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Research Paper

# Stopping of NOx,NP elimination is easy method to protect global warming

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***Abstract***
*Fossil fuel burn releasing 36 billion tone $CO_2$ and heart. Burning reaction is reverse reaction of $CO_2$ assimilation. If we can compensate the generation of $CO_2$ and heart of burning with the absorption of $CO_2$ and heart by $CO_2$ assimilation, global warming will be protected. To promote CO2 assimilation, supply of nutrient N and P is essential. Many officials of developed countries saw millions papers that NOx is toxic substance at internet. Internet provide no paper that NOx is fertilizer. They decided to eliminate NOx NP. Then concentration of N,P in sea water decreased. Then CO2 assimilation is retarded. plankton growth is reduced and fish production reduced and CO2 is increasing. 20ppm every year . Global warming is in progress.*
*1.44 billion tone NOx is produced when 14 billion fossil fuel is burned. Waste water contain much NP. 0.6 billion tone NOx and 0.2 billion tone NP are eliminated at developed countries . These NOx and NP are best fertilizer. The countries who do not do NOx NP elimination can fix CO2 and produce much food and are prospering. The countries who do NOx NP elimination are increasing CO2 and declining.*
*Stop of NOx NP elimination at developed countries are essential for the protection of global warming, If 7 developed countries stop elimination of NOx NP, global warming will stop much sooner than 2050*
*Electricity generation should be done by coal.*
*Solar electricity generation should be done at no green land.*
*Fossil fuel will be burned out in 200 years. We must worry how can we live civilized life.. We should not spend precious fossil for the elimination of NOx NP. We must protect burn out of fossil fuel as long as possible*
***Keywords:*** *CO2 , NOx NOx elimination, NP elimination ,protection of global warming , CO2 assimilation,*

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## I. INTRODUCTION

The earth is warmed up and CO2 increasing 20 ppm every year. The author investigated the increase of CO2, fix of CO2 ,how CO2 is fixed and what kinds of fixed products. How much NOx is produced how NOx is eliminated , compared the countries who eliminate NOx NP and countries who use NOx NP . Compared GWPR（Global Warming Protection Ratio), GDP . At 7 developed countries who eliminate NOx, NP as pollution substance, CO2 assimilationist retarded, CO2 fix is retarded, GWPR is high and GDP growth rate is low. At developing countries who use NOx NP as fertilizer, CO2, assimilation is done quite well. CO2 assimilation increased. Production of grain and fish increased. GWPR is low and GDP increase rate is high.

Global warming come from the elimination of NOx NP at 7 developed countries. Therefore I am proposing the plan many time "stopping of NOx NP elimination is essential for the protection of global warming" (ref 1-45). This paper is a summary of my 45 papers.

The plant make amino acid, chlorophyl and nucleic acid. Plant take CO2 and nitrogen and phosphorous..The plant take CO2 and N and P by same composition as plant itself. C:N:P = 25:1:0.06. Plankton take C,N,P by the ratio C:N:P= 6.6:1:0.06(ref46-49) .Large amount of N P are necessary. Nature set up system to provide nutrient N. When some thing is burned, or by sunder NOx is produce by the reaction of N2 and O2 to produce NOx. NOx is best nitrogen source.
But officials of developed countries, look at internet millions reports that NOx is very toxic substance and made rule to eliminate NOx by the reaction with ammonia.
$4\ NO + 4NH_3 + O_2 \longrightarrow 4\ N_2 + 6\ H_2O$
One nitrogen fertilizer is destroyed by other fertilizer, Eliminated NOx is 0.6 billion tone. Used NH3 is 0.34 billion tone. 0.193 billion tone butane is used for the preparation of NH3. These are tremendous los of natural resources. NP in waste water are eliminated as water pollution materials.

