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Promotion of CO_2 assimilation by Stopping of NOx, NP elimination are easy method to stop global warming and to growth

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Abstract

Global warming is caused by the retardation of CO_2 assimilation by the elimination of NOx and NP in seven developed countries. Global warming can be protected, if enough amounts of nutrients containing nitrogen and phosphorous are supplied. Most easily available substances containing nitrogen and phosphorous are NOx and NP in waste water. But developed contrails are eliminating NOx by put in ammonia in the exit gas. and eliminating nitrogen and phosphorus in waste water by activated sludge process. CO_2 assimilation is retarded and plankton and plant growth are retarded. If developed countries stop the addition of ammonia to the exit gas and close waste water clean center, CO_2 assimilation is activated and CO_2 does not increase and global warming will stop. In addition, production of grain and fish will increase and GDP, national wealth and population will increase. The goal "CO_2 increase zero and growth" described in Paris Agreement could be accomplished sooner than 2050. Promotion of CO_2 assimilation is essential for protection of global warming and for growth.

Keywords: CO_2 assimilation; NOx; Ammonia; NOx elimination by ammonia; Carbon neutral; GWPR

1. Introduction

Concentration of CO_2 at billion years ago when earth was born was 90%. Present CO_2 concentration is 0.04 %. Plankton CO_2 assimilation and tree CO_2 assimilation reduced CO_2 concentration.The reaction of CO_2 with water produce carbohydrate and oxygen. Fossil of plankton is oil. Fossil of tree is coal.

$$6\ CO_2 + 6\ H_2O + 6 \times 114\ Kcal \longrightarrow C_6H_{12}O_6 + 6\ O_2$$

Biology contain 1/25 nitrogen of carbon, and 1/125 phosphorous of carbon. Therefore one carbon , 1/25 nitrogen of carbon, and 1/125 phosphorous of carbon is necessary for CO_2 assimilation to produce biology.

2. Method to get carbon neutral

Paris agreement asking us: CO_2 emission is equal as carbon fix and progress by 2050. Author define ratio CO_2 em and CO_2 fix as GWPR (Global Warming Protection Ratio)

$$GWPR = CO_2\ em / CO_2\ fix$$

Carbon neutral is CO_2 em = CO_2 fix and GWPR = 1 Present GWPR of the world is 1.3. To lower 1.3 to 1, we can do by lower numerator CO_2 em or increase denominator CO_2 fix.

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Global warming is in progress. CO_2 concentration is increasing 20 ppm every year.CO_2 emission of the world increased from 100 hundred million tone in 1960,170 hmt in 1975, 200 hmt ln 1985, 360 hmt in 2018.

When I looked for the reason, I found that environmental measures at developed countries are major reasons. Development countries are eliminating nitrogen and phosphorous and CO_2 assimilation is blocked and CO_2 fix is reduced . CO_2 is increasing. Agriculture and fish industry are blocked. GDP of these countries do not increase much. Stop elimination of NP will activate CO_2 assimilation and increase fish, grain production and increase GDP and protect global warming. (Ref 1-58).

2.1. NOx is best compound to promote CO_2 assimilation(ref 7,58)

W. Nordhaus (Winner of Nobel Economic Science 2018) proposed theory that global warming is due to increase of CO_2 . Carbon emission reduction, decarboxylation are necessary (ref 59-62). Increase of CO_2 is reason of global warming and decrease of CO_2 emission can protect global warming. Developed countries are also considering that decrease of CO_2 emission can protect global warming. But CO_2 is main raw material for CO_2 assimilation. Increase of CO_2 increase the speed of CO_2 assimilation. Many reports say that increase of CO_2 is favorable for increase of green area and regulation of climate and protection of global warming(ref 63-82)

When red tide happened at near fishery plant at Kagawa prefecture. Japan government build 2200 clean center at all over Japan, eliminating nitrogen 3318 tone and 318 tone phosphorous This center use about one thirds of electricity produced by solar electricity. And Japan rebuild new high temperature incinerator to eliminate NOx. We should stop the supply of electricity to close clean center. Then concentration of nitrogen and phosphor increase and fish production will increase and consumption of electricity will stop.

