By © 2022 Lyno Sullivan and Carbonic LLC. Patent Pending. Portal Link URL is https://carbonic.sppx.io/ HINT: Use Document Outline

Executive Summary

Groundwater accounts for nearly 95 percent of U.S. fresh water resources. Pig farms supply Americans and American exporters with approximately 26 billion pounds of pork products annually. Pig farm manure lagoons are a known source of air and ground water pollution. A Minnesota entity, Carbonic LLC, seeks to sequester pork maure carbon into High Density Polyethylene (known as HDPE), an industrial plastic, used in everything from grocery bags and milk jugs to playground equipment and medical devices. With Carbonic LLC in the picture, new sustainable biomass options emerge for the community. Community pressure increases to use sustainable sourced plastic for housing, out buildings, and fencing. This pressure affects the building industry in general and the housing, farm, and out building industries in particular. The edible meat industry supply volume may increase as more small Carbonic LLC Tech enabled farms are built Imagine building more HDPE barns, thereby increasing a farmer's HDPE sales revenue. That's a Growth Plan! Other farmers will choose to raise beef and dairy cattle. Swine, bovine, and poultry barns. Add a layer to the Growth Plan!. All of the states raise livestock herds; add another layer of the Growth Plan! Slaughterhouses add a layer to the Growth Plan! Other livestock farms might choose to additionally or instead produce propane, electricity, and heat.

Farm **energy independence** changes **farm costs**. Distributed sequestering (sinking) of carbon in plastic is done at manure production locations. Many people and organizations share Carbonic LLC concerns for human caused CO2 being released into the atmosphere, instead of being sequestered.

The **meat processing industry** too from byproducts and waste. can be input to a $#ManureGasPlastic^{TM}$ apparatus where the animal remains are gasified too. The

bones end up in **bone char** which is great for the environment and for revenue. From the Carbonic LLC #ManureGasPlastic[™] (#MGP) solution.

How much does it cost to build a gasification plant?

Billions Over Budget, Kemper Facility Gasification Portion Is Suspended Jun 28, 2017 . . .Operations and start-up of the lignite gasification portion of the Kemper County Energy Facility, marred by exorbitant delays and cost overruns, will be suspended immediately, Mississippi Power announced on June 28. The Southern Co. subsidiary plans to continue running a combined cycle gas turbine (CCGT) plant that was completed as part of the **\$7.5 billion project** three years ago, pending the Mississippi Public Service Commission's (MPSC) decision on future operations.

We Must Use Right Sized Smaller Solutions

What is the Product?



The Carbonic LLC primary apparatus, process, and product costs **\$500K** plus **\$5K/mo** for maintenance and support. The #ManureGasPlastic[™] apparatus is the primary product of Carbonic LLC. Our patent pending technology turns a pig

manure problem into an income stream for the farmer. It transforms manure into plastic and at the same time locking up carbon inside the plastic for decades.

\$7.5 billion could have bought 15,000 #MGP units instead.

Who is the Customer?

The primary customers are selected from the Minnesota Pollution Control Agency (MPCA) spreadsheet of the **38,000 feedlot farms** in Minnesota. When it comes to data gathering, the experimental livestock group is pig farms. Chickens are next. What we learn from our **3,000 pig farms** outreach campaigns will be invaluable for other pig farms in counties and states experiencing livestock pollution problems. Large pig farm management companies advise their members on everything related to profitably raising hogs. Farmers will fairly consider purchasing the \$500,000 #ManureGasPlastic[™] apparatus based on the advice.



By informing their membership of the many benefits of our proposition, the large management companies strengthen the validity of being a member and may even

increase membership by word of mouth from happy farmers. Also, it cannot be overstated how important it is to **reduce** the amount of **carbon** that finds its way into the environment because the harmful effects of carbon buildup, especially in the **atmosphere**, are now well known and accepted as fact by many. Management companies will consider recommending #ManureGasPlasticTM to their readership.

Value Proposition for Each Pig Farm?

The key value proposition for each pig farm is the extra income from plastic sales each year. The primary consumer of the plastic would be the housing and building industry. Plastic is one of the safest and best ways to sequester carbon. Also of great value to the farmer, the associated problems with handling large amounts of manure disappear when the manure is gasified into syngas which, with the help of certain chemical catalysts, will create a form of plastic safe for human use. #ManureGasPlastic[™] units will lessen the use of lagoons and reduce the risk of manure getting into existing waterways with resulting disastrous pollution. #ManureGasPlastic[™] will also reduce problems associated with spreading pig manure on agricultural land.

Carbonic LLC Key Management Bio



Lyno Sullivan grew up in Montana. He graduated in 1972 from the University of Montana with a B.A. Economics degree and a B.S. Computer Science degree. He joined the Peace Corp and served 3 years in Kingston, Jamaica . In 1975 he returned from Jamaica to live 5 years in Colorado, 5 years in Vermont, 3 years in South Dakota, and the remaining years since 1987 he has lived in

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Lake Elmo, Stillwater and Woodbury. He retired in 2016 and wrote a book titled "Newland 2084", which explores a world where Cooperative Businesses are the primary business model. He has worked as an IP consultant for CoCreateX since 2017. Lyno registered the Carbonic LLC that is the subject of this 2022 Plan.

Carbonic LLC Formation

Carbonic LLC at noon on February 18, 2020. Carbonic LLC Limited Liability Company Jurisdiction: Minnesota Time Noon, February 18, 2020

Opportunity

#ManureGasPlastic[™] Solutions for Farmers Throughout Minnesota

In Minnesota, approximately 3,000 pig farms raise about 1,000 pigs that each produce about 10 pounds of manure per day. That's nearly 30,000,000 pounds of manure per day. Removing 90% water, leaves approximately 3,000,000 pounds which is about 750 tons of ash and 750 tons per day of carbon. Water is consumed in the process. Its oxygen forms carbon monoxide in the syngas along with hydrogen for the syngas supply.

Alternative: Large and Centralized

Large carbon gasification facilities cost in the millions of dollars with a capacity of **6 tons per hour** up to **60 tons** per hour. Such a behemoth carbon gasifier is sized to serve dozens average size farms operating at **6 tons per day** processing capacity. Such deployments would require the trailering or piping of manure from each of a **dozen or more farms** to a centralized location. This is costly, risky, and generally undesirable. Instead, Carbonic LLC, envisions right-sizing and deploying carbon gasification and HDPE production capabilities within #ManureGasPlasticTM shipping containers to buyers from among the 3,000 Minnesota pig farms.

Page 5

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Alternative: Right Sized and Distributed

Carbonic LLC seeks to **right-size** and **deploy** #ManureGasPlastic[™] carbon gasification and HDPE production capabilities within shipping containers for each of up to 3,000 farms in MN. The plastic produced, when sold on the open market, should gross each farmer approximately 750 pounds of HDPE per day, worth about \$250,000 per year, via the sale of the pig manure carbon sequestered in HDPE plastic. At a \$500,000 per unit cost plus \$5,000 per month, a farmer could pay for the capital investment within 3 years and then begin returning \$250,000 per year gross income in subsequent years.

An Optimization Question

Herein lies an optimization question: Is it cheaper and more efficient to create shipping container carbon gasification and HDPE production facilities for each and every average sized pig farm, many of which could be used in parallel for larger farms? Or, would the cost competitiveness of a larger farm with a larger facility, with the additional revenue of plastic sales be so much more profitable, that the pork industry could be further centralized?

A Minnesota, USACatalyst Connection

University of Minnesota Patent

Syngas from Renewable Biomass can be Refined into Liquid Fuel, Chemicals, or Fertilizer Agents

A patented **metal catalyst is** the only mechanism required for the conversion process from manure to syngas. The catalyst not only **prevents** the buildup of **char** on its surface but is easily scaled and also operable at atmospheric pressure. These properties make this technology especially applicable in **small scale applications** and in situations where a **small portable reactor system** containing the catalyst is implemented **near** renewable biomass sources. Such a **portable device** would eliminate the costs of transporting biomass to a centralized processing location. **High yields of syngas** can be further processed potential sources of renewable biomass fuels containing carbon and hydrogen include wood, agricultural crops, and animal wastes. The **feedstocks may be wet or dry**.

Page 6 © 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

BENEFITS OF THE BIOMASS TO SYNGAS GASIFICATION TECHNIQUE:

High conversion rates (>99%)
No solid carbon (char) formation
Fast reaction time (< 50 milliseconds)
Reduced biomass transportation costs
Compatible with multiple feedstocks including solid or liquid biomass
Heating is not required (autothermal)
Operates at atmospheric pressure
Researchers: Lanny D. Schmidt, PhD Professor, Chemical Engineering and
Materials Science, College of Science and Engineering
Paul Dauenhauer, PhD Associate Professor, Chemical Engineering and Materials

Science, College of Science and Engineering

The University of Minnesota developed and patented the intellectual property necessary for the idealized Carbonic LLC $\#MGP^{TM}$ solution. The UofMN Researchers (listed above) Chemical Engineering Faculty produced a chemical catalyst used to produce syngas from the pig manure, other manures, and other kinds of carbon based materials. The catalyst is now licensed by <u>https://www.enverdellc.com/</u>. Syngas is the intermediate gas used to produce HDPE plastic and other polymers. High Density Polyethylene (HDPE) is a among various thermoplastic polymers traditionally made from petroleum, which is the **Prior Art**. Renewable pig manure is the **New Art** of producing renewable plastics. HDPE is one of the most versatile industrial plastic materials around.

Livestock Market Growth Opportunity

The same basic principles apply to the meat industry in general including pork, beef, chicken, turkey and other meat and livestock species raised in herds and flocks of sufficient size to produce enough manure for #MGP operations. Mixing manures is possible. inclusions like carbon black enhance properties of HDPE by stopping Solar Energy degradation and adding new composite HDPE properties.

Continuous Flow System Needed

Pig farms deal in live animals that must be processed when they grow to the size meeting standards for the pork industry's processing equipment. Additionally, being that the pigs are live animals, in the event that the gasification sequestration equipment quits and takes a day off, the pigs cannot simply delay manure production and thereby create a backlog of manure to be processed. This could build up over time, overflow lagoons, and simply cause the pollution problems intended to be solved. The miniaturization, **right-sizing**, if you will. Carbon gasification and sequestration into HDPE creates a well fitted solution for small and average sized farms and large farms too.

Is This a Breakthrough Approach?

Carbonic LLC offers an initial carbon sequestration solution that turns pig manure into HDPE plastic. It is a process which sequesters the carbon when the polyethylene is produced. The carbon atoms of polyethylene are totally sunk when they reach the HDPE stage. This fact alone may be a **breakthrough idea**. It appears that nobody has assembled all of the pieces of the puzzle into an arrangement providing a big picture solution that makes sense front to back. The first target process breaks down into one pathway from manure feedstock input through the pyrolysis temperatures of up to ~ 800 °C, depending on catalysts and processes used to produce hydrogen gas and carbon monoxide gas, which are components of syngas. Some pyrolysis processes do not need catalysts.

How is ethane cracked?

This section distills some interesting information gathered from the internet. Author studied Chemistry in school and from his mentor Oliver. After 20 years of thinking and studying the solution underlying the #ManureGasPlastic[™] **Apparatus** and **Process** of the #ManureGasPlastic[™] **Solution**. The tough part is **cracking** ethane so that the polyethylene cracking catalysts like metallocene can do their business.