CO2 assimilation is retarded. Then CO2 fix is retarded and CO2 is increasing and global warming is progressing.
Many say global warming come from CO2. But real global warming come from the retardation of CO2 assimilation.
By the retardation of CO2 assimilation, agriculture and fish industries are retarded. GDP increase rate does not increase.Wealth of nation decreasing. Therefore stopping of NOx NP elimination at developed countries is essential for the protection of global warming , to fit Paris agreement and to become rich.
Global warming has progressed. Paris agreement was set up. Pari agreement ask us . CO2 emission must be same as CO2 fix by 2050.
GWPR(global warming protection ratio) = CO2 emission/ CO2 fix =1

About 51billion tone CO2 is emitting yearly in the world. CO2 emission can be obtained from internet. CO2 fix is estimated from area of the country. 1000 tone CO2 is fixed at 1 Km2 area.
W.Nordhaus won Nobel economic Science prize (ref 50-54). He insist Global warming come from the increase of CO2 and asking the storage of CO2 at under ground , and discovery of new reaction.
But I think that global warming does not caused by increase of CO2. Global warming is caused by the retardation of CO2 assimilation by elimination of NOx NP which do assimilation reaction with CO2. There are many papers that increase of CO2 give good effect for climate change(ref 55-73)
Out of 51 billion tone CO2, 18.8 billion tone CO2 is used for plankton, 6.6 billion tone CO2 is used for grain, 25.6 billion tone CO2 is used for tree, glass. And 18.0 billion tone CO2 is remaining. If developed country do not eliminate 0.6 billion tone NOx 0.6x 25 = 15 billion tone CO2 can be fixed. If developed country do not eliminate 0.2 billion tone NP, 0.2x25= 5 billion tone CO2 can be fixed. 15+ 5 = 20 billion tone CO2 can be fixed.
If developed countries stop the elimination of NOx NP, CO2 assimilation is activated , global warming will stop and grain and fish production increase and GDP will increase Paris agreement , CO2 zero and growth can be accomplished sooner than 2050.

1.. Elimination of NOx,NP decreased nitrogen concentration and fish production
I was born in 1930 at small town Kojima ,Kurashiki,Japan.This town is located at sea beech in Seto inland sea.Japan. Bottom of the sea was filled with sea weed( eel glass). There is swimming beach named Hikiami beach seine. When swimming at tide is down, legs touched sea weed and stone fish. Sea shore was filled with dried sea weed especially that cast ashore. The sea was filled with plankton and fish.Bream (tai),Eel (unagi), Sea eel(anago), Octopus, Sardine, Shrimps, Sand lance(ikanago).The sea was filled with small fishing boat. At around 1980, red tide appeared at near fishery plant, at Kagawa prefecture Japan. Then Japan government build 2200 water clean center at all over of Japan.and eliminated nitrogen and phosphorous completely by activated sludge process. Also NOx in exit gas of all plant was eliminated by ammonia. Then nitrogen concentration of sea deceased . From 1980 0.40 mg/l to 2015 0.05 mg/l. Sea weed do not grow. Plankton do not grow Nori growing plant stopped. Fish production decreased from 1980 0.45 millions tone to 2018 0.05 millions tone as shown in table 1 (ref 5,13,74)

Relation of NOx ,NP elimination with Fish production at Seto inland sea

Table 1

| | N mg/l | fish mill t | total nitrogen t/day | total phosphorous t/day |
|---|---|---|---|---|
| 1980 | 0,40 | 0. 45 | 670 | 60 |
| 1985 | 0.40 | 0.45 | 620 | 46 |
| 1990 | 0,30 | 0.32 | 620 | 42 |
| 1995 | 0,22 | 0. 22 | 620 | 40 |
| 2000 | 0.22 | 0.21 | 600 | 39 |
| 2005 | 0.15 | 0.22 | 450 | 32 |
| 2010 | 0.05 | 0.10 | 400 | 25 |
| 2015 | 0.05 | 0.08 | | |
| 2018 | 0.05 | 0.05 | | |

Hyogo prefecture demonstrated the decreased production of sand lance ( ikanago) by the decrease of nitrogen concentration. .Ikanago production decreased from 8000 tone in 1980 to 1500 tone in 2016 by decrease of N concentration from 12 micro mole to 1 micro mole/ as shown in Table 2.(ref 75)

Table 2.

