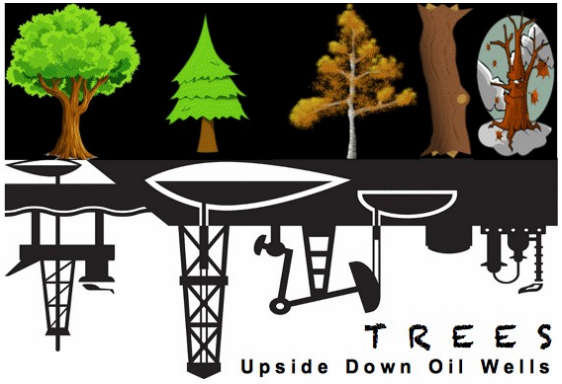
Proposal to Change Global Agriculture Overnight

Hydrogen Powered Greenhouses



How Do You Fix a Political Problem that Cannot Be Changed Politically
Figure Out How to Power Millions of Greenhouses Globally Differently
Engineering, Technology, Science, and Social Media, Plus Grow At Night

Climate Change is Collapsing Global Truck Farming

Climate Change is Changing Where you can Grow Food Outdoors in Dirt

Global Agriculture Supply Chains are Affected by Climate Change - So

How do you Feed 7 Billion People Everyday – Move Crop Production Indoors

But How do you Power Millions of Greenhouses Locally, Globally

How do you easily massively sequester CO_2 on a Global Scale

How do you Reduce Global Agriculture Fresh Water Use by 90%

- Currently Agriculture uses 70% of Global Fresh Water & Emits 25% Global CO2

Climate Change JUDO - Move Crops into Millions of Greenhouses Locally Globally Powered by Trees

Charm The Public into Plant More Trees Globally + Use Biomass Gasification to Produce Hydrogen Locally to Feed Them

Capture the Heat of Producing & Compressing Hydrogen to Heat + Cool Greenhouses (Co-Gen)

Use Biomass2Hydrogen to Power Millions of Hydroponic & Aquaculture Greenhouses Locally, Globally

Trees Capture CO2 & Produce Excess Forest Biomass to Power Greenhouses - DUH

Trees – The Ultimate Solar Panel to Power Millions of Indoor Farms Globally, Locally

Climate Change JUDO - No It's Not the Economy, It's Food Stupid – No Food – No Economy

So How do you Power Millions of Indoor Farms Globally Locally

Solution - An Integrated System on 20 Acre Site Combining a 100TPD Biomass Gasifier, Hydrogen & CO2 Capture Membranes, H2 & CO2 Compression & Storage, Thermal Energy Capture & Storage, & a Sealed LED Lit 10 Acre Growing Area Co-Gen Controlled Environment Agriculture Indoor Farm. ***Trees Capture CO2 + Can Power Millions of Local Indoor Farms Globally***

Biomass Gasification Produces ***Green Hydrogen + Heat***

100 Ton/Day Excess Forest Biomass from Managed Forests or Urban Woody Biomass or Short Rotation Woody Crops (SRWC) Produces ***2000Kg/Day*** of ***Green Hydrogen = 66 MWH MicroGrid*** Plus ***22 MMBTU/Hr*** of Thermal Energy (**Heat**) Captured into **Thermal Energy Storage** (TES) + *Controlled Environment Agriculture* **(CEA)**

TES is used to Space Heat, Cool, & Humidify a **10 Acre LED Lit Indoor Farm**

DOE calls Biomass ***Gasification***2***Hydrogen*** a Mature Technology (TRL9)

Greenhouses are a Mature Technology (TRL9) – Project Connects The Parts

The Problem / Opportunity is to Change How Greenhouses are Powered

How Do You Power Millions of Indoor Farms Globally Locally Plant More Trees Globally, Manage Forests + ***Biomass2Hydrogen***

Social Media Campaign – Charm John Q Public Globally into

It Might Be a Good Idea to Start Growing Food Indoors – Climate Change

Build Greenhouses Locally Near You Powered by Trees Near You –

To Feed You Locally - So Please Stop Burning Down The Rain Forests

Problems with the status quo

Global Truck Farming is Collapsing due to Climate Change

Climate Change is Changing Where you have Water, Soil, & Weather To Grow Food Outdoors to Truck2Customers

Your (You) Food Supply is Affected By Climate Change

Ten Day Shelf Life Crops are Trucked Thousands of Miles

Where does Your Food Come From (Lettuce, Spinach, Strawberries, Tomatoes)

Climate Change is Affecting the Global Supply Chain for Everyone's Food & Yours

Most Greenhouses & Vertical Farms are Grid Connected

There is Not Enough Fossil Energy on the Planet to Power Enough Greenhouses to Feed the World