For example: https://patents.google.com/patent/WO2016069389A1/en

Conversion of methane and ethane to syngas and ethylene

An Ethane Cracker

An **ethane cracker** takes **ethane**, a component of natural gas found in abundance, and processes it—or 'cracks' it—into **ethylene**. It heats the ethane up so hot that it breaks apart the molecular bonds holding it together. The first stop in the processing of plastic from natural gas is the cracker plant. Crackers turn either naphtha, a crude oil-based product, or ethane, a natural gas liquid, into ethylene, a starting point for a variety of chemical products.

https://extension.psu.edu/how-plastic-is-made-from-natural-gas

Other Catalyst Pathways

There are numerous metallic and organic catalyst pathways that can be used to transform "manure gas" into "synthesis gas", which is known as "syngas". There exist catalyst pathways used to turn syngas into many different chemical products like gas fuels, liquid fuels, and various chemicals. For example, there exists a catalyst process that promotes "Shape-Selective Zeolites Promote **Ethylene Formation from Syngas** via a Ketene Intermediate". This study provides substantive evidence for a new type of syngas chemistry with ketene as the key reaction intermediate and enables **extraordinary ethylene selectivity** within the OX-ZEO catalyst framework. This catalyst pathway is one among the many pathways available for R&D exploration, experimentation, and embodiment.

https://onlinelibrary.wiley.com/doi/abs/10.1002/anie.201801397

Methane Catalyst Pathways

https://globalsyngas.org/syngas-technology/

Biomass Gasification includes a wide range of materials, including energy crops such as grasses, hemp, corn husks, wood pellets, lumbering and timbering wastes, yard wastes, construction and demolition waste, and biosolids (treated sewage sludge). Gasification converts biomass into syngas.

Pig Manure is Like Gold



The pig manure turns out to be **like gold** in the hands of a pig farmer. The manure is like gold because it is so **valuable** in terms of its **equivalent plastic** and/or other chemical **products** and various **byproducts**. Electricity can always be made available by burning syngas or producing DME pure diesel for fuel. The manure enters a continuous flow system designed to operate in three important steps 1) input pig manure, 2) to a reactor to gasify the pig manure, and 3) output plastic that can be bought in raw commodity resin form for about \$0.84 per pound near the end of October 2021. Throughout 2021 the price has fluctuated between about \$0.72 to about \$1.44 per pound.

Pig Manure Gold is a Carbon Plastic Sink



The Carbon Gasification Solution (CGS) is one of the most pivotal slides in this presentation because it presents a simple way that a child can understand. Don't put CO2 into the atmosphere in the first place rather than removing it later.

SELL: Carbon Black HDPE Opportunity

The key principle in play is that **Carbon Black** of varying percentages mixed into HDPE becomes better than pure HDPE. It doesn't degrade in sunlight. **Carbon Black HDPE** plastic is electrically conductive and thermally conductive. It is Electromagnetic. **Carbon black** is an effective **screen against UV** and among the best **weathering stabilizers** available. If black is not an option, light stabilizers should be added that either absorb light or quench the detrimental chemical reaction caused by UV. (See Appendix D for additional information).

HDPE Resin Speculation

Wide price swings in the HDPE resin make a stable price like \$1.00 per pound sound attractive to a HDPE producer/seller. A stable and predictable price like \$1.00 per pound sounds great to a plastic consumer/buyer. Knowing a stable transaction settlement price of \$1.00 per pound is good for buying today in the store today for a redemption at some future time, at the same price as it was bought for. Therefore it is like a **zero interest** cash **loan** today for **future delivery** of pounds of HDPE for \$1.00 per pound at some future date, chosen by the consumer and subject to the availability of a supply of from #MGPTM producer nearby. For example, HDPE products for \$1 per pound of HDPE flakes that can alternatively be extruded as plastic wire, pellets, 4'x8' sheets of "3/4 wallboard, dimension plastic lumber, and so forth. The fixed price dilemma is solved by a CARTM token exchange which is discussed elsewhere.

HDPE Housing For Humans and Animals

This story assumes that plastic human-safe housing for humans and other animals will be a humane and worthwhile outcome of the #ManureGasPlastic[™] Solution. And it's a superb way to sequester carbon in a malleable material that can be shaped with heated tools. When it comes time to recycle, the recyclable plastic can be fed into the feedstock of the gasification reactor. Think of the value to house and building sculptors able to carve plastic sculpture and shapes into the walls of a plastic room. Want a shelf or window on a wall, carve it into the wall.

Useful Life of Plastic

When the plastic has lived its useful life it may be recycled in a number of ways. It may be ground up, melted, 3D printed, or gasified to create "first-run" HDPE plastic parts and products. High-density polyethylene (HDPE) or a thermoplastic polymer produced from the (second catalyst) monomer ethylene. With a high strength-to-density ratio, HDPE is used in the production of plastic bottles, corrosion-resistant piping, membranes, and plastic building materials.

R&D Opportunities

Composites

R&D opportunities galore exist in experiments with **composite plastic materials** mixed together for later 3D printing, injecting, forming, and shaping HDPE plastic. Testing each product life carefully, applying various plastic coatings to a wall. Does baking titanium mixed with plastic make a product with special properties?

Hydrogen and Oxygen Ratios

R&D would be useful to plot the **syngas ratio** of hydrogen to carbon monoxide and other gases against the optimal efficiency for pig manure. The research would continue for each type of livestock manure. R&D gas ratios optimization may be adjustable ratios for best stable flow operations. The project can go on to determine when the addition of oxygen at opportune moments in the overall pyrolysis process can create useful chemicals.

Mixing Manures

Mixtures of livestock manures of varying ratios can be tested for ease and efficiency of gasification. For example, how well does it work to mix 90% moisture content pig manure with lower moisture content chicken, beef, or dairy manure. The higher amount of nitrogen in chicken manure can be used to make ammonia based fertilizer, in liquid form for spreading on farm fields. Ash high in phosphorus and potassium can make a good fertilizer too.

Nutrient Recycling

Because the manure comes through an animal raising process, it means the necessary chemicals of crop life and pig pig life can end up in the meat and in the manure. The division and balance of nutrient chemicals in the food supply is an important consideration of the overall flow of nutrients necessary for livestock life and for human life. The value of the edible portions of live weight is self-evident. Additional value in the byproducts of the slaughtering add to slaughterhouse income. Any scrap bones make a wonderful bone char soil conditioner that is

highly prized by gardeners sold at \$16 per pound. Bones and fat trimmed and #ManureGasPlastic[™] gasified may be worth more than the meat itself. It certainly lightens the money loss when a herd must be euthanized. The entire pig product industry is a sensible R&D Opportunity.

Breakthrough Idea Front to Back Apparatus, Process and Solution

One breakthrough idea is that nobody has discovered the full value of assembling all of the pieces of the puzzle into an arrangement presenting a big picture solution that makes sense front to back. The first target process breaks down into one pathway from manure injection through the catalyst driven pyrolysis temperatures up to approximately ~ 800 °C to produce a hydrogen rich syngas main component of the syngas. Carbon monoxide is another primary component of syngas. This closed system exists inside a #ManureGasPlasticTM apparatus.

Closed Cycle Systems

Let's consider the closed cycle systems existing outside of a #ManureGasPlasticTM apparatus. Suppose instead that the manure could be spread on the crop farmland in the reduced form of #ManureGasPlasticTM byproduct ash or nitrogen based fertilizer. Rather than spreading the fertilizer in the form of manure, such as is commonplace these days, the ash, which is collected as a byproduct each day from #ManureGasPlasticTM operations are spread upon the fields instead. What remains in the ash came from the swine manure and contains all 13 of the essential plant nutrients that are used by plants. These include nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), manganese (Mn), copper (Cu), zinc (Zn), chlorine (Cl), boron (B), iron (Fe), and molybdenum (Mo). By blending in other nutrient sources a farmer could finetune the fertilizer to the specific crop's needs, and then spread it on the land. Presumably by feeding the right crops to the livestock, the human nutrients that exist in the consumable meat, might improve the human regional food supply.

R&D of Methanogen Bacteria

We must experiment with methanogen bacteria at near boiling temperatures and determine how much CO2 from the atmosphere can be fed to the methanogen bacteria which eat the carbon dioxide and produce methane.

Carbon Black UV Screen

Carbon black is an effective **screen against UV** and among the best **weathering stabilizers** available. If black is not an option, light stabilizers should be added that either absorb light or quench the detrimental chemical reaction caused by UV. (See Appendix D for additional information)

Blending HDPE and Carbon Black

There exist great R&D projects in experimenting with various HDPE & Carbon Black plastic composite material properties. For example, suppose a backend unit could be produced that bifurcates the #ManureGasPlastic[™] gas flow divides into a Carbon Black pyrolysis pathway and a distinct HDPE pathway. After the Carbon Black is available and HDPE is available, then the two pathways could be merged to produce Carbon Black HDPE plastic. The final product forming process, examples include extrusion and injection molding of 3D parts.

How is Everything Paid For?

How is this #ManureGasPlastic[™] apparatus, process, and solution paid for? The simple answer is that #ManureGasPlastic[™] is paid for from sales of renewable sourced plastic and other carbon based products. Turning a waste product like pig manure into a valuable product like organic HDPE plastic makes good sense. It is perhaps the best to sink sequestered carbon.

Biochar Soil Enrichment

To the extent desired, biochar can be produced instead of plastic. Biochar aids enrichment of the soil, which is another form of closing the carbon cycle. Soil enrichment adds more renewable sources of long term carbon sequestration.

CAR[™] Carbon Sink Token Opportunity

Carbonic LLC connects the livestock industry food supply chain to the farm produced #ManureGasPlasticTM output supply chain. Carbonic LLC makes this connection through a **CARTM Carbon Sink Token**. This can be made in the following steps. NOTE: "#CarbonBlackHDPETM is a specific **Brand**.

CAR[™] TOKEN FLOW

1. The transaction begins when a customer pays \$24 sales price for 24 one pound CAR[™] units of carbon sink value at \$1 per pound of HDPE. Or they pay \$2,000 for a CARton[™] of HDPE. A CARton[™] of HDPE weighs 2,000 pounds or one ton. The **cash** raised goes into spendable **income**.



- 2. The cash is immediately spendable by Carbonic LLC. The system waits for some future event to trigger delivery.
- 3. When the wait time interval has completed, the system sets a trigger.
- 4. The trigger reaches the farmer who produces the HDPE
- 5. a) The Farmer delivers the plastic.b) the farmer is paid \$1.00 per pound by Carbonic LLCc) OR the farmer may sell it for more than \$1.00 per pound in which case Carbonic LLC payment is cancelled and is no longer payable
- 6. The plastic is delivered by the Farmer to the CARTM owner.
- 7. The CAR[™] owner receives the HDPE
- 8. NOTE: "Carbon Black HDPE™" is different from #MGP[™] HDPE

HDPE Supply Chain

The supply chain of #ManureGasPlastic[™] HDPE production creates markets for products like pig barns, water handling, housing, and other industries supporting the long lived sequestration of plastic materials. This creates job market demand for Chemical Engineers, meat industry workers, and scientists to analyze the vast range of composite materials that can be produced, futurists, STEM educators, scientists, technologists, engineers, mathematicians, humanists, philosophers, and so forth.

Is It Profitable?

Right-sizing and deploying carbon gasification and HDPE production capabilities within shipping containers for each of the 3,000 farms in MN, long-term, could gross each farmer approximately \$250,000 per year via the sale of #MGP[™] HDPE plastic. Herein lies an optimization question: Is it cheaper and more efficient to create shipping container carbon gasification and HDPE production facilities for each and every average sized pig farm, many of which could be used in parallel for larger farms? Or, would the cost competitiveness of a larger farm with a larger facility, with the additional revenue of plastic sales be so much more **profitable**, that the pork industry could be further **centralized**?