| | Sand lance tone | N concentration micro mole |
|---|---|---|
| 1980 | 8000 | 12 |
| 1985 | 4000 | 5 |
| 1990 | 7000 | 9 |
| 2000 | 2050 | 5 |
| 2010 | 2530 | 3 |
| 2016 | 1500 | 3 |

2. Much electricity is necessary for elimination of NP

I investigated Yamazaki waste water purification center at Yamazaki,Kamakura in Japan(ref 35). This center cover 96881 persons. Water 98287 m3 containing Nitrogen 40mg /l, Phosphorous 4.2mg/l is treated by activated sludge process. Air is bubbled for ten hours to give water containing Nitrogen 7.5 mg Phosphorous 2.7 31mg/l . Consuming 8841200 kWh electricity. This data showed that 7.34 Kg Nitrogen, 2.65 Kg Phosphorous is eliminated in one day at this center. This data indicate 7.34x 120000000/96881x365 = 3318 tone nitrogen, 318 tone phosphorous are eliminated in Japan in one year. Population of Japan is 1.2 billion. 8841200 x 120000000/96881= 110 billion kWh electricity is consumed in Japan for the treatment of waste water. This correspond 100880/ 110=1.11% of total electricity consumption 100880 kWh , about 1/3 of solar electricity of Japan

If wastewater purification is not done in Japan, 0.03315x 20=0.663 billion tone CO2 is fixed and 33 million tone plankton can grow and 33 million tone fish will be produced.

World is presumably eliminating N and P 20 times of Japan. 331.8million tone x 20 = 0.663 billion tone nitrogen and 119x 20 = 239.3 million tone phosphorus are eliminated at wastewater purification center. 2393110x 20 = 220 billion kWh electricity is consumed for the treatment of wastewater of the world.

If wastewater purification is not done at developed countries, 0.663x 20=13.26 billion tone CO2 can be fixed And 13.26/20= 0.66 billion tone fish will be produced.

3. NOx produced by burning is good promotor for CO2 assimilation. NOx should be released as it is. Bon fire inhibition rule should be abandoned

In Japan waste material must burn at incinerator ( Ref 33). 0.4289 billion tone garbage(331 kg per person) is produced. Japan constructed 1893 garbage incinerators. Top number in the world.

Japan reconstructed high temperature garbage incinerator in 2002. About 2 billion CO2 is produced for construction of these garbage incinerator.

In Japan very special law about the garbage incinerator was set up in 2002 by the reason much NOx is produced at lower temperature.(Ref.37) By this rule, incinerator must be burned at higher temperature than 800 °C by adding excess fuel to keep higher temperature. Corrugated carton and fallen leaves must be burned at high temperature incinerator. Bon fire is inhibited by the reason bon fire produce much NOx.Burning of rice straw wheat straw at rice field is not possible. Big earth quake and tsunami happened in east Japan in 2011. Debris disposal was not allowed to burn on site. Debris disposal must transfer to far away district having high temperature incinerator consuming much fuel and money. Operation of this high temperature incinerator is using much excess fuel releasing much CO2. There is Nagoshi clean center at Kamakura ,Japan This clean center burn garbage 0.03 million tone at Kamakura producing 0.045 million tone CO2. Exhaust gas contain NOx. To eliminate NOx , this center used 40.94 kg ammonia in 2018. This mean 40.94 x 30/17 = 72.256 kg NO is eliminated by ammonia at Negoshi clean center. (ref 37).Population of Kamakura is 0.172 million. This data indicate 72.256 x 120000000/172000 = 50.41 million kg NO is eliminated at burning of garbage in Japan. 40.94x 12000/17.2= 285.64 million kg NOx is eliminated by 255 million kg ammonia. 255 million kg ammonia is produced from 54 million kg H2 . If NOx elimination is not done 706 million kg CO2 is not produced. 285 million kg NO x can fix 0.285x 25 = 7.125 million tone CO2 .

