What is ocean fertilization?

This is the process of distributing iron oxide into the ocean, 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, equivalent to the level necessary to sequester all the CO2 produced by a 60 MW turbine. We produce the necessary iron oxide as a by-produce of the hydroxy electrolysis process, required for iron fertilization of the ocean, to sequester all carbon dioxide emissions.

Ref:

0.5 Tonne Iron oxide 100 km^2 ocean 350 Tonne CO_2 absorbed

OCEAN FERTILIZATION as an Environmental Solution

Conclusion: as you read through our proof, you will realize that EGF is the only method that can deliver renewable fuels and at the same time dramatically create massive sequestering of CO2 using ocean fertilization due to its ability to produce the required IORN OXIDE for this process

The horrific global production of carbon dioxide can only be neutralized by iron fertilization as a necessary futuristic remedy to the sequestration of carbon dioxide

Iron fertilization of the oceans is a proven concept and if utilised can sequester carbon dioxide from the atmosphere.

Below are different examples researched and these examples will be summarized and our examples will be calculated on the items under consideration below:

1. Tonnages of iron oxide necessary.
2. Tonnages of algae produced.
3. Square kilometers of ocean necessary.
4. Tonnages of carbon dioxide absorbed and sequested.
5. Tonnages of oxygen produced via the photosynthesis process – this is an important aspect

6. Tonnages of sodium hydroxide also released into the oceans improving the pH in the oceans.
7. Also increases the volume of marine life (increase in fish stocks globally) due to the increase of algae being top of the food chain.

<u>The current Eco Global Fuels tests- University validation is based on efficiencies derived utilizing lower amps</u>

{I.17kW/h or 4.2 MJ} + {H_2O130.31 grams}
= {H_2 12.87 grams, 138 Lph}.
+ {O_2 102.32 grams,69 Lph}.
+ {2.5MJ Loss}.

34.2 Amps x 18 Volts
= 0.616 kWh

426.6 gr steel was converted to iron oxide
= 426.6 gr iron oxide

426.6 gr oxide
= 787 hours

The calculations below are based on efficiencies derived utilizing projected higher amps efficiencies are as follows:

{I.17kW/h or 4.2 MJ} + {H_2O153 grams}
= {H_2 17 grams, 190 Lph}.
+ {O_2 136 grams, 95.5Lph}.
+ {1.75MJ Loss}.

The new upgraded hydroxy cell configuration for the creation of iron oxide a by-product of the hydroxy electrolysis process configuration of 12 cells equates to 20% more iron oxide produced described below:

85 Amps x 21.6 Volts
= 1.84 kWh per hydroxy tube

<u>85 Amps</u>
34.2 Amps
= 2.5 Times more

2.5 x 426.6 gr iron oxide x 20%
= 1,272 gr iron oxide per hour

<u>1,272 gr iron oxide</u>
787hours
= 1.6 gr iron oxide per hour

US$0.52 per kilogram of Steel
1.6 gr iron oxide kWh
= US$0.0008 kWh

US$0.0008 kWh x 60,000 kWh
= US$48 kWh

1.6 gr iron oxide per hour x 60,000 kW x 24 x 365 per annum = 840 Tonne

840 Tonne iron oxide x commodity price AU$200 per annum = AU$168,000

http://www-formal.stanford.edu/jmc/progress/iron.txt

By spreading and/or utilising the global circulating currents, just half a tonne of iron oxide across 100 square kilometres of ocean, the oceanographers had stimulated enough plant growth to soak up some 350,000 kilograms of carbon dioxide from the seawater. If performed on a grand scale, iron fertilization of ocean water could absorb billions of tonnes of carbon dioxide from the air, enough to slow the rate of greenhouse warming, according to some rough estimates.

0.5 Tonne Iron oxide 100 km^2 ocean 350 Tonne CO_2 absorbed

Iron fertilization - Wikipedia, the free encyclopedia:

The potential of iron fertilization as a geoengineering technique to tackle global warming is illustrated by the following figures. If phytoplankton converted all the nitrate and phosphate present in the surface mixed layer across the entire Antarctic circumpolar current into organic carbon, the resulting carbon dioxide deficit could be compensated by uptake from the atmosphere amounting to about 0.8 to 1.4 gigatonnes of carbon per year. This quantity is comparable in magnitude to annual anthropogenic fossil fuels combustion of approximately 6 gigatonnes. It should be noted that the Antarctic circumpolar current region is only one of several in which iron fertilization could be conducted—the Galapagos islands area being another potentially suitable location (it can be done anywhere) Estimated averages calculated for the iron fertilization of the oceans in two days:

0.5 Tonne Iron oxide 100 km^2 ocean 350 Tonne CO_2 absorbed in 48 hours

0.5 Tonne Iron oxide 100 km^2 ocean 7.3 Tonne CO_2 absorbed in 1 hour

1.1 kg CO_2 per 0.83kg coal per 1kWh requires 1kg O_2 for per hour for total combustion:

66 Tonne CO_2 per 50 Tonne coal per 60 MWh 60 Tonne O_2 for per hour for total combustion:

Therefore, the calculations below reflect the necessary criteria for the growth of algae over two days as described in the link below:

"Lifespans differ for each species of algae, with an average life expectancy ranging from a few days to a year or two.

