The power to create renewable Carbon-neutral Ethanol

Eco Global Fuels (EGF) provides solutions to two key energy problems:

- The need for renewable carbon-neutral transport fuels (without using food)
- Sequestering waste CO_2 greenhouse gas emissions

About Eco Global Fuels

A pioneer in clean renewable energy

Eco Global Fuels (EGF) is an innovative company at the leading edge in making and producing renewable carbon-neutral fuels.

With decades of research behind us, Eco Global Fuels has harnessed cheap hydrogen and waste carbon dioxide (CO_2) to create renewable *Ethanol* and other transport energy fuels.

How do we do it? The hydrogen is manufactured using our unique intellectual property technology, making it the cheapest available hydrogen in the world according to an independently validated report. The CO_2 comes from waste emissions from gas and coal industries. We combine these gases using our unique catalysts and energy looped system, and deliver to the market place using existing infrastructure.

Our unique method reduces both CO_2 emissions and dependence on oil imports, and can reduce the use of fossil fuels. We do not use food in the production of our renewable fuels.

We have iron oxide as a by-product from our hydroxy generators, which is the necessary ingredient in the most efficient, proven and cost effective method of **CO2 SEQUESTERING** know as LAND BASED ALGAE production. With the algae we can then produce BIO-CHAR and the complete EGF CO2 sequestering has been calculated to be a staggering 130 %, no other process can achieve this

EGF's mission is to supplement the transport fuel market with our carbon-neutral renewable fuels, including ethanol. This helps with increasing shortages and rising prices in the fossil fuel market, at the same time as reducing CO_2 emissions. The new EGF technology has the potential to enable all governments to meet their renewable energy quotas and agreements in place for Kyoto CO_2 reductions.

To accomplish these goals, Eco Global Fuels will produce ethanol and other fuels, with the brand name ***SOLANOL*** fuels. We are committed to educating the world on the environmental and economic advantages of our unique, renewable and carbon-neutral energy fuel.

Business problem and opportunity

Unlike other carbon-neutral initiatives, Eco Global Fuels is set up to work in partnership with oil, gas and coal electric power industries. We convert their emissions into a renewable source of energy. In addition to helping reduce greenhouse gases, EGF has the capability to save these industries billions of dollars in regulatory fines by reducing their carbon footprint.

A win-win for all.

EGF is in the business of renewable energy

Our renewable energy technology absorbs available vented CO_2 from many industries, including gas fields and gas turbines and delivers competitive carbon-neutral fuels, without using biomass (plants or food). In the process, we save industries from generating emissions and the associated carbon taxes.

Our bottom line is we produce ***SOLANOL*** fuels and we are completely sustainable. We supply renewable transport fuels at competitive prices when compared to the rising costs and limitations of oil, and our fuels are easily integrated into existing infrastructure.

We reduce dependence on imported oil; we also reduce greenhouse gas emissions. Ours is the only process that can economically and cost-efficiently convert the sun's energy (or other renewable energy DC inputs) into liquid transport fuels, and at the same time achieve major CO2 sequestering of up to 130 %.

In the manufacturing process, for every 1kg Enviro-Hydrogen we make, we also produce 8kg Enviro-Oxygen. This is to be used as a pure 'Enviro-Oxygen' input into natural gas oxy fired gas turbines, creating a pure concentrated CO_2 flue output gas stream. This makes sequestration efficient and economic.

Number one sequestering method

A by-product of our production system is iron oxide, which is used in CO2 sequestering using ALGAE. Sometimes used as OCEAN FERTILZATION, where algae is grow in the ocean, absorbing CO2 and releasing O2. Our method would be LAND BASED ALAGE PRODUCTION, as the logistics are much easier.

Algae is 80% of the food chain, improves fish stocks and marine life. We have an excess of iron oxide, a by-product and free to be utilized in this process, making it completely economical. Algae production is the most cost effective method of CO2 sequestering and we have proven we can sequester up to 130 %. From the algae we produce Bio-Char, which keeps the Carbon in the ground and increases agricultural yields.

We also have the possibility of converting our pure CO2 stream into pure carbon black products. This form of carbon is used for manufacturing various products such as 'Black Carbon' that keeps the CO_2 on the ground, rather than in the air.

EGF can also deliver Enviro-Hydrogen to the mining industry for ore separations in place of using acid leaching.

These features combine into seriously helping to 'clean up' industries and are good for the environment. A win-win for all industries.