4. Burning of wood increase food production by NOx

Slash and burn agriculture is carried out for many thousand years in the world. Wood is burned and wood turn to the field which can produce crops. Ash produced by burning is said to be effective substance. But real effective substance is NOx( Ref 37). When tree 1000 tone is burned, nitrogen in tree change to NO and N2 react with O2 to give NO. And 1000/ 25 = 40 tone NOx is produced. And 40 tone NOx can grow 40 x 25 = 1000 tone plant. By burning of some thing, by cooking of rice, by burning of tree for worm up the room, by burning of straw, by bonfire, by mountain fire, by fire festival , some thing / 25 tone NOx is produced(Ref 4,7,36). Decay of tree and timber need many years. Tree and timber are burned, CO2 and NOx are produced at the same time. Recycles of carbon, nitrogen are done quickly.

Forest firs of Brazil are now big topics . Brazil government are trying to convert tropical rainy forest to agri-culture land. $3.8 \times 10^5$ Km2 forest is now changing to farm yearly. This kind of action is done at Africa and at Russia at Indonesia and at Malaysia . In this process, forest is burned and agriculture land is made. By changing forest to firm, valuable crops, food are produced. In the process of burning , forest fir can happen. Many people say this process destroying forest and produce much CO2 and progressing global warming.

But I think to convert forrest to firm land must be evaluated by comparing the merit and demerit . Slash and burn agriculture have big merit. . Burn of wood produce much fertilizer. .When 1000kg dry timber is burned, 1000x 44/30=1470 kg CO2 is produced and 1470x1/25 =58.8 kg NOx is produced. 1470 kg CO2 and 58,8 kg NOx will produce 58.8 kg x25=1470 kg plant or grain by CO2 assimilation..

5. NOx increase food production and reduce CO2 increase

When 12 billion tone fossil is burned. And 12x 44/ 14= 36 billion tone CO2 is produced. And 36x1/25= 1.34 billion tone NOx is produced. One person emit 6 tone CO2. 76x 6 =4.56 billion tone CO2 is produced. Animal other than human produce 4.56 billion tone CO2. Burning of wood produce 6.0 billion tone CO2 Total 36+ 4.56+ 4.56+ 6= 51 billion tone CO2 is produced. Earth is 70% sea ,and 30% land. Fix of CO2 is carried out 70% at sea and 30% at land. Out of 51 billion tone, CO2 18.8 billion tone is fixed by plankton. CO2 6.6 billion tone is fixed for grain production. CO2 25.6 billion tone is fixed by tree, glass production. CO2 18 billion tone is unfixed and remaining. China produced 10.64 billion tone CO2. China produced 0.0815 fish and fixed 1.63 billion tone CO2. China fixed 10 billion tone CO2 by tree and glass at wide area. China does not increase CO2. Japan was producing 0.012 billion tone fish fixing 0.24 billions tone CO2 before 1980 with out elimination of NOx, NP. But after 1985, Japan eliminated all NOx ,NP. Then fish production decreased to 0.0045. Japan is increasing 0.9 billion tone CO2.

**CO2 em(Fossil** CO2emission), NOx( NOx emission), fish production , CO2 f (CO2fixing by plankton used for fish production), Grain, CO2 g (CO2 fixing used for grain production), CO2t (CO2 used for Tree Grass production), of many countries are shown in Table 3.( Ref 16)