The Global Population is Increasing while The Number of Farmers is Decreasing

Project Produces Hydrogen + Creates Millions of MicroGrids + New Indoor Farmers Locally, Globally

Deforestation for Farmland is Accelerating Climate Change

Forests are Being Burned Down For Farmland for Truck Farming

Truck Farming is Collapsing due to Climate Change IT IS Accelerating

Your Food Supply Chain is Affected – How Important is That

But, How Do You Fix That Problem – An Integrated Solution – Not A Widget

The State of California relies on Agriculture Guest Workers To Feed California

Almeria in Spain has 78,000 Acres of Greenhouses but Still Uses Agriculture Guest Workers

What is Wrong with that – Your Food Supply is Collapsing due to Climate Change

How Do You Create Millions of New Indoor Farmers Who Are Not Guest Workers – Local Greenhouses Globally

No, It's Not The Economy – Without a Stable Sustainable Global Local Food Production Infrastructure – There is No Economy

Carbon Sequestration
1 Mature Tree can Capture ~48 #/Year of CO2 -- 1 Million Trees ~ 20,000 Acres of Forest
1 Million Trees can Capture 24,000 Tons/Year of CO2

128,000 Trees from a 30 Mile Radius of Delivery (1.8M Acres) can Sustainably Produce
100 Tons/Day of Excess Biomass – Cost of Biomass = $0 to $100/Ton = $0 to $10,000 per Day

100 Tons/Day of Biomass can Produce 2000 Kg/Day of Green Hydrogen + 21 MMBTU/Hr Thermal Energy
21 MMBTUH of Thermal Energy can Control the Environment in a 10 Acre Sealed LED Lit Vertical Farm
Carbon Ash from Biomass Gasification is Mixed with Water Bath Emission Capture & Returned to Forest
25Ton/day (9125 Tons/yr/Site) Carbon Ash Sequestered @ $15/Ton = $375/Day

Carbon Sequestration + **Reduction of Pollution & CO2 Emissions from Agriculture** + **Wildfire Reduction**
Agriculture Water Use Reduced by 90% + Global Food Transportation Reduced 100 Fold + **New Jobs**

Biomass2Hydrogen Production Employees
25 Employees, 5 employees/Shift @ $20/hr, 120 Man-Hours/Day = **$2400/day**

Hydrogen & Thermal Energy Output
2000 Kg/day Produced @ $5/Kg = $10,000/Day - 1000Kg/day Excess for Sale to Microgrids = **$5000/Day**
Thermal Energy Captured = 24 MMBTUH * 24 Hours = 576 MMBTU per Day @ $5/MMBTU = **$2880/Day**

Co-Located 10 Acre Greenhouse Output
Lettuce 1 Acre Vertical Farm can Produce 25 Heads of Lettuce/sqft/yr vs 0.4 Heads/sqft/yr Truck Farmed
1,089,000 Heads of Lettuce/year @ $1 / head = $2.18 M per year = **$2983 /Acre/Day X 10 = $29,835**

Strawberries – 60,000 Plants/acre X 2 Pounds/Plant = 120,000 Pounds/acre @ $3/Pound = $360K/Acre/yr
A **10 Acre** Hydroponic Strawberry Greenhouse = **$9863 /Day**

Tomatoes @ 40 #/SF = 1.74M#/yr/acre @$3/pound = $5.2M/yr/acre = **$14,321/day/acre**
10 Acres = **$143K/Day**

Greenhouse Employees Owners – 10 People per acre X 10 Acres = 100 Employees covering 1680 MH/Wk
2 People per shift per Acre @ $20/hr = 48Man-Hour/Day = **$960/day/Acre** X 10 Acres = **$9600/Day**

Triple Net Leasing of Turnkey Greenhouse Space
1 Acre = 43,560 SF @ $1.50/SF/Year = $65,340 = X 10 Acre = **$653,400/year** = **$1790/day**

Costs

Biomass2Hydrogen Site Labor Cost (120MH/day) = $2400/day
Site Biomass Cost = $0 to $10,000 /day
$30M CapEx for Site / 20 yr = $4109/day
Total = $16,509/day

Revenue

Hydrogen Production = 2000Kg/day @ $5/Kg = $10,000/day
Thermal Energy Production 576 MMBTU @ $5MMBTU = $2880/day
Carbon Sequestered @ $15/Ton = $375/day
$15M Depreciation @ 10 year = $4109/day
$15M Depreciation @ 5 year = $7945/day
Triple Net Lease Greenhouse Space = $1790/day
Total = $27,099/day