"**Life Cycle of Algae | eHow.com**

http://www.ehow.com/about_5347723_life-cycle-algae.html

4.5 Tonne Iron oxide 900 km^2 ocean 66 Tonne CO_2 absorbed in 1hour

1.6 gr iron oxide per 1kWh x 60,000kWh x 48 hours
= 4.6 Tonne Iron oxide

US$0.0008 kWh x 60,000 kWh
= US$48 per hour @ no cost

Iron Ore - Monthly Price - Commodity Prices - Price Charts, Data, and News - IndexMundi

http://www.indexmundi.com/commodities/?commodity=iron-ore&months=60

According to the search above the cost of iron ore-iron- oxide is currently US$150.00 per tonne, and with additional cost of distributed, which means iron fertilization of the ocean is an expensive exercise, which would depend on pay back from carbon credits, if considered commercially.

Therefore, the obvious supply of the necessary iron oxide can easily be produced via the denigration of the steel electrodes during the hydroxy electrolysis process as a byproduct at no cost. This iron oxide can be utilised for iron fertilization for the production of algae to sequest all the carbon dioxide produced by fossil fuel combustion.

4.5 Tonne Iron oxide 900 km^2 ocean 66 Tonne CO_2 absorbed in 1hour

4.5 Tonne Iron oxide 900 km^2 ocean 3,168 Tonne CO_2 absorbed in 48 hours

4.5 Tonne Iron oxide 900 km^2 ocean 0.58 million Tonne CO_2 absorbed in 1 year

60MW@ 0.58 million Tonne CO_2 absorbed x US$8.00 = US$4.7 carbon credits per annum

The area of the World Oceans is 361 million square kilometres (139 million square miles).

Obviously, utilization of the world's oceans in their entirety would not be possible. It is envisaged that only one tenth of the oceans can be utilised for the international iron fertilization programme.

361 million km^2 ocean

900 km^2 ocean x 10 = 40,111 times

60MW x 40,111 = 2,406,666 MW

40,111 x 0.58 million Tonne CO_2 absorbed = 23 billion Tonne CO_2 absorbed annum

Ocean - Wikipedia, the free encyclopedia

840 Tonne iron oxide x commodity price US$200
= US$168,000 per annum

Current ATM CO_2 18 billion Tonne CO_2 absorbed
x US$8.00
= US$144 billion carbon credits annum

Emissions of CO2 by human activities are currently more than 130 times greater than the quantity emitted by volcanoes, amounting to about 27 billion tonnes per year.

The above 23 billion tonnes of CO_2 sequestered utilizing 10% of the world's oceans caters for only the flue gases exhausted from coal-fired power stations. The amount of CO_2 produced by the burning of fossil fuels equates to a staggering 27 billion tonnes per year. Obviously, a further 5% of the world's oceans must be also subjected to iron fertilisation to sequest the balance and any increase of CO_2 emissions due to human activity.

Carbon dioxide - Wikipedia, the free encyclopedia

As can be concluded with the ROI utilizing the iron oxide for the production of algae to sequest carbon dioxide and earning carbon credits

is a much more lucrative ROI compared with the sale of the iron oxide for the production of steel.

Carbon credit - Wikipedia, the free encyclopedia

The 2009 average is 387.35 ppm. For the past decade (2001-2010) the average annual increase is 2.04 ppm per year. Annual data for 2010 was posted September 8, 2011, by the National Oceanic and Atmospheric Administration in the US.

Global warming - Wikipedia, the free encyclopedia

Earth's average surface temperature increased by about 0.8 °C (1.4 °F) with about two thirds of the increase occurring over just the last three decades.

The increase of concentration from pre-industrial concentrations of 280 ppm has again doubled in just the last 33 years.

Carbon dioxide in Earth's atmosphere - Wikipedia, the free encyclopedia

In just the last 33 years:

CO_2 387.35 ppm — CO_2 280 ppm = CO_2 107.35 ppm increase = 0.8 °C increase global temperature.

Therefore:

$$\frac{\text{0.8 °C increase global temperature}}{CO_2 \text{ 107.35 ppm increase}} = \text{0.0075 °C increase per 1ppm.}$$

CO2 Now | CO2 Home

SAN FRANCISCO—A mantra that has driven global negotiations on carbon dioxide emissions for years has been that policy-makers must prevent warming of more than two degrees Celsius to prevent apocalyptic climate outcomes. And, two degrees has been a point of no return, a limit directly or indirectly agreed to by negotiators at international climate talks. James Hansen, director of the NASA Goddard Institute for Space Studies in New York, whose data since the 1980s has been central to setting that benchmark, said today that two degrees is too much.

2 °C — 0.8 °C increase global temperature
= 1.2 °C

1.2 °C

0.0075 °C
= CO_2 160 ppm increase

Current CO_2 387.35 ppm + CO_2 160 ppm increase
= CO_2 547.35 ppm point of no return

2-Degree Global Warming Limit Is Called a "Prescription for Disaster" | Observations, Scientific American Blog Network

China's exceedingly high energy demand has pushed the demand for relatively cheap coal-fired power. Each week, another 2GW of coal-fired power is put online. While there are other sources of power generation available, China's ready access to domestic coal reserves means it is significantly cheaper to extract and transport than other fuel.

The amount of megawatts creating 18 billion Tonne per year of carbon dioxide by coal-fired power stations equates to 1.9 Million MW. Ten percent of the world's oceans can sequester carbon dioxide produced by 2.4 Million MW in totality.

After subtracting 1.9 Million MW electrical power produced from existing coal-fired power stations, equates to 0.5 Million MW remaining only utilizing 10% of the world's oceans.

The totality of coal-fired power stations in use in the world today equates to a staggering 510 with China constructed an incredible one coal-fired power station per week with an average size of 2,000MW.

2.4 Million MW
2,000MW

= 1,200 coal-fired power stations utilizing 10% World's Oceans.

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www.EcoGlobalFuels.com