Table 3 CO2em,NOx,, Fish, CO2f,Grain,CO2g,CO2t,Population , CO2inc of countries

| Country | CO2 em Hm t | NOx hm t | Fish hmt | CO2f hmt | Grain hm t | CO2g hm t | CO2t hm l | Population | CO2 inc hm t |
|---|---|---|---|---|---|---|---|---|---|
| World | 510 | 14.4 | 1.6 | 188 | 33 | 66 | 256 | 76 | 180 |
| China | 106.4 | 4.25 | .815 | 16.3 | 5.57 | 11.2 | 100 | 13.5 | 0 |
| United S | 51.0 | 2 | .055 | 1.1 | 4.4 | 9 | 51 | 3.1 | 0 |
| India | 24.6 | 1 | .105 | 2.0 | 2.95 | 6 | 28 | 13 | -9 |
| Russia | 19.6 | 0.63 | 0.049 | 0.98 | 0.92 | 0.9 | 32 | 1.43 | -12 |
| Japan 2019 | 12.5 | 0 | .0454 | 0.92 | 0.04 | 0.08 | 3 | 1.27 | 9 |
| 1980 | 8 | 0.5 | .12 | 2.4 | 0.08 | 0.16 | 3 | 1.27 | 2.6 |
| Germany | 7.8 | 0 | 0.027 | 0.05 | 0.47 | 0.9 | 3.5 | 0.83 | 5 |
| Iran | 6.3 | 0.25 | 0.007 | 0.14 | 0.18 | 0.36 | | 0.80 | |
| Canada | 5.6 | 0.22 | .087 | 0.17 | 0.51 | 1.02 | 94 | 0.37 | - 88 |
| Indonesia | 5.0 | 1.97 | 0.232 | 4.6 | 0.44 | 0.89 | 14 | 2.39 | - 9 |
| Mexico | 4.7 | 0.2 | 0.015 | 0.3 | | | 1.9 | 1.23 | |
| U. K | 4.0 | 0.16 | 0.007 | 0.14. | 0.2 | 0..4 | 2.4 | 0.66 | 1.6 |
| Turkey | 4.0 | 0.16 | 0.004 | 0.08 | 0.33 | 0.66 | 7 | 0.80 | |
| S Africa | 4.0 | 0.17 | 0.006 | 0.12 | .12 | .24 | 1.2 | 0.33 | |
| Italy | 3.5 | 0.14 | 0.002 | 0.04 | 0.16 | 0.3 | 3 | 0.60 | 0.5 |
| France | 3.3 | . 0013 | .0006 | 0.12 | 0.52 | 1 | 8. | 0.67 | -5 |
| Poland | 3.0 | .09 | | | 0.32 | .64 | 5 | 0.38 | -2 |
| Thailand | 2.8 | 0.11 | 0.015 | 0.30 | 0.38 | 076 | .5 | 0.63 | -2.2 |
| Spain | 2.6 | 0.10 | 0.013 | 0.26 | 0.21 | .042 | 2.6 | 0.46 | 0 |
| Egypt | 2.3 | 0.7 | 0.033 | 0.66 | 0.0.3 | 0.6 | | 0.94 | |
| Vietnam | 2.1 | 0.7 | 0.064 | 1.2 | .50 | 1 | 3 | 0.86 | -1 |
| Argentin | 1.9 | 0.01 | 0.018 | 0.36 | 1.02 | 2.8 | 2 | 0.25 | |
| Pakistan | 1.7 | 0.67 | ..003 | 0.06 | 0.38 | 0.7 | 7.9 | 1.98 | -5 |
| Australia | 1.35 | .0025 | 0.002 | 0.04 | 0.70 | 0.65 | 3 | 0.25 | -1.6 |
| Philippin | 1.1 | 0.045 | 0.90 | 0.27 | 0.54 | 0.1 | 3 | 0.92 | -1.9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Nigeria | 0.9 | | 0.007 | 0.013 | 0.26 | 0.5 | 1.94 |
| Columbia | 0.8 | .003 | 0.006 | 0..12 | 0.08 | 1.1 | 0.50 |
| Malaysia | 0.28 | 0.11 | 0..016 | 0.32 | 0.02 | 0.4 | 0.28 |
| Netherland | 0.1 | 0.16 | 0.003 | 0.06 | 0.08 | 0.018 | 0.17 |

6. After start of NOx,NP elimination, GWPR increased from 1 to 1.3

Since the industrial revolution, burning of fossil and production of CO2 increased. and NOx increased greatly. As the result CO2 emission increased and Grain and fish production increased. 1975 grain 1.1billion tone increased to 2019 2.7 billion tone. Especially grain production of India increased. In 1960 grain 0.07 billion t, in 2010 0.25 billion t. Fish production of China increased . In 1960 0.0015 billion t, in 2017 0.076 billion t.