Comparisons

Current method of producing hydrogen

The current process is referred to as 'steam reforming' or 'steam methane reforming'. Natural gas (CH4) is passed through a catalyst reaction with an external heat source. This converts steam and lighter hydrocarbons, such as methane, into hydrogen and carbon monoxide (CO), referred to as 'syngas'. This process also produces CO_2. More separation is required to obtain pure hydrogen (H_2).

Steam reforming wholesale: using US$4.50 per GJ is US$6 per kg H_2 and producing emissions of 56kg CO_2.

Conventional electrolysis

Conventional diaphragm electrolysis technology is expensive to scale up, is unreliable, often 'clogs up', does not last long and has high maintenance levels.

Conventional electrolysis wholesale: due to increased maintenance costs, and manufacture costs of up to $100 per kg, making H_2 by this method is uneconomical.

Conventional hydrogen production

- Costs are continually rising
- Causes major CO_2 emissions
- Many countries have a new carbon tax, set at approximately US$23 per tonne
- Carbon tax will be increasing in years to come
- Production depends on fossil fuels
- Fossil fuel costs are increasing and all are non-renewable.

Eco Global Fuels makes hydrogen more cheaply than either conventional electrolysis and steam reforming, and …

- Produces no CO_2.
- Gains carbon credits.
- Produces O_2 as by-product that can be used for oxy-firing of coal powered stations and sold to industry.
- Uses CO_2 in ethanol production.
- Basic costs are stable: water and steel.
- Currently ethanol wholesales at US$0.90 per litre …
- and EGF can produce it at US$0.40 cents litre.

EGF's technology does not compete directly with Biofuels, as the market is under-supplied and governments cannot obtain sufficient renewable fuels; however we are 70% more cost effective, without subsidies.

Technical overview

- EGF's Intellectual property (IP) hydroxy generators: Proof of concept from Macquarie University, independent validation of unique IP, ultra reliable, built from low-cost materials using no expensive noble metals (as used in competition), cost-efficient making it economically achievable to scale up to refinery, proven to be durable and safe, very low maintenance, validated flow rate 162 litres kWh H_2 with 81 litres O_2 (can be easily increased).

- DC input comes from either solar panels, geothermal, wind, waste off-peak electricity, gas turbines, tidal (near future-cold fusion etc.)

- In other words- EGF can easily adapt to any DC electric input source.

- We use known industrial process of cryogenics external density separation, (separating H_2 from $O_{2)}$, makes the process cost effective and achievable.

- IP unique catalyst energy efficient looped system.

  The environmental cost-effective economics of the technology makes many industrial processes viable.

  The features above determine the successful future of Eco Global Fuels and renewable fuels for the planet.

EGF and off-peak waste electricity

Our current electricity system is based primarily on coal-fired power stations which cannot be turned on and off at short notice. There are over 370 of these power stations in the USA alone.

Using off-peak electricity
Generating power during times of peak demand (day-time) entails also generating power during off-peak times (night-time), even if there is no demand for that power at a price that covers average costs. Here we have a base load supply, which easily exceeds the demand for off-peak power at average cost, and sometimes even at fossil fuel cost. The result is that off-peak power must be heavily discounted, and even so, demand is barely enough to keep the turbines turning.

Major consideration must be given to utilizing the off-peak power period for the production of ***SOLANOL***.

Using waste electricity
All waste electricity in industry can now be converted at any time of the day or night for the production of carbon-neutral ***SOLANOL.*** This process utilizes electrical power generated and normally lost via the burning of coal or natural gas, particularly where these power stations cannot easily be varied in electricity power output for the necessary base load power at different times of the day.

Energy from coal
Coal is primarily used as a solid fuel to produce electricity and heat through combustion. The energy density of coal can be expressed in kilowatt-hours, the units that electricity is most commonly sold in, per units of mass to estimate how much coal is required to power electrical appliances. One kilowatt-hour is 3.6MJ, and the energy density of coal is 6.67 kWh/kg. The typical thermodynamic efficiency of coal power plants is about 30%, so of the 6.67 kWh of energy per kilogram of coal, 30% of that – 2.0 kWh/kg – can successfully be turned into electricity; the rest is waste heat. *So coal power plants obtain approximately 2.0kWh per kilogram of burned coal.*

Improving efficiency
Over and above the off-peak generating losses in coal-fired power stations operating at 30% and natural gas fired power stations of 20% efficiency. This efficiency can be improved dramatically by utilizing the by-product of the hydroxy electrolysis process, Enviro-Oxygen.