The Process Flows Continuously

Pig farms deal in live animals that need to be processed when they grow to the size that meets the size standard for the pork industry's processing equipment. Additionally, being that the pigs are live animals, in the event that the gasification sequestration equipment quits and takes a day off, the pigs will not and any delay in processing the manure, will create a backlog of manure to be processed, which could build up over time, overflow lagoons, and simply cause the pollution problems intended to be solved. The miniaturization, right-sizing, if you will, of carbon gasification sequestration into HDPE facilities creates a modular, well fitted solution for small and average sized farms as well as large farms alike.

Pig Manure #ManureGasPlastic[™] Calculations

Pig manure is 90% moisture content 10% dry matter (DM) content = 1,200 lbs DM/herd/day 5.4% of raw manure (or 12,000 lbs / day) is organic carbon = 648 pounds of carbon/day OR 756 lbs of HDPE/day (based on chemist computations) BECAUSE 1 POUND SELLS FOR \$1, THEREFORE = \$756 of organic HDPE/day (based on 756 pounds of HDPE/day x 365 days = around \$276,000 of HDPE plastic containing sequestered carbon/year at fair price.

Original Cost Recovery

For the farmer \$276,000 per year recovers the original capital outlay of \$500,000 for the system in approximately 4 years. This included the \$5,000 monthly operations support cost.

Farm Operational Costs

Pig Farm Annual Financials

#13 Pig Farm Annual Financials

Pig Farm Income

\$324,000 Pork Gross Income for 1,200 Pig Herd

\$276,000 Plastic Sales Gross Income

\$600.000 Gross Income

Pig Farm Expense

\$160,000 Total Production Budget for Farm

\$ 60,000 #ManureGasPlastic[™] Operations Support (\$5,000 per mo.)

Page 19 © 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Carbonic LLC

Net Income

\$380,000 Net Income from Herd



The \$600,000 pig farm gross income consisted of \$324,000 income from pork sales and \$276,000 income from plastic sales. Subtract \$160,000 farm operating costs and \$5,000 per month operations costs for the #ManureGasPlastic™ apparatus. This yields **\$380,000** yearly **net income** per a 1,200 pigs herd.

Capitalize #ManureGasPlastic[™] One Time

#15 Capitalize

Carbonic LLC



\$80,000 one time	R&D Chemistry Bench Proof of Process
\$120,000 one time	Build Mobile Unit Prototype for Onsite Demo
\$100,000 one time	Build 1st Pig Manure Front End Input
\$100,000 one time	Build 1st Manure to Syngas Middle Process
\$100,000 one time	Build 1st Plastic Back End Output
\$100,000 one time	Build Extruder Rod, Pellet, Brick, and Lumber
\$100,000 one time	Package Units Inside Container
\$100,000 per year	R&D Plastic Product Market Uses

TOTAL = \$800,000 One Time Capitalization

Contractors Needed Per Year

#16 Contractors Needed P	er Year	Carbonic LLC
Admin. Teams	Contractors	Dev. Teams
Admin. Support Bookkeeper County Coordinator Social Media	\$1,200,000 Per Year	Bench Chemist Chemical Engineer Mechanical Engineer Automation Engineers (x3)
\$120,000 budget per year		\$720,000 budget per year
Legal Council IP Attorney Accountant		Content Editor Marketing Sales Social Media
\$120,000 budget per year		\$240,000 budget per year

Strategic Business Plan

Right Sizing is Strategic

The Carbonic LLC innovation is all about scaling down the size of existing carbon gasification technology. Rather than advocating for centralized, large scale, region wide solutions, Carbonic LLC advocates for smaller, localized and **distributed farm** solutions where farm can each have their own #ManureGasPlasticTM apparatuses spread about their farm to utilize the continual production flow of manure. Large centralized manure processing solutions require either piping or trucking of raw manure from farm locations to a centralized facility. This raises environmental concerns over storing and possible spills enroute from farm to processor. People will have legitimate concerns about smells and leaks.



Right-sizing a #ManureGasPlastic[™] solution requires a 6 Ton or greater Daily continuous flow pig manure processing capacity. Each day of continuous processing from a 1,200 pig herd yields approximately \$756 per day of income from plastic sales. At the same time, the solution tackles the environmental challenges presented by pig farms, in a relatively straightforward way. The technology exists. For example, the University of MN developed the chemical catalyst used in the idealized gasification step to produce syngas.

#ManureGasPlastic[™] Technology Plan

Standardized Industrial Parts

Many **industrial elements** such as pumps, furnaces, reactors, and distillation equipment are available at shipping-container-scale. As with any engineering challenge, the plan is to break the project into parts that can be tested and combined in parallel. First, a macerating pump and piping system transports the pig manure from a (smaller) holding lagoon to be sprayed into the gasification reactor where it reacts with a first catalyst to produce syngas. Second, the syngas and a second catalyst are reacted in a second reactor and possibly a third catalyst to produce HDPE plastic. This is a simplified description of a complex chemical / industrial process for the purpose of this Business Plan. With a basic understanding of the technical process of turning #ManureGasPlasticTM carbon into HDPE plastic, the technology development plan is to prove the processes described above and itemized here: (1) pumping and transportation of syngas, (4) reaction of syngas with a catalyst/s, and (5) the continuous output of HDPE plastic, and then integrate the apparatus and processes together within a shipping container(s).

Technology Development Plan

With the **Technology Development Plan** in place, the product-market fit must be explored. It is expected that accurately determining the product-market fit will consist of working with farmers to assure that the shipping container form factor is acceptable and to further assure that financing and return on investment / payback terms are fair to all concerned. In an effort to de-risk the opportunity and garner buy-in, it is desirable to build a 10,000 lb or less trailerable demonstration that can be transported to and from pig farms around the state.

With a 10,000 lb or less trailerable demonstration model completed, the process can then be scaled up to the size of a shipping container, the operating and ownership costs, and profitability can be finalized, and sales made throughout the trailerable demonstration process can be fulfilled. It is further expected that the trailerable demonstration process will result in farmers providing investment capital to complete the fulfillment of the product and grow the business. Those farmers who do invest will receive distributions from the business the same as any investor, further enhancing their profitability relative to the implementation of a #ManureGasPlasticTM to HDPE plastic carbon sequestration solution.

Create Awareness and Convert Customers?

Child Awareness

Every school child will become enamored with the pig farm manure to plastic story. Especially when they receive their 3" x 3" x 3" HDPE cube. They will hold the one pound in their hand while they imagine that one pound inflating into a 24 foot by 24 foot cube of carbon-dioxide being removed from the air and reduced to plastic. A cube could be given to a school child to reward them for their interest in agriculture, chemical engineering, chemistry, biology, environmental science, STEM, and other studies with good grades where the child is making a difference, as judged by their peers, teachers, and mentors.

A useful **4H and STEM Project** would be to build a **HDPE Pigpen**. Virtually and then for real. The challenge would be to build in a manure capture capability. Ideally, the pig pen would be twice as long as it is wide. An 8- by 16-foot pen is common so, at 50 square feet per pig, that would provide enough room for two pigs. Each pig produces 10 lbs. of manure per day. That would be a great project for a STEM team to figure out how to capture that manure.

Adult Awareness

Every adult will value the affordable housing that can be constructed from HDPE materials costing \$1.00 per pound. HDPE locked in a sculpture would count as sequestered. A 24 ton HDPE house costs \$48,000 in the spreadsheet model.

Imagine Plastic Land

Every person can imagine a plastic world they can quite literally create with the right printers and HDPE supply. Imagine an HDPE world of inexpensive, durable, adaptable, safe housing, with a builtin sprinkler fire safety system, after all, it is a washable plastic house and can easily hold water in the walls. Architects will be needed. Professionals will love an HDPE world because of its adaptability in business and pleasure settings.

Creating Awareness

Creating awareness comes from winning awards, creating websites, finding capital and the right people, and having the vision to articulate. Awareness comes from effective marketing. The idea "has legs" as they say. It ignites the imagination.

Major Risks/Challenges

Solution is new/untested. Areas of risk include: Process refinement to determine: catalysts, temperatures, pressures, and equipment scale for single farm units. As capital is raised, finding and building the right team will be a challenge. Delays in staffing can turn into days of schedule slippage.

Have you validated your solution?

Right-sizing a #ManureGasPlastic[™] gasification and sequestration into HDPE plastic facility to gross 3,000 MN based pig farmers approximately \$756 per day or \$276,000 per year and tackle the environmental challenges presented by pig farms is a relatively straightforward process. The technology exists. The University of MN produced the chemical catalyst and many industrial elements such as pumps, furnaces. reactors. and distillation equipment available are at shipping-container-scale. As with any engineering challenge, the plan is to break the project into parts that can be tested and combined in parallel. First, a macerating pump and piping system transports the pig manure from a (smaller) holding lagoon to be sprayed into the gasification reactor where it reacts with a first catalyst to produce syngas. Second, the syngas and a second catalyst are reacted in a second reactor to produce HDPE plastic. Please accept this as a simplified description of a complex chemical / industrial process for the purpose of this application. With a basic understanding of the technical process of turning #ManureGasPlastic[™] output into HDPE plastic, the technology development plan is to prove the processes described above and itemized here: (1) pumping and transportation of manure, (2) spraying of manure and reacting with a catalyst, (3) transportation of syngas, (4) reaction of syngas with a catalyst, and (5) the continuous output of HDPE plastic, and then integrate them together within a shipping container(s).

Product Market Behavior Change

We plan to interview approximately 100 qualified prospect farmers to determine what would be needed for them to adopt our solution. Our goals: 1. understand barriers to purchase, 2. identify influential/ positive triggers, 3. identify marketing messaging. We would also hopefully meet early adopters/customers ready to act. Data from this primary research would be part of our go/no-go decision to develop a working prototype.

Laboratory Bench Unit

A bench chemist may be able to create a benchtop that will prove out the overall process using pig manure syngas produced by direct or indirect means that simulate a pig manure gasification mixture being fed into an HDPE plastic production unit for 3D printing.

10,000 lb Trailerable Demo Unit

In an effort to de-risk the opportunity and garner buy-in, it is desirable to build a 10,000 lb or less trailerable demonstration that can be transported to and from pig farms around the state. With a 10,000 lb or less trailerable demonstration completed, the process can then be scaled up to the size of a shipping container, the operating and ownership costs, and profitability can be finalized, and sales made throughout the trailerable demonstration process can be fulfilled. It is further expected that the trailerable demonstration process will result in farmers providing investment capital to complete the fulfillment of the product and grow the business. Those farmers who do invest, could then receive dividends or distributions from the business, further enhancing their profitability relative to the implementation of a #ManureGasPlasticTM output to HDPE plastic carbon sequestration.

Prototype At Scale

This topic is discussed in the "Right Sizing" section and other sections.

Progress

Carbon gasification, in unrelated fields, has existed since the early 19th century. Carbonic LLC, has conceptually realized the vision of turning the problem of the fecal lagoons of pig farms that contaminate both air and ground water with putrid pollution, into an opportunity for pig farmers to earn an additional \$250,000 a year in revenue with an on-site and modular HDPE plastic production solution.

Carbonic LLC, has embraced proven science, technology, engineering, and mathematical modeling methods, generally supported by literature searching, to

Page 26

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

detail the business opportunity for farmers, as well to determine the applicability of a right-size, shipping container based solution capable of scaling from the average pig farm, up to the upper quartile in size.

Production at Scale

Carbonic LLC, has further contemplated how to break a large gasification and HDPE plastic production facility into components capable of being implemented within a 10,000 lb bumper-pull trailer demonstration and a 40' long shipping container industrial solution. The #ManureGasPlastic[™] apparatus might need multiple trailers. If one arrangement doesn't work or doesn't fit the constraints then the existing prototype units and parts will be salvaged and new units and new parts will be tried out.