NOx of exit gas of car is hated as toxic substance For electrify generation plant, seven developed country asked ammonia to eliminate NOx

$$4\,NO + 4NH_3 + O_2 \text{————-> } 4\,N_2 + 6\,H_2O$$

CO_2 produced at developed countries is around 10 billion tone. And around 10x 1/25 = 4 hundred million tone NOx is produced. To eliminate this NO (90% of NOx is NO), 226 million tone ammonia NH3 is used. Amount of NOx is so much . Elimination of NOx use much ammonia and natural gas . These decision give greatest damage for agriculture and fish industry , GDP and protection of global warming.

NOx îs eliminated by ammonia. Ammonia is produced by the reaction of nitrogen an hydrogen. Hydrogen is produced by the reaction of methane with water.

$$4\,NO\,(120) + 4NH_3\,(68) + O_2 \text{————-> } 4\,N_2 + 6\,H_2O$$

400 mill t 226.7 mill t
To make 226.2 mills NH_3, 400 mill t H_2 is used.

$$3H_2\,(6) + N_2 \text{————-> } 2NH_3\,(34)$$
400 mill t 226.2 mill t

To make 400 mill tone H_2, 80000 mill t CH_4 is used. And 220 mill t CO_2 is produced.

$$CH_4\,(16) + 2\,H_2O \text{————> } 4\,H_2(8) + CO_2\,(44)$$

8000 mill t 400 mill t 220 mill t

Government of developed country asked the addition of ammonia to the exit gas of factory by the ratio of 400 mill tone NOx to 226.7 mill tone ammonia If factory do not follow this rule, they cannot operate the factory Amount of NOx and ammonia is huge . Japan is keeping this arrangement most honestly. Then NOx concentration in exit gas of Japan is lowest 0.1 g/kWh ,USA is 0.5 g/kWh ,Germany 0.31 g/kWh and China,India, Indonesia (no NOx elimination country) are 1.6 g/kWh.. GDP ratio 2021/1991 USA is 3.2, Japan 1.1, Germany 4.3, Developed countries use much fossil to eliminate NOx The price of electricity is high and productive industry moved to Developing countrie These countries increased GDP. 2021/1991 China 51.1,India 11.1. No NOx elimination country use NOx as fertilizer and getting much food and fixing all CO_2 produced at his country. GWPR of developed countries is over 1. Japan is 3.3. and criticized as carbon

country. The price of electricity differ greatly by doing NOx elimination or not. Developing country like China 1.4-4.3 c/kWh, India, 6 c /kWh,Indonesia 10 c/ kWh. Developed countries who eliminate NOx USA 10 c/kWh, Japan 24 c/kWh,Germany 33 c/kWh,UK 15.4 c/lWh,Italy 28 c/kWh.

If developed country stop the addition of ammonia to the exit gas, Consumption of 8000 million tone CH4 can be saved. And emission of 220 million tone CO_2 can be saved. And 400 mill t x 25 = 10 billion t CO_2 can be fixed. Accordingly 220 mill t + 10 bill t = 10.22 billion tone CO_2 can be fixed. CO_2 em addition of developed countries is 10 billion tone.GWPR (CO_2 em)/ (CO_2 fix) = 1.

Therefore, CO_2 increase is zero. 10.22 billion Tone CO_2 produce plant like wheat. CO_2 produce plant 2/3 30(1/6 of molecular weight of C6 H20 O6) /44 Molecular weight ofCO_2)) weight of his weight. Wheat contain 2/3 straw of his weight Wheat grain will be about 1/3 weight of plant. 10.22 billion Tone CO_2 can afford

10.22 billion x 30/44 x1/3 = 2.32 billion tone grain. 1kg wheat is 1.5 $ 2.32 billion kg wheat is 3.48billion $. Therefore, if developed country do not eliminate NP. 2.32 billion Tone wheat. 3.48 billion$ is produced. GDP will increase. Economy of developed country will become much better. And global warming will not happen

2.2. Increase of the concentration of phosphorous is very important(ref 45,46)

At around 1970, phosphorous and nitrogen is said as environment divil and eliminated. The elimination of pho112sphorous and nitrogen induced global warming.