Since 1980, CO2 fix start decrease than emission. In 1980 CO2 emission 20 billion tone ,fix was 15 billion tone., In 1990, emission 22 billion and fix was 14 billion tone. In 2000 emission 25 billion tone and fix was 15 billion tone. In 2010 emission 30 billion tone and fix was 17 billion tone. In2019 emission 38 billion tone and fix was 22 billion tone. This time is same as 7 developed countries started NOx, NP elimination. By the elimination of NOx,NP, CO2 assimilation retarded and CO2 fix retarded. Japan decreased fish production from 0.011 billion t in 1985 to 0.032 billion t in 2017 Japan decreased GDP growth rate from 6 % before 1980.. to 1% after 1985. because Japan doing NOx, NP elimination most severely.as shown in Table 4

CO2 emission, CO2 fix,NOx emission, Grain production, GrainJa (Grain production of Japan) GrainInd (grain production of India), Fish (fish production of the world), FishJa (fish production of Japan, GWPRand GDPgJ (GDP growth rate in Japan) are shown in Table 4 (Ref 22-24)

**Table 4**

| Year | CO2em Hm t | CO2f hml t | NOxem hm t | Grain hmt | GrainJa hmt | GrainInd hm t | Fish hmt | FishJa hm t | GWPR | GDPgJ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1900 | 20 | 20 | 0.8 | | | | | | 1 | |
| 1920 | 30 | 30 | 1.2 | | | | | | 1 | |
| 1940 | 50 | 50 | 2 | | | | 0.02 | | 1 | |
| 1960 | 100 | 100 | 4 | | | 0.7 | 0.35 | 0.035 | 1 | 6 |
| 1970 | 150 | 150 | 6 | 11 | 0.13 | 1. | | 0.062 | 1 | 7 |
| 1975 | 170 | 170 | 6.8 | 12 | 0.1 | | | 0.095 | 1 | 6.5 |
| 1980 | 200 | 150 | 8 | 14 | 0.1 | 1,2 | 045 | 0.11 | 1.33 | 6 |
| 1985 | 210 | 140 | 8.4 | 15 | 0.095 | | 1.05 | 0.12 | 1.33 | 1 |
| 1990 | 220 | 140 | 8.8 | 17 | 0.09 | 1.7 | 1.1 | 0.09 | 1.5 | 1 |
| 2000 | 250 | 150 | 10 | 22 | 0..085 | 2.2 | 1.4 | 0.085 | 1.57 | 1 |
| 2005 | 270 | 160 | 10.8 | 21.5 | 0.082 | | 1.55 | 0.05 | 1.68 | 1 |
| 2010 | 300 | 170 | 12 | 23.5 | 0.08 | 2.5 | 1.65 | 0.04 | 1.76 | 1 |
| 2017 | 360 | 220 | 14.4 | 27 | 0.075 | | 2. | 0.032 | 1.63 | 1 |

7. The countries who do NOz NP elimination are increasing CO2 and declining. The countries who use NOx NP can get much food from CO2 and are prospering.

CO2em(CO2 emission),CO2fix(fixable CO2), CO2em/p (CO2 emission per person ) , NOxcon(NOx concentration at exit gas),W dump(Wastewater dumping), electricity price, GWPR( global warming protection ratio), GDP(GDP increase ratio) of 11 countries are shown in Table 5(Ref 19,43)

**Table 5**

| Country | CO2 em | CO2fix | CO2em/p | NOxcon | W Dump | elect price | GWPR | GDP |
|---|---|---|---|---|---|---|---|---|
| | hmt | hmt | tone | g/kWh | | c/k Wh | | inc rate |
| World | 510 | 370 | | | | | 1.38 | |
| China | 106 | 100 | 8.0 | 1.6 | do | 1.6-4.5 | 1 | 6.9 |
| India | 24.6 | 24.6 | 1.9 | 1.6 | do | 6 | 1 | 7.1 |
| Indonesia | 5.0 | 6.0 | 2.1 | 1.6 | do | 10 | 0.83 | 5.2 |
| USA | 51.0 | 510 | 19.1 | 0.5 | no | 12 | 1 | 1.48 |
| Japan (2018) | 12.5 | 3.8 | 8.9 | 0.1 | no | 24 | 3.3 | 1.03 |
| (1980) | 5.5 | 5.5 | 3.1 | 1.6 | do | | 1 | 7.0 |
| Russia | 19.6 | 19.6 | | 0.61 | | 17 | 1 | 0,8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Germany | 7.8 | 3.5 | 8.9 | 0.31 | no | 33 | 2.2 | 1.83 |
| U. K | 4.0 | 2.4 | 5.6 | 1.3 | no | 15.4 | 1.7 | 1.8 |
| Italy | 3.5 | 3.0 | 5.8 | 0.5 | no | 28 | 1.2 | 0.88 |
| France | 3.3 | 3.3 | 5.0 | | no | 19 | 1 | 1.2 |
| Canada | 5.6 | 7 | 18 | 1,3 | no | 8.1 | 0.8 | 1.44 |