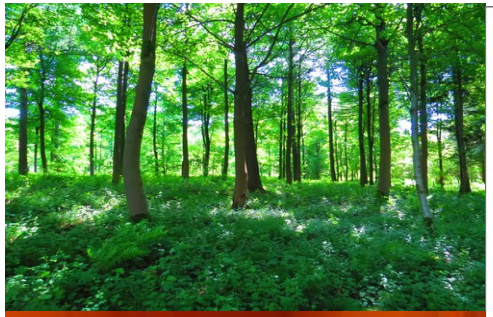
Profit

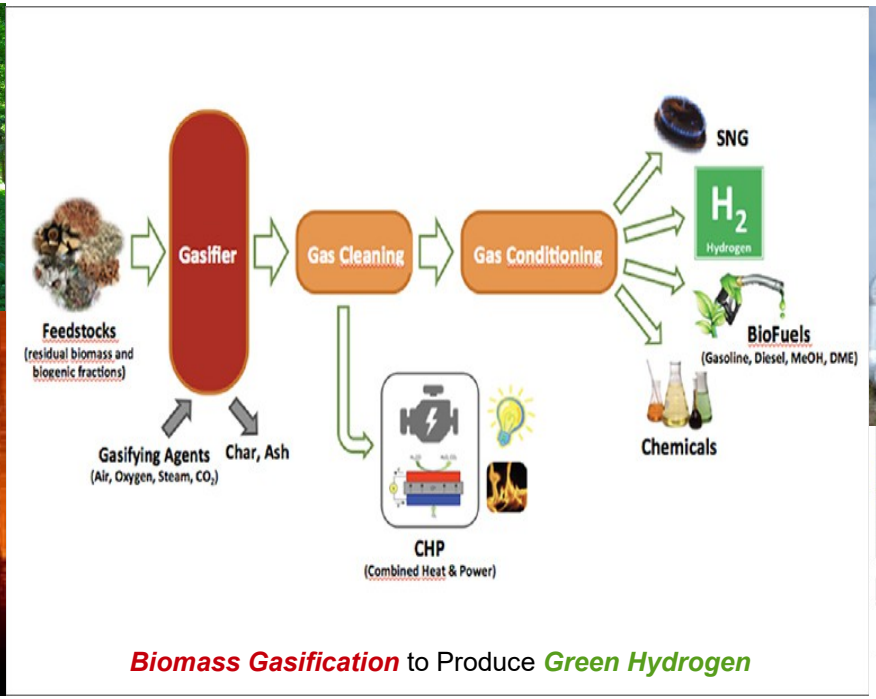
Revenue $27,099 – Cost $16,509 = $10,590/day X 365 = $3.8M/year
$30M Finance Cost @ 10% = $3M /year
Total = $0.8M /year

Hydrogen Production Site cost - $28M

Blueprints, Permits -	$2.5M
100 TPD Gasifier -	$3.4M
H2 Water-Gas Shift, Reform	
Heat Recovery Chamber -	$2 M

Hydrogen Recovery -	**$1M**
Metal Hydride, TES -	**$4M**
Compressors -	**$2M**
Fuel Cell, ORC -	**$4M**
On-Site Buildings -	**$5M**
Land -	**$100K**
Construction, Installations -	**$4M**





Biomass Gasification to Produce ***Green Hydrogen***

https://www.energy.gov/eere/fuelcells/hydrogen-production-biomass-gasification

100 TPD Excess Forest
Biomass from Managed Forests

We Change Global Agriculture Overnight Because We Grow @ Night

Features

What makes your technology special in its design? ***It Connects Simple & Commercially Available Technology to Produce Hydrogen, Creates its Own Hydrogen Powered Microgrid, & Changes How Greenhouses are Powered***

What does that enable you or the consumer to do differently? ***Technology Enables People to Grow Food Indoors Locally Globally Powered by Trees. No Electric Grid Required. Project Changes Global Agriculture.***

Benefits

How does the unique feature of your technology provide value?

Climate Change is Collapsing Truck Farming. This Technology Allows People Globally to Grow Food Indoors Locally so Everyone Can Eat At Home.

Scientific Validation - How many <u>trial/pilots</u> have been conducted?

DOE calls Biomass Gasification to Produce Hydrogen Mature

https://www.energy.gov/eere/fuelcells/hydrogen-production-biomass-gasification - Link

https://netl.doe.gov/research/Coal/energy-systems/gasification/gasifipedia/intro-to-gasification - Link

Gasification Produces 2000Kg Green Hydrogen
Plus 576 MMBTU/Day to Space Heat+Cool
Controlled Environment Agriculture CEA Greenhouse

The Eden Project -

https://www.edenproject.com/

Results of those experiments?
DOE calls Biomass Gasification to Produce Hydrogen Mature Commercially Available Technology. Biomass is Available.