1.5 to 2..5 Ton Per Hour Capacity

https://mavitecrendering.com/gasification-a-new-way-of-solving-manure-issues/ Mavitec Environmental is part of the Mavitec Group. Together with Mavitec's American partner EarthCare, Mavitec has been developing gasification systems since 2002. Mavitec has full scale plants with a capacity of **1.5 up to 2.3 ton/hr**, operating in the U.S.A. (cow manure, chicken, turkey and hog litter, wet distillers grain, food waste), The Netherlands (pig manure) and Russia (layer poultry, turkey litter). More installations under construction in the Middle East.

Constraints and Ideals

Constraints and Ideals

Physical Unit Size Ideals

- Inside max 7'6" square end face
- 2. Inside max length 40'
- 3. Inside actual length is 10', 20', and 40'

HDPE Markets

- 1. Safe Homeless Housing
- 2. ErgoCube[™] Storage

Daily Processing Capacity

- 1. 6 ton per day min
- 2. 500 lbs per hour
- 3. 750 lbs HDPE

Weight U.S. Ton

- 1. 33.6 ton max weight
- 2. Seek to preserve horizontal center of gravity

Carbonic LLC hopes to realize 1) a 10,000 lb bumper-pull trailer and 2) a 40' shipping container capable of showing the world that a barrel of pig manure is roughly equivalent in value to a barrel of crude oil remaining mindful of the fact that plastic effectively sinks atmospheric carbon before, before into atmosphere.

Renewable HDPE Production

With such a future potential HDPE production capability being able to be sold to 60,000 farms pig throughout the United States, HDPE could increasingly become a renewable material in the form of composite lumber, injection molding and 3D printing pellets and filament, respectively, as well as a means to inspire the next generation of entrepreneurs and engineers with a **1lb** HDPE 3"x3"x3" cube commemorating the sequestration of carbon from what might have otherwise been expanded to approximately 24'x24'x24' of the Earth's atmospheric carbon dioxide.

Embrace Proven Science Technology Engineering Mathematics (STEM)

Carbonic LLC embraces science, technology, engineering, and mathematical modeling methods, generally supported by searching the literature, to detail the business opportunity for farmers, as well to determine the applicability of a right-size, shipping container based solution capable of scaling from the average pig farm, up to the upper quartile in size.

HDPE Renewable Material

With such an HDPE production capability able to be sold to 60,000 farms throughout the United States, HDPE could increasingly become a renewable material in the form of composite lumber, injection molding and 3D printing pellets and filament, respectively, as well as a means to inspire the next generation of entrepreneurs and engineers with a 1lb 3"x3"x3" HDPE cube commemorating the sequestration of carbon from approximately 24'x24'x24' of the Earth's atmosphere.

Next Steps

Summary of next steps: The first big step is to build, test, and launch the first #ManureGasPlasticTM container. Based upon the projected market price of \$500,000 for each #ManureGasPlasticTM container, an adequate budget to build and test the first container is approximately \$1.5 million. A seed fund of \$240,000 would enable half a year of chemical and mechanical engineering capability to deliver a bumper-pull demonstration for/with a volunteer pig farmer.

Need Minnesota Factory Location

We need a factory location in Minnesota. The #ManureGasPlasticTM container is a product bound to strict load limits on public roadways. We will haul #ManureGasPlasticTM containers on public and private roadways. For example, we can easily work in a laboratory workshop in one place and then haul the resulting #ManureGasPlasticTM containers to its startup testing location. We can haul the

Page 29

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

#ManureGasPlastic[™] containers anywhere in Minnesota. We can haul a #ManureGasPlastic[™] container anywhere. Built in Minnesota and shipped anywhere on earth. Maybe into space too. #ManureGasPlastic[™] here we come!

Find a Minnesota Factory

But first, before these dreams can be **fully launched**, we need up to \$4.8 million of investor capital to build or lease the factory necessary to build the first #ManureGasPlasticTM container apparatus. Perhaps a Minnesota based #ManureGasPlasticTM LLC legal entity will be necessary to share income among member capital investors and time investors.

Is there a prototype or MVP?

There is no physical prototype or MVP because up until now, nobody has seen the opportunity in using the pig manure to plastic workflow as a primary way to sequester carbon. It is like a puzzle with many pieces that fit together properly. Gasified pig manure does turn into syngas composed of hydrogen and carbon monoxide, carbon dioxide, methane and other gases depending on the composition of the manure. The backend HDPE catalyst does indeed behave as expected. The technology is pretty well understood. There are many interesting R&D experiments in the science experiments on HDPE composite materials. In some sense the puzzle pieces are falling into place and the big picture emerges of of right-sized pig manure gasification to HDPE production facilities being the optimal answer to questions about pig manure, other meat and poultry, manures, human sewage, and the whole question of municipal waste handling and other biomass production of hemp and other fast growing plants that eat lots of carbon dioxide and fix carbon in a form well suited to carbon gasification.

Carbonic LLC Financials

Capitalize #ManureGasPlastic[™] One Time

#15 Capitalize

Carbonic LLC

\$80,000 one time	R&D Chemistry Bench Proof of Process
\$120,000 one time	Build Mobile Unit Prototype for Onsite Demo
\$100,000 one time	Build 1st Pig Manure Front End Input
\$100,000 one time	Build 1st Manure to Syngas Middle Process
\$100,000 one time	Build 1st Plastic Back End Output
\$100,000 one time	Build Extruder Rod, Pellet, Brick, and Lumber
\$100,000 one time	Package Units Inside Container
\$100,000 per year	R&D Plastic Product Market Uses

TOTAL = \$800,000 One Time Capitalization

Contractors Needed Per Year

#16 Contractors Needed P	er Year	Carbonic LLC
Admin. Teams	Contractors	Dev. Teams
Admin. Support Bookkeeper County Coordinator Social Media	\$1,200,000 Per Year	Bench Chemist Chemical Engineer Mechanical Engineer Automation Engineers (x3)
\$120,000 budget per year		\$720,000 budget per year
Legal Council IP Attorney Accountant		Content Editor Marketing Sales Social Media
\$120,000 budget per year		\$240,000 budget per year

Apparatus, Support, and Community

Patent Class Areas

#ManureGasPlastic[™] Apparatus
#ManureGasPlastic[™] Process Closed Cycles with Feedback and Control
#ManureGasPlastic[™] Solution Workable Economy HDPE Housing for Homeless
#ManureGasPlastic[™] Community STEM For Everyone Help Needed and Offered Exchange
#ManureGasPlastic[™] Support

Carbonic LLC Cash Balance, Monthly Expense, and Monthly Income

As of October 31, 2021 cash balance is about \$30K and burn rate is about \$5K/mo.

Page 32

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Carbonic LLC operating Agreement

Schedule A Carbonic LLC

Member Name and Address	Capital Contributions	Number of Units
Lyno Sullivan <street address=""></street>		
Woodbury MN 55125-9291	\$60,000	60,000

Projections Year Over Year Growth Percentage

	Projection Period							
Input Cells	Year 1 2021	Year 2 2022	Year 3 2023	Year 4 2024	Year 5 2025	Year 6 2026	Year 7 2027	Year 8 2028
Net Income	(\$115,000)	(\$455,000)	(\$525,000)	\$6,098,750	\$16,875,600	\$27,000,960	\$42,661,517	\$66,277,714
% margin	(23.0%)	(13.0%)	(3.0%)	17.0%	28.0%	28.0%	28.0%	29.0%
Income Statement Assumptions								
Sales (% YoY growth)		600.0%	400.0%	105.0%	68.0%	60.0%	58.0%	50.0%
Cost of Goods Sold (% margin)	110.0%	90.0%	80.0%	60.0%	50.0%	50.0%	50.0%	50.0%
SG&A (% sales)	10.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Other Expense / (Income) (% of sales)	2.0%	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	- %
Depreciation (% of sales)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Amortization (% of sales)	- %	- %	- %	- %	- %	- %	- %	- %
Interest Income	- %	- %	- %	- %	- %	- %	- %	- %
Tax Rate	- %	- %	- %	- %	- %	- %	- %	- %
Net Income From Above (row 34)	(\$115,000)	(\$455,000)	(\$525,000)	\$6,098,750	\$16,875,600	\$27,000,960	\$42,661,517	\$66,277,714
Net Income Carbonic LLC	(\$800,000)	(\$810,000)	\$2,100,000	\$6,180,000	\$18,030,000	\$29,070,000	\$80,910,000	\$88,110,000
Difference in Net Income <<< \$0 goa	(\$685,000)	(\$355,000)	\$2,625,000	\$81,250	\$1,154,400	\$2,069,040	\$38,248,483	\$21,832,286

Carbonic LLC modified the template spreadsheet provided by Lurie, LLP. The modified percentage sales growth year over year is shown above in the blue shaded section. The row for Net Income of Carbonic LLC presents net income is computed in a way based on a model focused on how to deliver high quality #ManureGasPlasticTM products to market.

GOAL : Projections Of Success

The big picture goal is the operation of 1,200 Carbonic LLC #ManureGasPlastic[™] installations on pig farms located in Minnesota. The following table shows computation based upon

- GOAL: 1,200 customers/pig farms with #ManureGasPlastic[™] in MN
- The total number of factories grows over time
- Improved #ManureGasPlasticTM models are introduced every two years

- Sales income and Operations Services income is reduced by cost of goods sold
- Staffing costs include permanent Carbonic LLC operations staff
- Staffing costs include factory workers to staff the factories
- Consider manufacturing costs to build factories
- Consider alternative manufacturing costs to lease factories
- Consider #ManureGasPlasticTM truck and trailer options
- Compare the modified template results looking for consistent outcomes
- Establish the year when the GOAL of 1,200 MN customers/pig farms is attained
- GOAL: Attained in MN pig farm installations of #ManureGasPlastic[™] in 2028

	Projection Period							
Input Cells	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
	2021	2022	2023	2024	2025	2026	2027	2028
Total Factories	1	3	4	6	8	12	20	18
Build Polynk™ per Factory	1	3	3	6	12	12	24	24
Built Polynk™ All Factories	1	9	12	36	96	144	480	432
Total Polynk™ In Service	0	9	21	57	153	297	777	1209
Brand Model	Model A		Model B		Model C		Model D	
Sales Income Polynk™	-	\$500,000	\$500,000	\$500,000	\$480,000	\$480,000	\$460,000	\$460,000
Cost of Goods (COGS) per Polynk™	\$800,000	\$600,000	\$360,000	\$360,000	\$340,000	\$340,000	\$340,000	\$340,000
Net Income Polynk™ Sales	(\$800,000)	(\$900,000)	\$1,680,000	\$5,040,000	\$13,440,000	\$20,160,000	\$57,600,000	\$51,840,000
Operations Income	-	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
Cost of Goods (COGS) Operations	-	\$50,000	\$40,000	\$40,000	\$30,000	\$30,000	\$30,000	\$30,000
Net Income Operations	-	\$90,000	\$420,000	\$1,140,000	\$4,590,000	\$8,910,000	\$23,310,000	\$36,270,000
Total Net Income	(\$800,000)	(\$810,000)	\$2,100,000	\$6,180,000	\$18,030,000	\$29,070,000	\$80,910,000	\$88,110,000
Staffing Cost -	\$1,325,000	\$1,725,000	\$1,985,000	\$3,210,000	\$6,860,000	\$9,060,000	\$26,960,000	\$24,360,000
Net Income With Staffing	(\$2,125,000)	(\$2,535,000)	\$115,000	\$2,970,000	\$11,170,000	\$20,010,000	\$53,950,000	\$63,750,000
Build Factories <<<	\$168,000	\$576,000	\$768,000	\$1,368,000	\$2,400,000	\$3,600,000	\$8,880,000	\$7,992,000
Net Income Build	(\$2,293,000)	(\$3,111,000)	(\$653,000)	\$1,602,000	\$8,770,000	\$16,410,000	\$45,070,000	\$55,758,000
Build Versus Lease								
Lease Cost <<<	\$91,200	\$345,600	\$460,800	\$907,200	\$1,785,600	\$2,678,400	\$7,344,000	\$6,609,600
Net Income Lease	(\$2,216,200)	(\$2,880,600)	(\$345,800)	\$2,062,800	\$9,384,400	\$17,331,600	\$46,606,000	\$57,140,400

GOAL#1: Breakeven Year 4 (2024)

GOAL#2: 1,200 Operating #ManureGasPlastic[™] By 2028

The data table above is the Carbonic LLC growth capacity model. It comes out slightly ahead of the sales year over year percentage projection model. The fact that the two models follow similar upward trajectories allows each to be adjusted for more consistent projections. The growth in income starts off with a single #ManureGasPlasticTM sale, and is then sustained through #ManureGasPlasticTM

Page 34

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

management fees paid monthly. The two income streams factor in income and COGS for both.