It is estimated that the thermal efficiency of oxygen-enriched coal-fired power stations and natural gas power stations can be improved up to 60%, with only 40% losses. This increase in thermal efficiency can be utilized for the production of additional ***SOLANOL*** increasing the return on investment.

EGF uses a unique closed looped system for Natural Gas electrical turbines

Turbine input efficiency enhancer

The combustion of natural gas produces 50% less CO_2 emissions when these are utilized in the generation of electrical power.

The utilization of natural gas as an electrical power source for the production of ***SOLANOL*** is completely practical due to the necessity of cheap electricity and access to the exhausted flue gases from the natural gas turbine generators.

The introduction of the Enviro-Oxygen (O_2) as a by-product of Eco Global Fuel's hydroxy electrolysis process, in closed loop combustion of natural gas, produces all the necessary CO_2 output from the natural gas combustion turbine generating system. In other words, we have *developed an energy loop system– it feeds back energy into our system making it more efficient* This facilitates the necessary CO_2 to be catalytically converted into carbon monoxide (CO) for the total input requirements of the ethanol catalyst for the production of Solanol.

Therefore, the CO_2 flue gas emissions are totally converted by the catalyst to produce SOLANOL.

A ***SOLANOL*** carbon-neutral refinery has a benign non-polluting nature that will initially use normally vented CO_2, as the feedstock to create a carbon-neutral fuel matrix. The normally vented CO_2 from the Natural Gas turbine generating system is utilized to produce ***SOLANOL*** fuel in a closed looped system. When combusted via the emissions, the same absorbed CO_2 is released into the atmosphere and does not increase the CO_2 levels, and hence does not attract any 'carbon tax'.

This will greatly increase the energy produced in the form of electricity from a gas turbine generating system. It works at high efficiency due to the **higher temperatures** with minimal changes to the turbine configuration when burning **with O_2 input only**, for the total combustion of natural gas, which should increase the overall efficiency from 20% to 60%.

Additionally, natural gas cost per GJ has only doubled in the last 10 years, which is marginal when compared to petroleum products. Cost of Natural Gas increases by approx. US$0.2 per annum = US$2 in 10 years to US$4.50 per GJ currently.

Calculations using this system have produced our highest return on investment (ROI):

60 MW within 5 years – ROI 30–40%

EGF's unique solution to the pollution

We use pure oxy-fired coal/NG power producing transport fuels at the same time as also producing massive sequestering (via by-product pure oxygen and iron oxide)

Currently, national (international) coal and gas-fired power stations have an inherent environmental impediment – that 300 million tonnes of CO_2 is emitted into the atmosphere annually. The cost of removing this CO_2 component vented from the flue gases is a major technical-cost-deficit problem.

This will be overcome by introducing Eco Global Fuel's ***Enviro-Oxygen (O_2),*** which is a surplus by-product of the ***SOLANOL*** fuel process, to combust with coal or gas fired power stations instead of with air.

EGF produces pure O_2 as a by-product of our hydrogen production We inject pure O_2 into the coal turbines in contrast to the current process of using air, which contains impurities and high amounts of nitrogen. This produces polluting emissions and prevents them from sequestering.

We retro fit coal combustion for pure oxy-fired burn, which then makes a pure carbon black product which converts into stable carbon products:

- Olefins – plastics
- Formaldehyde, paints etc.
- Carbon black – e.g. car and truck tyres
- Carbon fertilizers
- Carbon graphite.

This keeps the carbon or CO_2 on the ground and not in the atmosphere. And it means *massive sequestering* for the fossil fuel industries. Initial calculations and a study on utilizing coal off peak electrical power have concluded a healthy return on investment for this process. At the same time, the process cleans up the coal power industry and produces a renewable transport fuel: ***SOLANOL.***

What is land based Algae production?

This is the process of distributing iron oxide into land-based chambers of algae, which encourages the growth of algae, which sequesters CO2 from the atmosphere. The good news is we have free iron oxide from our hydroxyl electrolysis process, for example: equivalent to the level necessary to sequester all the CO2 produced by a 60 MW turbine, as well as 100% more from the atmosphere, producing an overall 130 % sequestering from the whole approach. The algae are converted into Bio-Char, which keeps the carbon on the ground and increases dramatically agricultural yields. Our whole process has been overseen from experts who are totally in agreement that this is achievable.