Team composition – Team Members to be Added are CFO, Legal, Network Management, Energy, Agriculture

Target audience? **Electric Utilities are Customers** for **Hydrogen to Power Microgrids** to Prevent PSPS
Electric Utilities are Suppliers of Excess Forest Biomass to Keep Trees Out of Their Power Lines
People who want to be **Indoor Farmers are found via Social Media**, SBA, USDA, Farm Bureau
And You **if you want Food Grown Indoors Near You vs Thousands of Miles Away in another country**

How do you sell your product? **Hydrogen sold to Utilities** via Power Purchase Agreements
Triple Net Leasing of Turnkey Indoor Farm Space – **Shops in a Shopping Mall that Grow Food Indoors**

What kind of people are you trying to reach?
The Public has to Realize Climate Change is Collapsing Truck Farming which Currently Feeds Them. Social Media **Campaigns** are used for getting John Q Public to Plant More Trees to Power more Greenhouses **to Grow Food Indoors near them Locally, Globally**. We have all the Technology. Now It's Selling the Idea.

Business Model
The Project requires a **Hybrid Business Model**. Biomass is accepted from the Public, Corporations, & Government on a Paid (TIPP) or Paying For the Renewable Fuel to **Produce Hydrogen** making us a Customer. **Hydrogen Produced** from Biomass is **Sold to MicroGrid Operators** such as Electric Utilities & Corporations. **Hydrogen & Thermal Energy is Sold** to Space Heat & Cool & Power a **Triple Net Leased Co-Located Greenhouse** making us an **Energy Supplier & REIT**. How do you sell your product? **Hydrogen sold to Utilities via Power Purchase Agreements**. H2 & Thermal Energy are Sold on Site via PPA to Power the Greenhouse & is built into the **Triple Net Lease for Greenhouse Space**.

Financing Requested
$2M is required to create a Blueprint & obtain Permits to Build the First 100TPD Biomass2Hydrogen Site. The Blueprints are Licensed, Cloned, and Used to build additional sites. The Blueprints are for a Full Size Site which can be built Globally with only a Few Local Changes Required. A Full Size Site costs $30M. Financing a Site is done using Power Purchase Agreements for Hydrogen Sale to Microgrids and for H2 & Thermal Energy Sold on site to Power the Greenhouse. The Greenhouse is Triple Net Leased and Financed using SBA, USDA, CDFA, NGOs, & CrowdFunding.

Benefits to SoCal & California

SoCal experiences Wildfires. SoCal has a lot of EVs. The IOUs spend Millions for Vegetation Management & CalFire spends $2.5B/yr for Forest Management. Forest Management costs money. But there are few places to take HHZ & EFB. The project will build hundreds of sites around CA to use Biomass Gasification on **100TPD** HHZ & EFB to Produce **2000Kg/day of Green Hydrogen**. Project **Replaces Biomass2Electric** Grid Power Plants **which Operate @ 25% Efficiency**. The project is designed to Produce H2 & Truck it under 50 miles to Hundreds of IOU 1MW SOFC Microgrids with Grid Batteries & Off-Grid Level 3 EV Charging. Project creates a Distributed Network of Green Hydrogen Production Sites Powered by Trees. Project creates a Biomass2Hydrogen Finance Model

Jobs created –

Biomass2Hydrogen Production Sites = 25 Employees/Site
Owner Operator Greenhouse Jobs = 100 New Indoor Farmers/Site
Proposed Sites = 300 Sites x 125 = 37,500 New Jobs + 54,750 Tons Green Hydrogen + Changes Agriculture

Partnering

Tree Planting Organizations, Farmers, Government, Corporations, Public, NGOs, DACs, Local Food Pantries

Information Links
Website
http://vrfarm.saladbar2000.com/
http://vrfarm.saladbar2000.com/docs/Simple7.pdf

Biomass2Hydrogen
https://www.energy.gov/eere/fuelcells/hydrogen-shot
https://www.energy.gov/eere/fuelcells/hydrogen-production-biomass-gasification
https://netl.doe.gov/research/Coal/energy-systems/gasification/gasifipedia/intro-to-gasification
https://migration.ucdavis.edu/rmn/blog/post/?id=2569
https://www.linde-engineering.com/en/hydrogen/index.html
http://www.westbiofuels.com/
https://www.1t.org/ ------ https://trilliontrees.org/
https://www.fs.usda.gov/sites/default/files/1TrillionTrees.pdf

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