Income Growth Prospects

There is a significant potential for exponential growth in U.S. states containing livestock farms. Minnesota alone contains 3,000 pig farms/customers who could buy #ManureGasPlastic[™]. Let's assume 1,200 of them do so. This equates to a \$600 million dollar #ManureGasPlastic[™] market in MN with large potential for growth in other types of livestock. Additionally, the management fee to Carbonic LLC from this number of pig farms would result in \$6 million in monthly recurring revenue.

The top U.S. swine producing states as of March 2021 are Iowa at 23.8 million hogs, Minnesota at 9 million, North Carolina at 8.5 million, Illinois at 5.25 million, and Indiana at 4.35 million. That's about 50 million hogs producing 10 pounds of manure each or 500 million pounds of manure per day. With 90% water content, that leaves 50 million pounds of manure solids of which about half, or 25 million pounds is carbon valued at \$1 per pound.

Income Growth Risks

Risks to income growth include competition from big players in the plastic industry. Established competitors can drive the price beyond the Carbonic LLC suggested selling price of \$1/lb of plastic paid to the farm by a purchaser. Income growth could diminish when supply chain disruptions occur, such as critical parts supplies, critical materials supplies, and perhaps the greatest risk of all is a shortage of essential catalysts needed for the whole process to work. Another important risk to consider is extreme growth beyond expectations that is difficult to manage. This would diminish #ManureGasPlasticTM supply such that it is unable to keep up with demand. When #ManureGasPlasticTM demand is greater than supply, increased production must occur. On the other hand, when #ManureGasPlasticTM supply is greater than demand, our marketing and sales people must create new markets and expand existing markets.

State and National Value Proposition

The State of Minnesota's value proposition using MN public information is 3,000 pig farms raising an average of 1,000 pigs each. That is millions per year of new found income earned by MN pig farmers selling plastic. The United States' value proposition: 60,000 pig farms generate a \$41.4 billion market. Plus a bonus of 41.4 billion pounds worth of Carbonic LLC certified carbon captured and sequestered each year.

Carbon Sequestration Ownership

Carbonic LLC establishes the authenticity of ownership of any quantity of plastic sequestered carbon recently captured from living biological sources and not petroleum or coal. That is precisely what is meant by a pound of high density polyethylene (HDPE) plastic being a "Carbonic LLC Certified" carbon sequestration event. A proposed cryptocurrency transaction is written permanently into a blockchain as proof of ownership.

Does The Science Work?

The process of gasifying manure to produce syngas, as well as the process of using syngas to produce plastic has been around since the 1950s. The parameters used in the computations in this paper are approximated and rounded for ease of math.



Market for the Technology

Disruptive Technology

The Carbonic LLC #ManureGasPlastic[™] technology disrupts established systems.

Page 36 © 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

- 1. Gasifying pig manure quickly after production reduces the need for pig manure to be stored in lagoons.
- 2. Reducing the amount of manure spread on fields changes the dynamics between Carbonic LLC customer/pig farm management companies and city, county, state and federal government regulators.
- 3. A concentrated animal feeding operation, or CAFO, is bound by rules concerning how much pig manure can be spread on land. This constrains how many pigs can be on a farm. When manure is no longer spread on fields, CAFO rules may be less of an issue.
- 4. It is disruptive for Carbonic LLC to reserve the right to certify proof of ownership and chain of custody in its blockchain.
- 5. There are many disruptive possibilities which can be good for agriculture. Turning agricultural waste into an income stream is just part of a large, overall answer.

Everybody is Concerned About Water

A Clean Water Supply

Water quality standards are important for the meat supply portion of pig production. Fortunately #ManureGasPlasticTM doesn't worry about pathogens in the pig manure and other biomass supply sources because the gasification reactor operates at over 700 degrees centigrade which effectively kills pathogens.

Raw Pig Manure is 90% Water

#ManureGasPlastic[™] has a concern about water in manure which can be up to 90% of the raw manure. Too much water quenches the flame. The water can be mostly consumed depending on the catalysts and processes involved. This document does not discuss the operation of the manure gasification catalysts because they are proprietary.

Water Inside #ManureGasPlastic[™]

Government regulations and permitting are always followed. #ManureGasPlasticTM helps solve manure and water problems by turning them into an income stream at the source. Manure disappears into a syngas cloud and can come out the backend as products that provide carbon sequestration opportunities. Products like plastic can sequester carbon for decades.

Product Pricing

Constraints on \$500,000 Product

The marketing and sale of the Carbonic LLC systems sold to pig farmers is constrained to 1) have a one time cost of \$500,000, 2) have operating costs less than \$5,000 per month, 3) fit inside international shipping containers, 4) weigh less than 33.6 tons, 5) have the capacity to process 6 tons of manure per day which works out to a continuous flow capacity of 500 pounds of manure per hour, and 6) have a built in, field swappable monitoring and control system with internet communication to each unit's cloud server, where the data logs are sent for analysis and long term storage.

Target Price and Cost For First #ManureGasPlastic[™]: \$500,000

Estimated breakdown of a hypothetical cost of #ManureGasPlasticTM priced retail at \$500,000 is shown as follows below. These costs constrain the final product. During supplier vendor discussions these cost components must fit within the budget constraints but may be overrun at the start.

#15 Capitalize #ManureGasPlastic[™] Startup

This table explains the best case startup costs for the purpose of getting a startable and safely runnable apparatus for turning pig manure into plastic. The drawing below presents the capitalization Cost Picture for a beginning prototype #ManureGasPlastic (#MGP).

Carbonic LLC

C#15 Capitalize

\$80,000 one time	#1 R&D Chemistry Bench Proof of Process
\$120,000 one time	#2 Build Mobile Unit Prototype for Onsite Demo Gather people needed for startup completion.
\$100,000 one time Reward for winner	#3 Build 1st Pig Manure Front End Input Contest winning apparatus & process
\$100,000 one time	#4 Build 1st Manure to Syngas Middle Contest winning apparatus & process
\$100,000 one time	#5 Build 1st Plastic Back End Output Contest winning apparatus & process
\$100,000 one time	#6 Build Extruder Rod, Pellet, Brick, and Lumber
\$100,000 one time	#7 Package Units Inside Container
\$100,000 per year	#8 R&D Plastic Product Market Uses

TOTAL = \$800,000 One Time Capitalization

Simplified Capitalization

\$100,000 Gross Margin (0% to 20%)
\$100,000 #3 Fresh Manure Input and Moisture Reduction (20%)
\$100,000 #4 Gasifier (20%)

Page 39

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

\$100,000 #5 Plastic HDPE Reactor (20%)
\$50,000 HDPE Extruder (10%)
\$50,000 Contingencies (10%)

The first #ManureGasPlastic[™] apparatus manufacture may break even. If #3, #4, or #5 apparatus costs more than is budgeted for, the production of the affected apparatus will cease until the matter is resolved. Meanwhile the other units will proceed on their schedules as planned. Lessons learned will reduce costs for subsequent units built. The recurring \$5,000 monthly operating expense incurred by the farmer will help Carbonic LLC with its cash flow.

Marketing Strategy

Happy Customer Story

The final transaction with an end user enables a story to be told. #ManureGasPlastic[™] turns manure into plastic which creates an income stream. The customer is a pig farmer. The happy farmer with 1,200 pigs producing 6 tons of manure daily will create, with the help of #ManureGasPlastic[™], 756 pounds of plastic. The customer/farmer can sell their Carbonic LLC Certified biosystem source plastic for \$1/lb. Thus, \$756 per day adds up to about \$276,000 per year of new income. The basic plastic extruder model produces various uniform sized plastic construction grade bricks and standard dimensional plastic lumber. Stinky methane laden manure is cleanly turned into human safe plastic building materials and, as a side benefit, helps foster Carbonic LLC's vision and mission of capturing and sequestering carbon in the plastic.



The Addressable Market in MN

The Minnesota Pollution Control Agency (MPCA) provides a spreadsheet/database of 38,000 Minnesota feedlots of which approximately 3,000 are pig farms.

Page 40

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Therefore 100% of the potential pig farms/customers are known already. In April 2021, Carbonic LLC acquired the MPCA spreadsheet containing over 160 data points for each of the 38,000 feedlot farms being monitored by the Minnesota Pollution Control Agency. For many questions, Carbonic LLC can simply query this public database. Knowing the mailing address of every feedlot farm in Minnesota helps with marketing. All customer/pig farms will receive mail from Carbonic LLC with information about #ManureGasPlastic[™]. This bodes well for locating and contacting customers in all the big swine producing states like Iowa, North Carolina, Illinois, Indiana, and others. The next big market after pigs might be poultry, then cattle. To a #ManureGasPlastic[™] manure is manure. Adaptations on the front end allow different biomass feedstocks for gasification to syngas.

Carbon Sequestration Is The Big Picture Innovation



Our #ManureGasPlastic[™] technology serves a higher purpose. It captures carbon gases before they escape into the atmosphere. #ManureGasPlastic[™] captures the carbon in pig manure and sequesters that carbon in plastic for decades. Using the correct front end technology, the Carbonic LLC Technology can even pull carbon dioxide emissions directly from the atmosphere using methanogen bacteria that eat carbon dioxide and produce methane. When each farm has its own localized manure to plastic technology, concerns will lessen and perhaps disappear as the good news about #ManureGasPlastic[™] apparatus, process, and solution spreads in popularity.

Big Competitors to the Carbonic LLC Solutions

The biggest competitor/collaborator to #ManureGasPlastic[™] is the carbon credit system wherein one carbon credit is equal to one tonne (2204.6 lbs.) of carbon dioxide. Carbon credit trading is an application of an emissions trading approach. Greenhouse gas emissions are capped and then markets are used to allocate the

emissions among the group of regulated sources. A carbon credit contains the removal of a gas from the atmosphere and its compression. The Carbonic LLC "Manure to Plastic" campaign produces a solid form that is put into common use. There really is no comparison between the two approaches. Human friendly plastic is the desirable answer.

Sales Incentives

Sales Incentives are designed to give the Sales Team an opportunity to pass along various Sales Incentives and Rewards to the Customer. The Sales Staff can receive rewards for sales connections made that result in a customer buying the \$500K #ManureGasPlastic[™] apparatus. This rewards program offers no commission arrangement but is rather a fair way to divide revenue among those Sales Staff as members of the Marketing and Sales Team in the form of performance awards, rewards, and someday Carbonic LLC Education Expense (EDU) units which are exchangeable with the Carbonic LLC Carbon Sink (CAR) unit.

