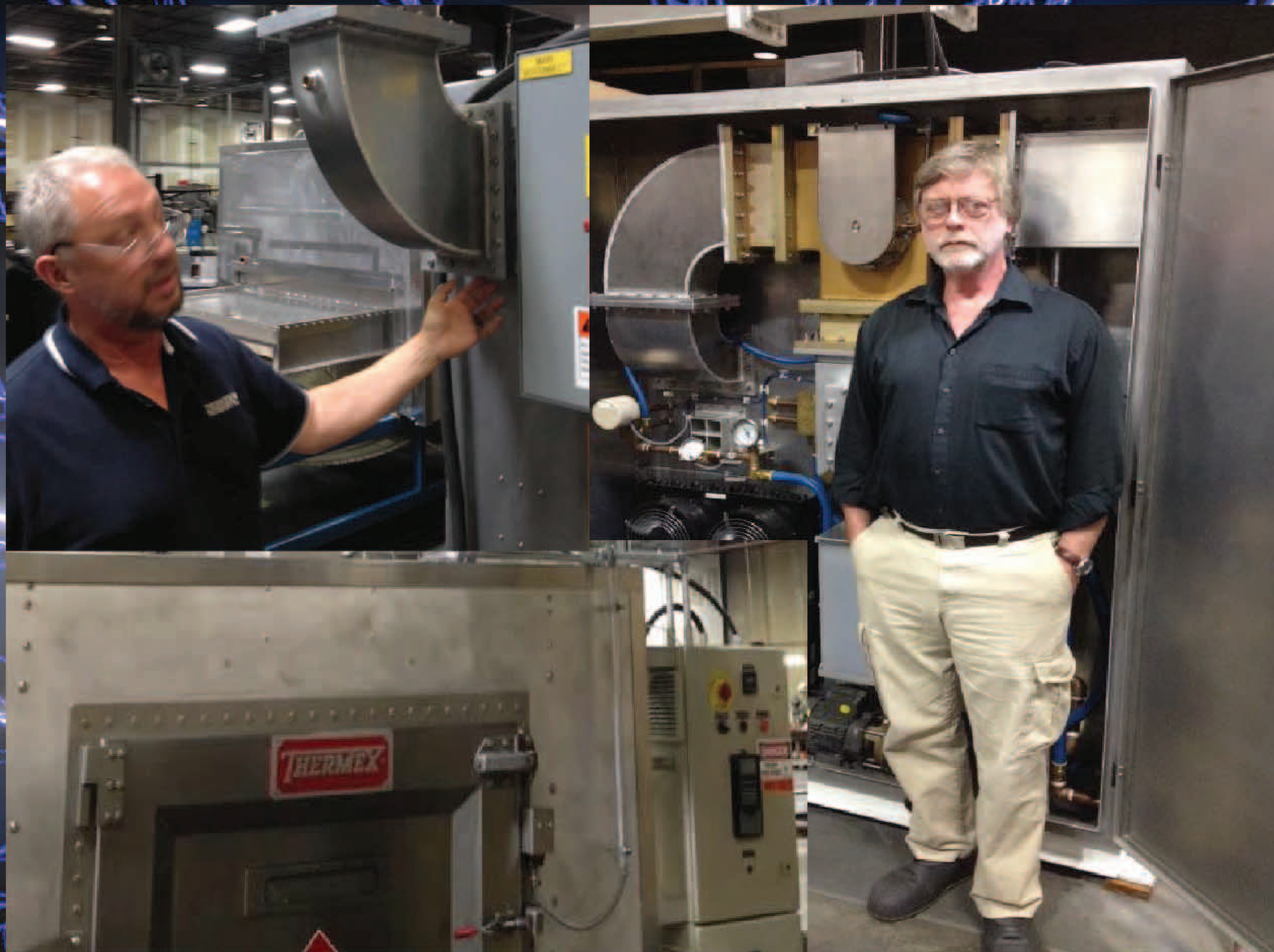

Clean Green Hydrogen Power, LLC

Graphene Carbon Electricity Biochar

the new power generation

Clean Green Hydrogen Power, LLC

Graphene Carbon Electricity Biochar

the new power generation