Photovoltaic renewable DC energy input

- excellent government subsidies
- Return on investment from 13–17% as risk management
- Use of cheap arid land anywhere in the world
- Dramatically improved performance and efficiency
- Long lasting (25+ years)
- hugely reduced cost of manufacture

It is NOW feasible to convert the SUN's energy into a liquid matrix transportation fuel – ***SOLANOL.***

Solar power is experiencing a global explosion in use. Concerns over climate change and rising energy prices have driven billions of dollars into developing the efficiency and variety of technologies that capture energy from the sun. From new developments in photovoltaic panels to advances in materials, manufacturing processes and solar tracking, the entire production chain is being reconfigured.

Eco Global Fuels has access to the most inexpensive silicone-based solar panels on the market. Global photovoltaic manufacturing principals guarantee an operational life span of 25 years. Although photovoltaic-generated electricity is only available for approximately 11 hours per day, Eco Global Fuel overcomes this time constraint by storing the sun's energy in a carbon-neutral alcohol fuel matrix to be used as fuel at night and or any other time.

The current cost of buying photovoltaic cells is US$4 per Watt, but according to our projections these costs will be reduced to US$1 per Watt by 2015. Although the construction costs for a photovoltaic farm and a coal-based power station are not identical, the running costs of the former come out to be much less: $0.006 per kWh compared to US$0.03 per kWh. Why? Because the coal-based power station requires continual coal as fuel to run, when compared with photovoltaic farms which run on sunlight – a free and renewable fuel source.

EGF is A MAJOR Green House Emissions Reducer

The new era in environmentally sustainable energy production:

- Because we produce pure oxygen as a by-product of our hydrogen production from water- this oxygen is utilized for the production of a pure concentrated CO2 stream- and when combined with Hydrogen produces solanol fuels.
- We can utilized our by product iron to propagate the growth of algae to complete this sequestering of the atmospheric CO2
- We can produce pure carbon black products, from the CO2 given off at night via the growth of algae.
- All of which means MASSIVE GLOBAL SEQUESTERING

Which means for EGF investors:

- Cleans up the coal/gas/oil industries by the growth of algae and bio-char sequestering
- Reduces green house effects
- Creates massive carbon credits for EFG
- Means governments can meet their Kyoto agreements without disruptive inflationary effects on their economies
- Creates licensing fees and increased ROI for EGF investors

All of this from our by-product:

The cheapest pure oxygen and iron on the planet

CO2 extraction:

- Atmosphere; increased CO2 causes greenhouse effect
- Gas fields- massive emissions of relatively pure CO2
- 1000's of coal stations
- Over 370 in the USA
- Other polluting industries
- All needing to reduce CO2 producers
- Honest Governments have signed Kyoto agreements! This can create more honest governments, including the USA and Australia who have yet to sign.

EGF SEQUESTERING WITH LAND BASED ALGAE and BIO-CHAR PRODUCTION

Facts:

- The Eco Global Fuels Hydroxy generating process creates 1.12 grams of iron oxide grams per Kwh
- 0.01042 tonnes of iron oxide sequesters 7.3 tonnes of CO2 per hour
- Based on iron oxide as a food source for the propagation of algae growth
- Algae releases oxygen into the atmosphere during the day, and absorbs CO2 at night through photosynthesis

Using Gas Turbines- 60 MW

- 246 tonnes of iron oxide per year which creates:
- 304 tonnes of Algae per year
- Which sequesters 170,000 tonnes per year of CO2
- 125,000 tonnes of O2 is released into atmosphere per year
- The excess of sequestering we can do is based on:
- Total production is 589 tonnes per year of iron
- 589-246= 343 tonnes of iron oxide is now available for excess Sequestering of 240,000 of CO2 p.a
- **Total is 410,000 tonnes of CO2 sequestering per year.**

Using PhotoV – 60 MW

- We need 0.63 tonnes of iron oxide p.a
- This produces 0.25 tonnes of algae p.a
- This sequesters 448 tonnes of CO2
- 300,000 tonnes of O2 is released into atmosphere
- The excess of sequestering we can do is based on:
- 588 tonnes of iron oxide excess is available for the production of algae
- 300 tonnes of algae p.a which sequesters 400,000 tonnes of CO2 per year
- **Total 410,000 tonnes**

Using waste electricity – 60 MW

- We use 826 tonnes of iron oxide per year
- We produce 318 tonnes of algae
- This sequesters 580,000 tonnes of CO2 per year
- We need a total 826. We only make 589.
- 237 tonnes per year comes from another source.
- For example from one of the other solanol refineries that produces an excess such as photo voltaic
- The amount of algae per year is 1043 tonnes per year, based on 826 tonnes iron oxide
- **This sequesters 580,000 tonnes of CO2**