Carbonic LLC Market Penetration Strategy

When Carbonic LLC opens a new market, we will complete several steps.

- 1. Hire Carbonic LLC State Coordinator to gather data about states, counties, and cities
- 2. Seek farm equipment dealers and manufacturers as Channel Partners
- 3. Seek pig farm management companies as customers and Channel Partners
- 4. Seek state and county data about feedlots for use in marketing campaigns

The minimum viable product (MVP) is a small subset of the overall general system wherein the pig manure derived plastic ends up affecting humanity living with a human safe plastic housing market. With general HDPE markets gaining an expanded vision of the role of plastic in the modern world. We foresee a day when plastic is recognized as perhaps the best way to sequester carbon. Delivering safe housing, water supply, and sewage handling, is like a dream come true. The major 2021 deliverable is to continue the 2020 manure and money flow models beyond their current MVP stage.

It is time for the dreams to become a reality. The next steps to attaining this outcome include verifying the spreadsheet model. Then find money to build a prototype of a miniature version of the #ManureGasPlastic[™] that demonstrates how an HDPE plastic milk jug filled with a liquid pig sewage slurry can be poured in the input chute and HDPE plastic extrudes out the backend. Kids are gonna love it.

The most immediate need is to raise capital sufficient to 1) find a scientist/engineer to verify the spreadsheet model calculations, 2) set up a laboratory bench and help design a portable demonstration apparatus that can be trailered to marketing and education presentations, and 3) design how to scale a final plant to fit in one or more containers. The 2021 cost estimate for this first leg is estimated at \$120,000.

Next, for 2021 and 2022 the capital must be raised to build the first facility at the first pig farm. The current estimate is \$4.8 million for the front-end pig manure handling system, the middle manure gasification reactor, and the back-end HDPE plastic producer. The target plant must be able to handle approximately 6 tons of manure per day. Commercial full scale plants with a capacity of 1.5 up to 2.3 ton/hr. are operating in the U.S.A. (cow manure, chicken, turkey and hog litter, wet distillers grain, food waste).

Appendix A - Computations

Calculating Pounds of Manure Per Farm Per Day

https://core.ac.uk/download/pdf/38913921.pdf

"Total Manure lbs/day is a function of the weight range of the manure producing pig, the pig feed supply, and other factors." Assume 10 pounds of manure/day/pig is consistent with the amount used throughout the computations performed and presented in this submission.

In the weight of the manure there is organic matter composed of bodies of bacteria from the animal's gut, along with some partly digested feed. Carbon is present in proteins, fatty acids, lipids, carbohydrates, cellulose, and lignins.

For informational purposes only: 1 pound of HDPE plastic solid carbon captured by the Carbonic LLC technology, when expanded to Standard Temperature and Pressure (STP), will occupy 8.16 cubic feet per pound of sequestered carbon.

Carbon to HDPE Computation

https://www.gov.mb.ca/agriculture/environment/nutrient-management/pubs/propert ies-of-manure.pdf

Assume again that a pig produces 10 lbs manure/day

1,200 pigs/farm x 10 lbs manure/day = 12,000 lbs or

6 tons manure/day = plant continuous flow capacity/day

90% moisture content

10% dry matter (DM) content = 1,200 lbs DM/herd/day

5.4% of raw manure (or 12,000 lbs) is organic carbon

= 648 pounds of carbon/day OR 756 lbs of HDPE/day (based on chemist computations)

```
= $756 of organic HDPE/day
```

x 365 days = around \$276,000 of HDPE plastic containing sequestered carbon/year

This recovers original capital outlay of \$500,000 for system in approximately 2 years, excluding the monthly Carbonic LLC management fee of \$5,000

"Total Carbon" Side Notes

Compute Carbon and HDPE Production

https://umaine.edu/soiltestinglab/wp-content/uploads/sites/227/2016/07/Compost-Report-Interpretation-Guide.pdf

"Total carbon (C) is a direct measurement of all organic and inorganic carbon in the compost sample. Unless the sample has a high pH (> 8.3) or is known to contain carbonates, essentially all carbon will be in the organic form. Composted

organic matter typically contains around 54% organic carbon by weight. The carbon content of individual feedstocks may vary from this ratio."

Customer Farm Economics

https://www.ipic.iastate.edu/publications/120.ExampleProdBudgets.pdf

Pork Production Budget derived from Iowa State: \$122.87 Operating Costs \$ 10.30 Fixed Costs \$133.17 Total Costs/pig sold x 1,200 Head = \$159,804 Total Expenses We'll assume \$160,000 Income from Sales (weights approx.): 120 to 140 pounds of meat in a butchered pig 1,200 pigs x 120 lbs each (use low estimate) = 144,000 lbs pork meat/herd x 2.25/lb. of hanging weight paid to farm = \$324,000 Production Income - \$160,000 Expenses = \$164,000 Net Revenue from Production Again \$276,000 HDPE sales paid to farm - \$60,000 annual management fees \$216,000 Net Revenue from HDPE sales 164,000 + 216,000 = 380,000 Total Income

Appendix B - A Farm Selection Process

This example comes from the Carbonic LLC owned copy of the Minnesota Pollution Control Agency (MPCA) GIS database concerning over 38,000 feedlots in Minnesota, of which about 3,000 are pig farms.

	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT
1	au_count	animal_coun	primary_stock	owner	ph	contact	phone	city_m_co	state_r	huc10_name	huc12_name
5	1992	9140	Swine 55-300 lbs	Kent Lo	0		507-4	Lismore	MN	Kanaranzi Creek	Headwaters Kanaranzi Creek
6	906	3020	Swine 55-300 lbs								
7	1440	4800	Swine 55-300 lbs								
8	217.5	43500	Broilers >5 lbs								
9	214	175	>1000 lbs								
10	518	1320	Swine >300 lbs								
11	73.425	210	>1000 lbs								
12	924	308000	<5 lbs								
13	1152	3840	Swine 55-300 lbs								

Marketing and Sales Data Columns

Data columns added to each data row are used by sales associates when contacting customers. Data is gathered for initial contact and for subsequent contact. The database provides a simple way to reach out to known customers/pig farmers who are recognizable by their data patterns. Then it is easy to perform simple analytics to help figure out which sales campaigns provide the best outcome.

Row 5 tells an interesting story from columns (GJ) through (GT). A man named Kent (GM) owns a pig farm located in Lismore, MN (GQ, GR). He was in the news recently explaining why he had to euthanize about 10,000 pigs (GK). The pigs couldn't be processed because of disruptions in the pork processing industry. The au_count (GJ) tells the weight of Kent's herd of swine in the 55-300 lbs range (GL) comprising 9,140 pigs (GK). Furthermore Kent's pig farm is located on the Headwaters of Kanaranzi Creek (GT) in the Kanaranzi Creek (GS) watershed. More information is available in the database about Kent's farm.

Appendix C - Questions and Answers

Question: What is the value of pig manure to farmers vs. having to purchase fertilizer? If they turn the manure into plastic, they will need to purchase fertilizer.

National Hog Farmer

https://www.nationalhogfarmer.com/mag/farming manure isnt waste

"Cashing in on Manure's Value" is a great what if analysis of the value of manure when sold on the open market. Large tanker trucks arrive at the manure lagoon where they pump the contents into their tankers and haul it away. Sounds pretty simple. Sell the manure to be processed elsewhere. Buy fertilizer to replace the plant nutrients in manure which is no longer available.

Suppose instead that the manure could be spread on the crop farmland in the reduced form of #ManureGasPlasticTM byproduct ash. Rather than spreading the fertilizer in the form of manure, such as is commonplace these days, the ash, which is collected as a byproduct each day from #ManureGasPlasticTM operations are spread instead. What remains in the ash came from the swine manure and contains all 13 of the essential plant nutrients that are used by plants. These include nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S), manganese (Mn), copper (Cu), zinc (Zn), chlorine (Cl), boron (B), iron (Fe), and molybdenum (Mo). By blending in other nutrient sources a farmer could finetune the fertilizer to the specific crop's needs and spread it on the land.

Question: What is the cost to produce one pound of plastic through typical oil/chemical based processes? How does this compare to $\#MGP^{TM}$?

HDPE Prices

A check on recent HDPE prices show prices as low as \$0.40 per pound a year ago and recently as high as \$1.25 per pound. It might appear as if the farmer could simply sell their HDPE to the highest bidder. But wait! There is more to the story. In the #ManureGasPlasticTM market, the HDPE is special because it has sequestered carbon locked inside derived from recently living biological sources. The Carbonic LLC certified digital stamp written to the blockchain proves the sequestration was completed. Upon completion, ownership is established and the value of \$1.00 per pound is attached to the #ManureGasPlasticTM created plastic. The \$1.00 signifies the fixed price of sequestered plastic. This fixed market price can be adjusted upward in notches based on a proprietary algorithm applied to factors like the net increase or decrease in the atmospheric carbon emitted into the atmosphere by human controlled behavior.

Question: What is the market size for Plastic bricks? Plastic Lumber? Plastic Pellets? Are the bricks and Lumber approved in building codes? https://www.greenbuildermedia.com/blog/the-promise-and-pitfalls-of-plastics-in-c onstruction

"The Promise and Pitfalls of Plastics in Construction" which says "plastic wood has many of the desirable durability qualities of pricey (and sometimes endangered) South American and Asian wood species such as attractive and durable, teak and ipe woods."

https://american-plasticlumber.com/wp-content/uploads/2016/11/APL-lp-HDPE-Sh eet-Typical-Properties.pdf

American Plastic Lumber, Inc. sells its 3/4-inch-thick recycled plastic "sheet goods" (imported from Asia) which have the characteristics in the previous pdf file.

Appendix D - Useful References

What is HDPE

https://en.wikipedia.org/wiki/High-density_polyethylene

High-density <u>polyethylene</u> (HDPE) or polyethylene high-density (PEHD) is a <u>thermoplastic polymer</u> produced from the monomer <u>ethylene</u>. It is sometimes called "alkathene" or "polythene" when used for <u>HDPE pipes</u>.^[11] With a high strength-to-density ratio, HDPE is used in the production of <u>plastic bottles</u>, corrosion-resistant piping, <u>geomembranes</u> and <u>plastic lumber</u>. HDPE is commonly recycled, and has the number "2" as its resin identification code.

HDPE Sheet Material

https://www.acplasticsinc.com/informationcenter/r/what-is-hdpe-sheet What is High Density Polyethylene Sheet (HDPE Sheet)?

Plastic Lumber Capabilities

https://rescoplastics.com/resources/plastic-lumber-capabilities/

"Normally HDPE has a poor resistance to UV, a segment of sunlight. Milk jugs are made from HDPE and designed for a short shelf life. After all, they are made to contain perishable food. The whitish, translucent appearance is the natural color of HDPE. If milk jugs are left outside for a few months, even worse in direct sunlight, they will degrade to such an extent that you can crumble them easily with your hands. Things change for the better when during manufacturing colorant has been added. The small platelets of the colorant prevent the harmful UV from penetrating deep into the plastic. However, the color of the colorant has a major impact on the protection that is achieved.. If the manufacturer included a generous amount of white colorant, items such as white buckets used around the garden can last for quite some time." (editor: corrected minor edit errors in quote)

Carbon Black UV Screen

"**Carbon black** is the most effective **screen against UV** and perhaps the best **weathering stabilizer** available. If black is not an option, light stabilizers should be added that either absorb light or quench the detrimental chemical reaction caused by UV."