Isoyake and desertifications happened. Aomori at Iwamatsu river Ehime Japan decreased. Ayu production at Yoshino river Tokushima Japan . No sea weed and production of fish like Kawahagi decreased remarkably .

Phosphorous is essential element for plant and animals. Nucleic acid a polymers combined hydroxy group of sugars and phosphoric acid., Adenosine triphosphate , inositol(1,4,5)- triphosphate(IP3) Ca, mobilizing second messenger, phosphatidy inositol (PIP2) Plant like rice, wheat and and corn make seed.

Seed contain much phosphorous compounds like phytic acid , inositol hexaphosphate. Seed has self-preservation instinct to stock phosphorous to alive even garmented at no phosphorous land by keeping phosphorous to make nucleic acid. Plant need much phosphorus at harvest time to make phytic acid.

2.3. Supplies of phosphorous are carried out by three ways(ref 1)

- Sodium tripoly phosphate.60 thousand tone /year is used as detergent additives at around 1970-85 in Japan. When this reagent is used, nori production increased Nori production center was west part of Seto inland sea. Ohita and Ehime prefecture.But since use of Sodium tripoly phosphate started, production center of nori moved to east part of Seto inland sea, Hyougo,Kagawa, Okayama Prefecture. Production amount of nori increased. Nori is also produced much Nori produced at Hichirgahamai at Kamakura I have never see Nori production at Hichirigahama before. Fish production increased. I can fish Sardin at Takahama Haber at Matsuyama Japan just in front o of my house. The sale of sodium triply phosphate is inhibited now. And zeolite is used as detergent additives. But the use of sodium tripolyphosphate is recommended .Then the production of fish, shijimi and nori.will increase.
- Phosphorous in waste water. Waste water contain much phosphorous. Phosphorous elimination at clean center induced global warming Fish production reduced at Seto inland sea from 0.5 million ton 1980 to 0.05 million tone in 1995(ref 83, 84) and Ayu and honmoroko production at Biwa Lake Shiga Japan decreased from 3000 tone in 1985 to 220 tone in 2015 because total phosphorous load decreased from 460 t/Y in 1985 to 220 t/Y in 2015(ref85)

NOx in exit gas of all plant was eliminated by ammonia. Then nitrogen concentration of sea decreased from 1980 0.40 mg/L to 2015 0.05 mg/ L. Total phosphorous decreased from 1980 0.04 mg/L to 2015 0.005 mg/L. Sea weed do not grow. Plankton do not grow, Nori growing plant stopped. Fish production of Japan decreased from 1980 12 million tone to 2018 4 million tone (ref 58).These manures are sent to clean center and treated by activated sludge process. This kind of treatment reduce the concentration of phosphorous and nitrogen. The process consume one third of electricity produced by solar electricity. Therefore operation of clean center should stop. Then concentration of phosphorous and nitrogen will recover. Product of fish and grain will recover and GWPR will recover from 3.3 to 1.3 and DGP increase rate will recover. Because the supply of electricity consumed much fossil. The supply of phosphor become difficult. Price of fertilizer increased. 14-14-14 chemical fertilizer 20 kg was 2019 20$ now 2023 60$.

Phosphorous and nitrogen eliminations of the world will be 10 times of Japan. If developed countries stop the elimination of nitrogen and phosphorous by stopping of waste water purification center , 82950 tone fish will be produced. And 121660 tone CO_2 will be fixed.

Nitrogen 3318x 10 = 33180 tone

Phosphorous 318 x 10 = 3180 tone.

Then 33180 x 25 = 82950 tone fish

82950 x 44/ 30. = 121660 tone CO_2

Kishida Prime minister of Japan suggested the use of active sludge as fertilizer. Stopping of electricity supply to clean center is easy method to increase phosphorous and nitrogen concentration.