- 420,000 tonnes of oxygen is released into atmosphere per year

Please note: as CO2 levels have risen - O2 levels have fallen, also creating climate change

BIOCHAR

- Per tonne of Algae – we produce 700 kg of bio-char
- We also produce 300 kg of bio-oil
- This bio-oil is utilized as energy to pyrolysis – to produce bio-char.
- Bio-char is used in agriculture- it keeps the Carbon in and on the ground- and aids in fertilizing the land
- The aim is to produce bio-char and to stockpile the bio-char for future use. By continuingly producing bio-char, it will help to normalize CO2 levels
- 280 parts per million, which is the level Mother Nature determined before human activity
- Human activity has risen the CO2 levels to 390 parts per million, which effects climate (0.8 degrees above normal) globally
- Because of our unique by-production iron oxide production of algae- it produces OXYGEN during the day

This can be converted into stable carbon products such as:

- Olefin
- Carbon black car/truck tires
- Carbon fertilizers
- Carbon graphite

Keeps the CO2 on the ground and not in the atmosphere

MAY WE REMIND YOU …

28 Billion tonnes is a big number

It is the amount of sediment eroded each year from all mountains

And it is the amount of carbon dioxide (CO2) we pump into atmosphere each year, enough to cover Australia in a blanket two metres thick

Each year 28 Billion Tonnes of CO2 induces heating

Oceans now heating at a rate of 300 trillion watts

Equivalent to denoting 5 Hiroshima A-bombs every second

Every day of every year inducing the greenhouse effect

Energy use and needs are increasing exponentially

EGF mining and mineral ore separation

EGF offers a novel way to extract nickel, copper and chromium from refractory ore, which is currently not amenable to acid leaching processes.

EGF proposes a safe, environmentally sound, economical process for extracting the following metal ores (based on 2011 commodity prices):

- Copper (Cu_2O) – refractory copper ore US$9000 per tonne
- Nickel (NiO) – refractory nickel ore US$4000 per tonne
- Chromium (CrO) – refractory chromium ore US$6400 per tonne.

Different grades of mineral ores will consume between one to 10 tonnes of hydrogen per tonne of mineral ores. . It is estimated to produce a return on investment depending on ore type and energy input for the extraction of mineral ores by the use of EGF Hydrogen.

EGF ammonia production

Ammonia is normally produced by the catalytic reaction of nitrogen, and the cracking efficiency is about 75% with a profit of US$0.20 per kg.

N_2 + H_2 ammonia catalyst reaction plus Enviro-Oxygen

Efficiency @ 75% of 823g N_2 + 177g H_2 ammonia catalytic reactions:

Elements	%	MJ	kWh	H_2 gr
Hydrogen	13	33.75	9.375	177
Nitrogen	62			823
Heat losses	25	11.25	3.125	
Total	**100**	**45**	**12.5**	**1000**

In the catalytic reaction, the 823 grams of nitrogen plus 177 grams of hydrogen will produce 750 grams of ammonia per hour. Additionally, the hydroxy electrolysis system after membrane separation will produce 1416 grams of Enviro-Oxygen as a by-product. This by-product can easily be utilized, looped and combusted with the methane powered turbine to produce the necessary electrical power for the production of hydroxy gas. This will greatly improve the energy produced in the form of electricity from a gas turbine generating system at high efficiency due to the **higher temperatures** obtained when burning with O_2 input only for the total combustion of natural gas, which should increase the overall efficiency from 20% to 70%.

Market place applications

SOLANOL **REFINERIES**

- 60 MW applications (min. size to produce a remarkable ROI)
- 100 MW applications
- 400- 5000 MW applications
- The Bigger = better return on investment

DC INPUTS

- Waste Off-peak electricity
- Renewable photoV (solar / wind / geothermal / tidal) Natural gas turbines- looped with our pure oxygen
- Unique oxy-fired CO_2 looped gas turbines / coal power producing non emissions
- Emerging LENR technology (low energy nuclear reactions/cold fusion)

PRODUCING

- ***SOLANOL*** – ethanol and other fuel components
- H_2, O_2
- Cheap hydrogen forming the basis of manufacturing fertilizers / ammonia
- Mining application for ore separations: non-polluting production of nickel, copper, chromium
- Pure carbon black products
- Algae sequestering process up to 130 % with bio-char manufacturing