Carbon Black HDPE

https://www.azom.com/article.aspx?ArticleID=16642

"Mixing Carbon Black with Polyethylene Pellets"

"Generally, **conductive carbon black** is employed in a variety of **polymers** to achieve permanently dissipative, antistatic, or **electro-conductive** properties in paints, plastics and rubber. The carbon black not only influences **thermal and electrical conductivity** but also impacts the coloration and **electromagnetic properties** of varnishes and paints and even the coloration of rubber and plastics. Blown and cast films, extruded profiles, sheets, pipes, and injection-molded parts are common application areas"

Food for Thought

As this Business Plan #BIZ draws to a close, we on the teams of Carbonic LLC, of Woodbury, MN wish you farewell. Within the sentiment of Thanksgiving USA 2021, we thank you and leave you with food for thought. Think about the impact on global climate that Carbonic LLC a #ManureGasPlastic[™] world, to the extent that keeping human caused carbon should, with the exception of breathing, be kept out of the atmosphere.

Increasing profitability, supporting/creating industry, outputting a needed material/resource. We want to leave you with some closing thoughts, mostly about the connection between innovation and STEM Education and/or Arts Education.

Job Creation

Creating jobs for Chemical Engineers, Mechanical Engineers, Construction Workers, Welders, and Farmers AND from STEM there come students trained in the sciences, technologies, engineering, and mathematics

Crowdfunding Reg-CF Portal

https://carbonic.sppx.io/ https://carbonic.live/ https://gis.carbonic.live/

Brands and Trademarks

#ManureGasPlastic™ #MGP™ #CAR™ #CARpool™

THIS: END CAR-1174-01 Business Plan (#BIZ)

BEGIN CAR-1147-01 What PROBLEM do you think you are solving

Carbonic LLC Problems Being Solved

Every Person Needs A Purpose

There are short-term human purposes that are useful means to an end (for example, finding food, a bathroom, and a bed for the night). There are long-term useful purposes that are more aspirational (like, completing an education and finding a job). There are dormant purposes awaiting an inspirational spark; seeking to be of service to humanity. The homeless, unemployed, underemployed, unemployable, or exploited need help. How about mental illness, substance abuse, and lack of needed services? Carbonic LLC provides data, information, and content that serves these human purposes in these areas by spotlighting plastic housing for everyone, including the homeless and the poor. Promoting plastic housing is a market niche filled by Carbonic LLC. Carbonic LLC must support the market for pig manure derived plastic products to make sure that pig farmers have customers for their plastic. What better material purpose exists for pig manure than joining an ever growing plastic energy/material sink? The Carbonic LLC certified plastic sink becomes the source of the plastic needed by the plastic housing industry.

Some People Need a Change

As a personal inventory, how much do you love your job? Do you end each workday feeling happy and fulfilled? Have you made a beneficial difference in the lives of others today? Are you confident that you are in the right career and the right position with the right company? Are you focused on activities that matter to you? Are you using your strengths? Are you effective? Are you realizing your full potential? Do you have time available to help Carbonic LLC sometimes?

Whatever your answers, please consider the Carbonic LLC alternatives. You will find opportunities for volunteering to help other people and teams with their projects and tasks. If a project task captures your interest, explore it. If you can help, consider doing so. You must be qualified to do the work. You must have the time flexibility in your life to undertake a set of tasks spread across your intervals of time available in your schedule. Some tasks you will fit into your free time and work alone or in a co-work situation. Other tasks will require other's help. In general, you must be able to complete your tasks on time. Your work ethics and your proof of work will be judged by your peers. Their accolades and criticisms become part of your profile. You attempt to fulfill the commitments you have made and let your team lead know when you first think your assignment may not be completed on time. Beyond that you pretty much do your work when you choose. Many current Carbonic LLC workforce are working from home. Report how much time you spent and what you think it will take to complete. Then get ready for the next sprint.

Every Person Needs a Project

Everybody needs something to do that fills their time. They need something that gets them out of dwelling on their personal problems and into something big and inspirational for their brain.

Every Person Needs a Team

Solving life's problems sometimes requires a team of people to help. Carbonic LLC helps specially selected people who work on teams to complete and in the area of internships serving as a pathway to education, on the job training, resume building, money management, and time management. Team skills gained on interesting projects benefit everyone.

A Team Needs a Purpose - - Top Down or Emergence Model

Internships require Intern produced works to be reviewed by team peers and team leaders. They judge the work and recommend interns for upgrade to contractor positions. When a team's purpose is defined and adjusted from the top down, then

social order emerges from the orders issued by those on high. As a contrast, bottom up social order emerges which fosters adaptation by the teams based on what they learn from their interactions with the team's customer base. Evolutionary and upward growth is inspired by tapping the transformative powers of the teams within the organization.

What If #1 Purpose is Housing and Subsistence Living

Imagine being homeless. Always on the move. Children in one school after another. In need of safe housing for family members. The top five causes of homelessness among unaccompanied individuals are (1) lack of affordable housing, (2) unemployment, (3) poverty, (4) mental illness, and (5) substance abuse. The general lack of needed services is the problem.

At Carbonic LLC, plastic housing and outbuildings are part of the big picture of solving homelessnes while sequestering carbon in a #ManureGasPlasticTM Carbonic LLC plastic sink creator. Mix in a few HDPE outbuildings and a person could create a few pig pens and get into the pork producer business. If not pork, maybe chicken fryers, chicken layers, feed beef, dairy cattle, turkeys and other livestock that produces manure. As a result, a small agricultural community and economy might emerge. It is mostly a question of potable water or water that can be made potable for humans and animals. It is also a general question of water for livestock animals and plants.

People Need a Change

While most Americans think climate change is an important issue, they just don't see it as an immediate threat. A national Pew Research Center poll concluded 75 to 80 percent of respondents said that climate change is an important issue. But respondents ranked it last in a list of 20 compelling issues, such as the economy or terrorism. Anytime something fundamental is changing, people tend to experience feelings of uncertainty, mistrust, denial, undervaluing risks, lack of control, and getting stuck in habits. Getting people to "go green" requires looking at psychological barriers to change and what leads people to action.

We Must Care About Sequestering Carbon

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere. A carbon sink is any reservoir, natural or otherwise, that accumulates and stores carbon dioxide or some carbon-containing chemical compound for an indefinite period of time. Carbon sinks lower the concentration of carbon dioxide in the atmosphere.

Understand and Believe

It is important to understand it is better to capture carbon at its source rather than attempting to capture it prior to the carbon gases entering the atmosphere. Carbon capture and storage technologies greatly reduce greenhouse gas emissions, even allowing utilities to keep using abundant and efficient fossil fuels to generate reliable and affordable power. Carbonic LLC plans to build wondrous technology that thermodynamically converts pig manure into human safe plastic. This technology captures carbon before it enters the atmosphere. It solidifies that carbon in plastic where the carbon can be safely sequestered for centuries.

Urgent Action

Urgent action is needed. Dumping carbon into the atmosphere must be reduced; we must use carbon gasification technology instead. Gasification is a technological process to convert any carbonaceous (carbon-based) raw material, such as coal, into fuel gas, also known as synthesis gas (syngas). Sequestered carbon-filled plastic is produced from syngas. Gasification is a solution for renewable syngas production. Carbonic LLC technology inputs biomass, gasifies it, and produces plastic or other carbonic materials, heat, steam, and other non-sequestered products. Plastic building materials will revolutionize the housing industry. The Carbonic LLC technology transforms pig manure into a new income stream for the farm. Maybe more small farms will thereby be able to survive.

Help Is On The Way

Carbonic LLC is focused on delivering manure to plastic technology to pig farmers. We are not in competition with alternative carbon capture solutions, we are here to augment all existing carbon capture and storage solutions that are affordable and effective.

People Love/Hate Plastic

People love plastic for its convenience and hate plastic for its trash. At least 8 million tons of plastic end up in our oceans every year. Floating plastic debris is currently the most abundant item of marine litter, accounting for 80% of all marine debris on the surface or suspended below. The average American creates 4.4 pounds of trash every single day. That's roughly 728,000 tons of trash per day. About 12% of trash is incinerated for electricity. Much of the remainder ends up in landfills.

1. What PROBLEM do you think you're solving?

Solve Pig Manure Problems

Turning pig manure into plastic is a great way to capture and sequester carbon so that the captured carbon does not pollute our atmosphere and our waterways. Turning pig manure into plastic provides long term storage of the carbon in a carbon sink, meaning the carbon can last for centuries or it can be easily recovered and used as heat or fuel. The plastic can be used as raw material for the plastics industry. This provides a much better solution to the pig manure pollution problems because the resulting plastic is safe for humans to handle and use for food storage containers.

Does The Technology Work

The number one question people ask, after hearing about the problem being solved, is "does the technology work?". Can we really turn pig manure into plastic? The answer requires \$800,000 money to build a prototype that proves that the process works at scale. As is often the case with new and innovative technical solutions,

Page 56

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

the process must first be proven in a laboratory. After that the technology must be proven by building a workable prototype with a limited production capacity. Then the technology must be proven at a capacity sufficient for commercial sale and operation. It's one thing to process small manure samples. It is quite another to run continuous flow pig manure gasification technology which is producing intermediate syngas from tons of pig manure per day. Over 5 tons of manure per day is produced by each 1,000 pigs. The technology must be reliable because pigs do not stop producing manure just because the plant

Our Vision: Human Housing and Other Outbuildings

The sunk plastic will be salable and put to good use. Carbonic LLC proposes that HDPE plastic containing sequestered carbon will be used to build plastic housing. As a pig farmer, an income stream upwards to \$250K per year can be realized from the sale of HDPE plastic pellets, the size of rabbit feed, to the construction industry. We also propose that HDPE plastic be used to build outbuildings. Imagine building additional pig barns using the plastic output from the pig manure supplied by your own facility! Estimates are that two years of manure-to-HDPE plastic from an average sized herd will produce enough plastic to build a new pig barn, effectively doubling the size of the herd and thus the farm's production of plastic for the sink.

Our Vision: Plastic Packaging for Human Food

In a Carbonic LLC food store everything is different. Let's take milk for an example. We know that the manure from dairy cattle will have ended up in the carbon sink almost before the milk is boxed. It feels good to know the carbon cycle is complete for every product. There are no glass containers or metal containers. There can be a clean creamery near the milk source, perhaps on the farm itself. Each milk box can be serial numbered by an RFID tag built into the plastic box. Milk can come in resealable plastic boxes that stack neatly on store shelves and in refrigerators. When the lid is closed on a spent milk box, it can be conveniently tossed into a nearby plastic container used for recycling milk container boxes, and other food boxes.

Because the entire food supply is stored in plastic boxes it will be better able to withstand a tumble or bump during storage and handling. We are talking about universal sized food containers in 1, 2, 4, 8, and 12 person sizes. For example, there are half pint, pint, quart, and gallon sized plastic milk boxes, same as currently exist. There will only be plastic boxes, and no waxed cardboard trash. We want no trash when we can use a recyclable plastic box instead. The same sizes are usable to pack wild tuna and salmon, as well as all farm raised fish. Canned meat, vegetables, and cheese will be in plastic. When you get back from vacation you can simply throw expired food into the recycling bin along with other empty boxes of food. For many households everything in sealed plastic will go into the recycle bin instead of the trash. Everything else including cans and bottles must be dealt with in better ways. Plastic packaging will be universal in the food supply chain creating major changes as a result in the domestic and international marketplace. Our food supply chain is altered for the better. It is far better to open the lid of a picnic basket and find it filled with unopened plastic food boxes which, when emptied of their contents, can be dropped in the recycling bin on the way out of the picnic area.

Solve Carbon Pollution Problems

Carbonic LLC will help solve pollution problems in the air, water, or on land by deploying our portable technology, which we created to solve rural community carbon waste problems, anywhere it is needed. In a similar vein, business and governments also need better solutions to the problem of carbon based waste. Rather than landfills filling up with waste, Carbonic LLC seeks to deliver small scale targeted biomass gasification solutions wherever they make sense.