- Main phosphorus provider is sea water. (Ref 1).Sea water contain 88μg/l in average. Plant ,plankton and sea weed use this phosphorous. Concentration of phosphorous at surface of sea is low. And deep of sea, concentration is high. Kuroshio running south of Japan contain few nutrient and plankton is not much and number of fish is small. Oyashiro running north part of Japan contain much nutrient and plankton is much and fish is much. Surface of sea at 100 km south of Muroto concentration of nitrogen is 1 μg/l , phosphor 0.3 μg /l.

At the same spot 100 m deep sea water concentration of nitrogen is 33μg/l 30 times of surface and phosphorous is 2.9μg/l 10 times of surface. Kuroshio is deep and surface is warm(26 degree C) and bottom is cool (3.9 degree C) and convection is not possible.

Oyashio running north part of Japan surface is cool and bottom is warm and wind is strong. Then conviction is happening and nutrient nitrogen and phosphorous is shifted to surface. Plankton grow infinitively. Sea at north and south pole, many plankton grow and many fish grow and many seal and penguin and whales are growing. Therefore the study to stir sea water is important subject.

2.4. Electricity generation should be done by coal (Ref 29)

IPCC(Winner of Nobel Peace Prize2012) and United Kingdom government asking electricity generation by oil and natural gas than coal, because coal generate more CO_2 than oil. But CO_2 is main raw material for CO_2 assimilation. Increase of CO_2 increase the speed of CO_2 assimilation. Many reports say that increase of CO_2 is favorable for increase of green area and regulation of climate(ref 63-83)

I think coal is better for the generation of electricity to save the consumption of oil. .When we compare buried amount, coal (162years) is 3 times as much as oil (56 years) and natural gas (81years). We can manufacture many kind of chemical and plastic from oil. Oil is more convenient as transportation fuels. Therefore, oil and natural gas are 3 times more precious than coal. Price of coal is 1/3 of oil. Therefor we can generate electricity by coal at low price. The price of electricity is very important for the competition of productive industry. The price of electricity at China is 1.6-4.5 c/kWh, and India 6 c/kWh. These countries generate electricity by coal. Germany 35 c/kWh, Japan 24 c/kWh.These countries generate electricity by natural gas. The year of oil scare is coming in 50 years. Then we must do liquefaction of coal to get liquid fuel for transportation. In this process, about half energy of coal is lost. We can enjoy our civilized life longer by saving the consumption of oil and natural gas. Gasoline car is shifting to electricity car. This is shift from oil to coal (electricity produced from coal).

2.5. Ocean dumping of radio active substance(ref 39)

The London protocol inhibits the dumping of water with more than de minims levels of radioactivity Japan was hit by a big earthquake 2011 and some atomic energy facilities released radioactive waste water. In the incident, a large amount of radioactive substances are produced by decommissioning of nuclear reactor. Dumping of radioactive waste is not possible by London dumping convention. Japan keeping London Dumping convention most honestly. Therefore Japan is producing a large amount of CO_2 (presume 0.3 billion tons) for its treatment and storage to avoid troubles with other countries and yet Japan cannot eliminate such radioactive materials.Japan cannot export agriculture products to other countries to other countries, because Japan is keeping radioactive compounds in Japan. We must increase atomic energy electricity generation by uranium. Plutonium and nuclear fusion Radioactive wast substance must increase. We must find safe way to throw radioactive substance in deep sea . Sea has infinitive amount of water and deep and wide. We can

dilute to almost zero concentration. Therefore radioactive liquid can be diluted to almost zero concentration Solid radioactive substance can sink to the bottom by as is or after covered with cement

3. Future Prediction (ref 51)

We must protect burn out of fossil

Since industrial revolution, mankind has been using a large amount of fossil fuel for manufacturing of food, iron, aluminium, plastic, and fertilizer. Global warming comes from over burning of fossil. Fossil fuel is a fossil of plants made by CO_2 assimilation from CO_2 and water in 5 billion years. Mankind has been using this fossil fuel in 500 years. Yearly use of fossil fuel is estimated to be reduced 25% by COVID-19. Thus, the term of years when oil, natural gas, and coal can be used is extended from 42 to 56 years, from 60 to 81 years, from 121 to 162 years, respectively.