Market Place Value

Current 2012

- ***SOLANOL*** wholesale US$0.85 litre
- Production cost US$0.40 litre
- Margin US$0.45 litre
- Plus 2kg O_2 per litre ***SOLANOL*** @ US$0.30 per kg

Total wholesale

- ***SOLANOL*** + O_2 = 0.85 + 0.60 = US$1.45 turnover
- Minus production cost US$0.40 = US$1.05 profit per litre of ***SOLANOL*** ethanol components and O_2 (without government subsidies)

Hydrogen + Oxygen production H_2 + O_2 per kg of hydrogen

- H_2 = 1kg
- O_2 = 8kg
- We require 9kg water (H_20)
- We need 70kWh to produce 1kg of pure hydrogen
- We also produce 8kg of pure O_2
- Enviro-Hydrogen value is US$6 per kg
- Enviro-Oxygen value is US$0.30 per kg

ROI have been calculated for:
60-100-1000 MW using photoV, natural gas, off-peak waste electricity. Following pages based on 60 MW electricity inputs

Calculations and projections are based on 162 litres H_2 plus 81 litres O_2 flow rate per kWh (independent validation trials). In-house trials have produced 195 litres H_2 plus 97.5 litres O_2 flow rate per kWh. This means all calculations and projections can be modestly increased by 195/162 = 1.2 = 20 % increase on ROI.

Calculations do not include any performance increases from our IP unique ***SOLANOL*** catalytic reactions, and licensing fees from Co2 sequestering

Marketplace cost / profit and ROI summary

Solanol wholesale $0.90 litre
Production cost range $0.25 -0.35 litre

Depending on DC input production costs
Calculations based on 60 MW electrical inputs are:

Gas turbines (0.25 cents per L)
Waste electricity (0.30 cents per L)
Solar (0.35 cents per L)

Profit Margins (wholesale-production cost)

Gas turbines $0.65 cents per L
Waste elec. $0.60 cents per L
Solar $0.55 cents per L

Gross Profit margins based on 60 MW per year

- Gas turbines produce 35 Million litres per year x 0.65 **= 23 Million**
- Waste elec. produces 26.4 Million litres x 0.60 **= 16 Million**
- Solar produces 22 million litres x 0.55 **= 12 Million**

Revenue summary

- Sale of Ethanol and Solanol fuel products
- Sale of Hydrogen
- Sale of pure Oxygen
- Production of electricity / 24 hr base load production
- Licensing fees from gas/coal/oil industries reducing CO2
- Manufacturing Carbon black products
- Carbon footprint credits due to massive sequestering
- Mining and Mineral ore separations
- Bio-Char sales
- Agricultural regeneration projects
- Turning the sun's energy into base load and transport fuels

SOCIAL ECONOMICAL PLANETARY BENEFITS

- High public and government support
- Reduces dependence on imported oil
- Reduces greenhouse emissions
- Makes western economics more stable
- Reduces inflation, energy costs
- Kyoto agreements can be honestly meet
- Putting nature's balance back on track

60 MW

Using Solar Panels

producing SOLANOL

hydrogen 6000 tonnes

oxygen 48,000 tonnes

Solanol production based on 15.86 kg per hour of hydrogen = 64.38 litres per hour of solanol

value = $55 = (55 divided by 64.38= 0.85 per litre)

563,969 litres per year x 0.85 = $ 480,000 per year (scale 1) x 39= 18.8 M

18.8 M – 1.2 M (the cost of natural gas to produce the pure CO2 for solanol)= **17.6 M (turnover)**

1536 kWh = 64.38 litres per hour of solanol derived from 100 kg CO2

60,000 kWh divided by 1536 = 39 x larger

Volume of solanol per year = 22 M litres = value per current year 480,000 x 39= 18.8 M (-1.2 Nat Gas) = 17.6 M

Solanol increases from $55 to $80 to $100 to $120 to $150

Current turnover 17.6 M

Construction costs: current 455 M , 407 (2yr) 360 (3yr) 312 (4yr) 256 (5yr)

Operational + maintenance costs 6 M

current ROI:	17.6 SOL - 6 = 11.6 x 100 div 455	= 3 %
2 year Projection ROI :	26.1 M SOL - 6 = 20.1 x 100 div 407	= 5 %
3 year ROI:	33 M SOL - 6 = 27 x 100 div 360	= 8 %
4 year ROI:	39.9 M SOL - 6 = 33.9 x 100 div 312	= 11%
5 year ROI:	50 M SOL - 6 = 44 x 100 div 265	= 17%