2. What are people doing right now (including doing nothing) to solve it?

Solve Consumer Needs for a Single Human Store

Incorporate separated trash and recycle instead. Plastic is easily recycled. Milk companies are not using paper milk cartons anymore. Manufacturers are already

Page 58

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

turning to more plastic packaging. Old non-plastic packaging is going away. Shipping and handling right sized plastic boxes makes good sense in any supply chain. From manufacturing and transportation of the goods all the way through the supply chain that ends in our cupboards, refrigerators, and freezers, plastic boxes are neatly stackable enough to satisfy any box filing system. Pour the contents into a pan and toss the plastic box into the recycle trash. Got food waste? Put it into a sealed plastic box or bag and put the food waste into a plastic container and set the box into the recycle bin. It's all biomass and it's all headed to the plant that turns consumer grade food safe plastic trash back into Carbonic LLC certifiable sequestered carbon sink plastic.

ASIDE NOTE: Documentation in a box locator system will help locate boxes within international containers shipped by road, rail, water, and air. The very same software can be used to locate boxes inside of boxes from the biggest to the smallest. It can also keep track of the boxes stored inside the pantries, cupboards, refrigerators, and freezers of a home. In summary then, leave the waste and garbage in the plastic boxes and bags. Put the boxes empty or full into plastic recycling. Get rid of cans and bottles of food and beverage. Consume plastic and recycle it. Require that the entire food supply be delivered in plastic boxes.

EPA CO2 Capture and Sequestration (CCS)

The current best carbon sink solution recognized by the Environmental Protection Agency (EPA) defines carbon dioxide (CO2) capture and sequestration (CCS) as a set of technologies that can greatly reduce CO2 emissions from new and existing coal- and gas-fired power plants and other large industrial sources. CCS is a three-step process: 1) CAPTURE of CO2 from power plants or industrial processes, 2) TRANSPORT the captured and compressed CO2 (usually in pipelines), and 3) STORE CO2 underground by using geologic sequestration into deep underground rock formations.

Piping CO2 Can Be Dangerous

On Saturday, February 22, 2020 at around 7 PM, in a heavily wooded area off Mississippi 433 near Satartia, Mississippi, a pipeline carrying carbon dioxide and hydrogen sulfide burst. The pipeline released CO2 into the air, causing people to "act like zombies," said a first responder. More than 300 people were evacuated from their homes and 45 were sent to two area hospitals. CO2 is heavier than oxygen, so we might expect every CO2 molecule to sink below a layer of oxygen molecules. As the liquid CO2 settles into low lying areas, people breathe the concentrated carbon dioxide and cannot get enough oxygen. Brain cells are extremely sensitive to oxygen deprivation (hypoxia), and can begin to die within five minutes after oxygen supply has been cut off. When hypoxia lasts for longer periods of time, it can cause coma, seizures, and even brain death.

The Carbonic LLC Solution is Philosophically Very Different

The Carbonic LLC solution is not generally disruptive to the way the problem is handled today. It is basically wide open, an adjunct to something else, and does not compete with existing alternatives. We leverage a biological process endemic to the life of an animal. We are symbiotic, meaning we benefit from one another. We receive the benefit of using the fossil fuel industry's pre-existing technology and the carbon sequestration industry benefits by utilizing our unique technology built snugly into a transportable shipping container.

Those Who Are Doing Nothing

We seek to do good or at least seek to do no harm. Seeking to do good is what many people do. What some people are doing (or not doing) right now is harmful to varying degrees. Rather than solving the excess carbon problem, people are currently filling landfills, waterways, and the atmosphere with carbon waste. Carbon in the atmosphere is believed by the scientific community to lead to global warming. To some people nothing should be done and everyone has a right to their own thoughts and opinions. Some people have little interest while others have great interest in having the sustainability conversation.

The Polymer Industry

An unfortunate side effect of all this is that the polymer industry has become the accidental stepchild of the petrochemical industry. They deliver plastic produced from fossil fuel and not from a biological source. We at Carbonic LLC are going through the steps of creating a new industry by developing a carbon sourced plastic which will be bought and sold in a Carbonic LLC market, complete with transactions logged in a blockchain. To preserve organic source sequestration, we will use an unending supply of manure to create plastic carbon sinks. The carbon is sequestered in HDPE plastic which will be used to build houses for the homeless or monster houses for the wealthy or additional outbuildings right on the farm where the plastic is produced. Polycarbonate windows and HDPE walls will be used from basement to the roofline. Those are a few of the things that Carbonic is seeking to do right now in an attempt to solve the carbon problem.

3. What unfair competitive advantage or unmet need have you discovered?

Unfair Competitive Advantage

Is there some unfair competitive advantage that exists in the pig manure to plastics industry? Having considered the question we found that, more than a competitive advantage, Carbonic LLC has advantages that will emerge with an adequate capital raise.

The pig manure to plastic market is stabilized because pig manure, and manures in general have less of a competitive race because the limited supply of pig manure is finite which creates a specialized market niche with elevated demand. The supply of fossil fuel, on the other hand, provides a virtually limitless supply of oil industry produced plastic which competes in the general plastics market.

We have discovered that the established fossil fuel industry has vast wealth available to it and deep pockets for the politicians. Oliver, my mentor, used to say

"If you have enough money, you can buy politicians like a regular person buys a sack of potatoes."

Unmet Need

We have taken note of unmet needs in the area of education about basic science that is taught in STEM and Arts courses. It is because people lack the motive, money, and time to pursue. With a simple search of the internet, vocabulary and understanding can be gained. Attaining a solid STEM education is essential for earning good salaries and benefits through steady, full-time jobs. Training in the Arts is helpful for finding something that you LOVE to do. STEM is the way to get it done.

4. What is your plan to get people to change their behavior to do it your way?

Rather than a gargantuan centralized gasification plant designed to gasify the manure of 30,000 hogs at one centralized processing facility, Carbonic LLC takes a different approach using decentralized processing. We have determined for every herd of 1200 pigs, one of our units is needed. This would mean a 30,000 pig farm could supply 25 units with the desired amount of manure for the gasification process with an output of plastic or other alternative outputs.

Income for Farmers

We need a solution that puts money in farmers' hands. Carbonic LLC technology does that to the extent that costs are fully covered from carcass sales plus HDPE plastic pellets sold at an estimated price of \$1 per pound. HDPE revenue would add to the bottom line about \$250,000 for a 1,200 pig herd. The farmer will purchase their equipment and support from us. There is a measurable income opportunity in the ash, as well, by capturing this and other byproducts which will be sold into the market.

DEFINITION: What is a Biological Carbon Sink

Reservoirs that retain carbon and keep it from entering Earth's atmosphere are known as carbon sinks. At Carbonic LLC, we believe the plastic created from pig manure is the best sequestration solution available because the plastic sequestration can last for centuries. Our sequestration results in a tangible, common, solid plastic material that can be very useful. When the retained carbon is from biological sources, like pig manure, a biological carbon sink results. When the retained carbon sink results.

A forest sequesters carbon too but the sequestration effect diminishes over time. Forests are sustainable but only with a willingness and conscious effort by humans. A plastic carbon sink persists when the plastic is melted into different forms. Time after time the plastic sequestration persists. Much of so-called carbon sequestration is nothing more than a shell game, and usually is all about the money which tends to let the sequestration value dwindle over time.

PROBLEM: How to Build a Biological Carbon Sink

Carbonic LLC's technology helps solve the carbon problem by providing a novel carbon sink solution where carbon can potentially be sequestered for centuries. A thousand years of real carbon sequestration ought to be long enough for humanity to figure out how to handle the atmospheric carbon imbalance. Providing a good long term biological carbon sink is an essential part of the overall carbon control strategy.



Page 63 © 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Carbonic LLC hopes to build the first manure-to-plastic sequestration prototype by raising \$0.8 million. The first production machine will sell for \$0.5 million plus a contract for \$5,000 per month covering maintenance and support.

Build a Biological Carbon Plastic Sink

Every day on a small pig farm, 6 tons of raw manure becomes about 800 lbs of the ever accumulating Carbonic Biological Carbon Sink; this could produce a veritable ocean of sequestered carbon locked in plastic. When carbon is sequestered in plastic, it doesn't pollute the atmosphere as carbon-dioxide. The carbon is not lost to the apparatus and process.

By building a biological carbon sink, Carbonic LLC technology will create a sustainable source of plastic to be used for human purposes while preserving its carbon sequestration value. So long as livestock is raised for profit and human consumption, there will always be manure. The Carbonic plastic sink represents the best sequestration solution. As the carbon sink grows over time, humanity will gaze in awe at the wonder of carbon locked in plastic rather than having been spewed into the atmosphere.



Page 64 © 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CAR-1174 Jan

Plastic is an Energy Sink and a Carbon Sink

Pig manure sources and plastic sinks have to be included in the energy accounting for the energy flowing into and out of a system. But once plastic has been sequestered it can be melted and formed into new shapes without losing its sequestration value. Basically, plastic remains in an energy sink status until it is either gasified down to carbon monoxide syngas or combusted all the way down to carbon dioxide gas. The plastic's inherent energy sink value and material sink values reduce to near zero. That is until the carbon dioxide meets its match with some other way of capturing the carbon dioxide before it enters the atmosphere.

Capture Carbon Near Its Source

The big picture strategy includes the goal to avoid adding carbon to earth's atmosphere, waters, and land. The Carbonic LLC proposed solution is to capture carbon and sink it into plastic. Sink plastic into livable and safe housing. Seek to assure every human has safe plastic housing at the very least. A place to call home for the night.



5. When do you break-even doing it?

What Products are We Talking About?

- 1. The \$500K manure to plastic unit
- 2. The 1% (\$5K) per month maintenance and support
- 3. A \$1/lb or more manure to plastic sequestration event
 - a. At some future date, based on availability plastic product production
 - b. Generally fulfilled on a first-in/first-out queue of sequestration events
 - c. Plastic tons (2,000lbs.) are a useful measure of sequestration
- 4. A finished product comprises some number of pounds of carbon sink sequestration.
- 5. A CAR token represents one pound manure produced by a given manure to plastic \$500K unit. That way fossil fuel produced plastic will not qualify for inclusion in the finished blockchain proving ownership.

We Break Even When Enough People Believe

One pound of HDPEcan be valued at a \$1 fixed price per pound.

6. Is your team the one to pull it off?

YES, as evidenced by this Business Plan

Silicon Prairie High Five

- 1. What PROBLEM do you think you're solving?
- 2. What are people doing right now (including doing nothing) to solve it?
- 3. What unfair competitive advantage or unmet need have you discovered?
- 4. What is your plan to get people to change their behavior to do it your way?
- 5. When do you break even doing it?
- 6. Is your team the one to pull it off?

Page 66

© 2022 Lyno Sullivan and Carbonic LLC, Woodbury, Minnesota CA

References

These documents contributed content to this document.

END CAR-1147-01 What PROBLEM do you think you are solving

CAR-1147-01 What PROBLEM do you think you are solving

CAR-1127-01-MN-CUP-2021-Application

CAR-1131-01-ACTIVE-Final-as-of-20210721-Carbonic-LLC-MN-Cup-Summary -Business-Plan

CAR-1147-01 What PROBLEM do you think you are solving

CAR-1131-02-ACTIVE-2021-Investor-Deck

As of December, 5, 2021, Lyno Sullivan is Founder, Governor, President, and only Management member.

CCX1409 (ACTIVE Rev 1 DIY Lyno Sullivan, Biography, Resume, Ideas, Inspirations, and Stories from Life)

THE END