Until now, our human being has used 1360 billion tons of fossil which is corresponding to around a half of the total reserves of fossil buried in the earth. The remaining fossil is estimated as 1360 billion tons.

When fossil is burned out, we need not worry about global warming. We must worry how we can live civilized life. How can we drive car, airplane, and agriculture machine? How can we generate electricity? We must save the consumption of fossil. We should not spend precious fossil for the elimination of NOx and NP. We must protect burn out of fossil fuel as long as possible.

3.1. Prediction of fossil fuel and life at 2223 (200 years after now)

Human being is using now much fossil as exemplified in the use of 3.4 billion tons of natural gas, 3.1 billion tons of oil, and 5.6 billion tons of coal. About the same amount of remaining fossil as that used so far could be used in the future. However, the remaining fossil is limited. The amount of fossil used every year will become smaller than now. In 2222, a 1/4 amount of remaining fossil will be still available. We must limit the use of fossil to get food like agriculture machine and fishing boat. The number of sailing boats will increase. The number of cars and airplanes will become much fewer. Leisure trip must be limited. The use of fossil for air conditioning must be limited. We must depend on woods. There is 80 billon tons of wood in the world and increasing 1-2% annually. Tree grows quickly if sufficient N and P are provided. We must provide enough NP for the promotion of plant growth.

3.2. Prediction of life at 12223 (ten thousand years after now)

Fossil and uranium will be used up in thousand years. Then we must find the method to get energy by nuclear fusion and we will live eternally.

4. Discussion at the conference PC27 , G20 2022 and G7 Hiroshima 2023

- Should develop cuntries pay money to developing countries? Main discussion point at PC 27 2022 at Egypt was how much money should pay from developed country to developing country.

Correct answer is : Pay is unnecessary. Developed country must stop global warming by next PC 28. Global warming can be stopped by stopping of put in ammonia to the exit gas. Then CO_2 assimilation is accelerated and 10 billion tone CO_2 is fixed and13.1x1016 kcal is absorbed. And earth will cool down. Global warming will stop as written at heat balance part. Then payment of developed counties become unnecessary. And much food is produced.

- Should Japan pay money to developing countries?

At PC27 2022 ,Japan is proposing to pay some money to developing countries. But it is better to stop paying. Japan can stop global warming by stop to put in ammonia to the exit gas and can stop global warming and absorb heat and cool down the earth and and stop global warming and get grain and fish. Activation of CO_2 assimilation is essential to stop global warming

- G20 summit 2022 Electricity generation by coal

10 countries including US, Japan are planing to pay 20 billion dollar to Indonesia to change from coal electricity generation to LPG electricity generation. But I think that these countries should not pay. Indonesia are considering that electricity generation should be done by coal. Buried amount, coal (132 years) is 2 times as much as natural gas(60

years). LNG is more convenient as transportation fuels. Therefore, oil and natural gas are 3 times more precious than coal. Price of coal is 1/3 of LNG. The price of LNG is rising. Therefor we can generate electricity by coal at low price. The price of electricity is very important for the competition of productive industry. Then we should not pay 20 billion dollar to change from coal to LNG Stopping of ammonia addition to the exit gas and stopping of waste water clean center should be done immediately. Then consumption of important fossil is avoided and CO_2 assimilation is activated to produce much grain and fish and can get high GDP and growth.

- G7 2023 Hiroshima Japan

G 7 2023 will be held at Hiroshima Japan April 19-21. Conference should stop the global warming by doing following items.

- Stop the addition of ammonia to the exit gas to increases CO_2 assimilation and food production
- Close waste water clean center to stop the elimination of nitrogen and phosphorous
- Use coal for the electricity generation
- Study the safe method to sink radioactive wast substance to the bottom of deep sea

5. Conclusion

Stopping of ammonia addition the exit gas and stopping of NP elimination in waste water can activate CO_2 assimilation and can produce much grain and fish and can get high GDP and growth.

Compliance with ethical standards

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