60 MW

Using Natural Gas Turbines

Producing Solanol

Producing hydrogen 9500 tonnes for solanol production and oxygen 77,000 tonnes

Solanol production based on 15.86 kg per hour of hydrogen = 64.38 litres per hour of solanol

value = $55 = (55 divided by 64.38= 0.85 per litre)

563,969 litres per year x 0.85 = $ 480,000 per year (scale 1) x 62.5= 30 M

969 kWh = 64.38 litres per hour of solanol derived from 100 kg CO2

60,000 kWh divided by 969 = 62.5 x larger

Volume of solanol per year = 35 M litres = value per current year 480,,000 x 62.5= 35 M

Solanol increases from $55 to $80 to $100 to $120 to $150 : Current + projected turnover 35 M) (43.8) (54.8) 65.7)

Cost of natural gas:38.3 MJ = 717gr = M3, Cost of per GJ/ NG = US$3.8, Cost of per 3.6MJ or kWh/ NG = US$0.0138

Purchase retail cost of NG turbine generated electricity per kWh = US$0.04

Current + projected NG costs: 21 M, 22.1 (2 yr), 23.1 (3yr), 24.2 (4yr), 25.2 (5yr)

Construction costs: Current + projected turbines + hydroxy +ranknine +cryogenics+ Catayst + storage etc :

NG turbine elec power generation (60 M) +hydroxy sys (35 M)+Rankine cycle (16 M)+ cryogen (18 M) + catayst (10M) + storage/pipeline (4 M) and contingencies (6 M)

149 M, 150 M (2yr), 151 (3yr), 152 (4yr), 153 (5yr) and Operational costs 6 M

Current ROI : 30.1 - 21.0 – 6 = 3.1 x 100 div 149 = 2%

2 year: 43.8 - 22.1 - 6 = 15.7 x 100 div 150 = 11%

3 year: 54.8 - 23.1 -6 = 31.7 x 100 div 151 = 21 %

4 year: 65.7 - 24.2 - 6 = 35.5 x 100 div 152 = 24 %

5 year: 82.1 - 25.2 - 6 = 51 x 100 div 153 = 35 %

60 MW

Using Off Peak Waste Electriciy from Coal Power Stations

Producing Solanol

@ 0.0675 cents kWh (with and without tariff ROI)

Producing hydrogen 6500 tonnes for solanol production and oxygen 52,000 tonnes

Solanol production based on 15.86 kg per hour of hydrogen = 64.38 litres per hour of solanol

Value = $55 = (55 divided by 64.38= 0.85 per litre)

563,969 litres per year x 0.85 = $ 480,000 per year (scale 1) x 46.7 = 22.4 M

1287 kWh = 64.38 litres per hour of solanol derived from 100 kg CO2

60,000 kWh divided by 1287 = 46.7 x larger

Volume of solanol per year = 26.4 M litres = value per current year 480,,000 x 46.7= 22.4 M

Solanol increases from $55 to $80 to $100 to $120 to $150 : projected turnover (22.4 M) (32.7) (40.9) (49) (61.4)

Projected costs of electricity: 35.5 M current , 37 (2yr), 38.2 (3yr), 39.9 (4yr), 41.4 M (5yr)

Construction costs: Hydroxy sys (35 M)+Rankine cycle (15 M)+ cryogen (16 M) + CO2 Furnace (10M) + Catalyst (10M)+ storage/pipeline (4 M) and contingencies (6 M) =

Total = 96 M

Projected 97, 98, 99, 100

Operational costs 6 M

ROI:

Current ROI 22.4 - 35.5 – 6 = -19.1 x 100 div 96 = with tariff (- 20 %) and without: **18 %**

2 year: 32.7 - 37 - 6 = -10.3 x 100 div 97= with tariff (-11%) without tariff: **28 %**

3 year: 40.9 – 38.2 - 6 = - 3.3 x 100 div 98 = with tariff (-4 %) without tariff: **37 %**

4 year: 49 – 39.9 – 6 = + 3.1 x 100 div 99 = with tariff (+3%) without tariff: **45 %**

5 year: 61.4 – 41.4 – 6 = 14 x 100 div 100 = with tariff (15 %) without tariff **57%**

Investment Strategy

Private Placement of Stock

- A prototype to be built in Sydney Australia
- Template for all other refineries
- Safety, maintenance, workplace practices established
- Engineering protocols, computer programming controls
- Operating manuals written and approved by government
- **We become internationally recognized as a major solution to the world's energy needs**

Safety testing prototype

- Construct 1 Hydroxy Generator
- Upgrade the cells to 3 mm electrodes
- Upgrade of cooling system to maintain 70 C
- Test trials at 80 amps to increase the Hydroxy flow rate efficiency per kWh
- Test trials for safety (with Test Safe Australia –a division of Work Cover)
- Recalculating cell degradation and production of iron by-product based on 80 amps
- Trial will run for 3 months and continuous 24 hrs
- Test procedures will include induced detonations to prove up the complete safety
- Time frame over 6-12 months. Budget details available
- Budget $A 654,000

Production Refinery Prototype

- 300 kWh- minimum size necessary to run our catalyst chamber
- We use mains power to reduce set-up costs
- If using photoV 2 acre solar farm (8 hectares, 8000 m2)
- Use cheap industrial land/ lease
- 200 hydroxy generators manufactured
- Cryogenics and catalysis chambers constructed
- 12 months construction
- Physical demonstration of ethanol production
- Government R+D tax concessions available
- Business development
- Time frame 1-2 years, Construction and budget details available
- Budget $12.6 M

Total investment A$15 M

Equity Stock release

This is a Template for construction of all SOLANOL refineries worldwide and a working final proof of concept that can be witnessed by all governments and industries. ***EGF enters into JV's and licensing agreements globally, producing a ROI for our investors.***

Key features

Eco Global Fuels

A pioneer in clean renewable energy and CO2 sequestering

- A unique independently validated technology to produce the cheapest hydrogen. It is efficient and cost effective, uses cheap readily available materials and is economically feasible to scale up to any size
- A method of extracting CO_2 from CO_2 emitting industries, combining it with hydrogen to produce Ethanol, which at the same time reduces CO_2 emissions and increasing ROI.
- A by-product 'O_2', can be looped directly back into a coal burning power station. Rather than using AIR, which contains NITROGEN (N_2), we feed the flue system with 100% PURE O_2 to produce CLEAN CO_2 emissions that can be directly converted to carbon black products, (without toxic residuals), such as tires and other products.
- A method of utilizing our by product iron oxide into the most efficient sequestering method known referred to as land algae production / bio-char production
- A method of producing a variety of energy efficient fuels such as ethanol, butanol and aviation fuels.
- ***SOLANOL*** fuels provides identical mileage to gasoline and aviation fuel and has a higher-octane level than many other biofuels such as methanol
- Eco Global Fuel plants can be located near existing coal or oil powered plants stations, and/or on very cheap land
- Produces fuel at market-competitive prices with excellent ROI
- Reduces dependency on oil and coal
- We are a 24 hour base load industry
- ***SOLANOL*** is distributed using existing delivery infrastructure
- All financial returns are above average ROI
- Unique IP
- Ultra reliable
- Low cost to manufacture
- Cheapest hydrogen in the world
- Durable, robust, safe
- 25 year life span!
- External separation (competition has unreliable internal separation)
- No exotic expensive materials (as with competition)
- Low maintenance – no obstruction (as with competition)
- Scalable, economically achievable (unlike competition)
- FLOW RATE PROVEN and Independently tested
- 162 litres/kW hour H_2 production

The Eco Global Fuels model for energy fuel production is more cost-effective than our competitors, yielding a higher ROI without subsidies and without having any effect on food prices. Also for every *1*kg/lb of H_2 produced, *8*kg/lb of O_2 is also produced

Anywhere, where CO_2 is emitted, we can build a facility which coverts greenhouse emissions into ethanol, a win-win for all.

THE TEAM

Ross Spiros
Australian, inventor
Owner and Director: R & D Company

Roger Green
Eco Global Fuels Principal Investor.
Owner: Exclusive Global license IP
CEO: Eco Global Fuels PTY LTD (Australia)
CEO: Eco Global Fuels USA LLC (USA)
Offices in New York City and Sydney Australia

Eco Global Fuels
A company registered in Sydney Australia
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Eco Global Fuels has offices in Sydney and New York City
Banking with the Commonwealth Bank of Australia
Banking with HSBC- US

Eco Global Fuels

The Power to Create Renewable Carbon Neutral Carbon-neutral Transport Fuels

Sustainable SOLANOL Ethanol

In the future, the production of transportation fuels will be sustainable, affordable and ecologically sound. Thanks to Eco Global Fuels, the future is now.

SOLANOL is our registered Trade Name for any transport fuel produced with our unique technology

www.EcoGlobalFuels.com