The countries who do NOx elimination : Japan 0.1 g/kW, USA 0.6 g/kWh, Germany 0.31 g/kWh, UF 1.3 g/kWh, Italy 0.5 g/kWh, show high electricity price: Japan 24 c/kWh, USA 12 c/kWh, Germany 33 c/kWh, UK 15.2 c/kWh,, Italy 28 c/kWh GWPR of these countries are higher than 1. GDP increase rate of these countries are 1-2..

The countries who do not NOx,NP elimination] China , India, Indonesia 1.6 g/kWh. GWPR are 1 or less than 1. . DGP increase rate are 5-7

As 1 molecule of NOx can fix 25 molecule of CO2. China can fix 0.984x25x44/30 = 36.08 billion tone CO2, USA can fix 0.192x 25x 44/30 =7.04 billion tone CO2, India can fix0.86x25x44/30=3.15 billion tone CO2. Japan can fix 0.4x25x44/30= 1.47 billion tone CO2. Canada can fix 0.52.4x25x44/30= 1.91 billion tone CO2. Germany can fix 0.244x25x44/30=0.894 billion tone CO2, France can fix 0.38x25x44/30=1.393 billion CO2. S.Korea can fix 0.342x25x44/30=1.25 billion CO2.UK can fix 0.184x25x44/30=0.674 billion tone CO2. Italy can fix 0.56x25x44/30=0.205 bullion tone CO2.

The countries who do not NOx elimination can provide low electricity : China 1.6-4.5 c/kWhD。India 6 c / kWh, Indonesia 10 c/kWh.

Low price country is increasing CO2 assimilation, CO2 fixing, food production .

. Low price electricity is very favorite for the production of good and can export many good to high electricity country. For example most electricity generation panel is produced in China and exported to all over the world. The countries who use NOx and NP can increase GDP rapidly. China is increasing GDP about 6 %. DGP of China was 4% of the world in 2000. 16 % in 2019. The countries who eliminate NOx,NP cannot increase GDP rapidly. DGP of USA was 31 % of the world In 2000 25 % in 2019.

8. Developed countries should stop NOx and NP elimination to protect global warming , to fit Paris agreement , CO2 zero , growth

Developed countries are eliminating 0.6 billion tone NOx and 0.2 billion tone NP. 0.6 billion tone NOx can fix0. 6x 25 = 15 billion tone CO2. To eliminate 0.6 billion tone NOx, 1 billion tone CO2 is produced. Therefore 15 + 1 = 16 billion tone CO2 is produced. 0.2 billion tone NP can fix 0.2x 25 = 5 billion tone CO2. To eliminate 0.2 billion tone NP, 0.2x 5=1 billion tone CO2 is produced. Therefore 5+ 1 = 6 billion tone CO2 is produced. If developed countries stop NOx and NP elimination, 16 + 6 = 22 billion tone CO2 will not produced. And global warming will stop

**Electricity generation should be done by coal**

IPCC(Intergovernmental Panel on Climate Change) asking electricity generation by oil and natural gas than coal , because coal generate more CO2 than oil. But I think coal is better for the generation of electricity to save the consumption of oil(Ref 29). Global warming is not caused by CO2.

Global warming is caused by the elimination of NOx,NP which do co-assimilation with CO2. There are many papers that increase of CO2 give good effect for climate change(ref 55-73)

When we compare buried amount, coal (162 years) is 3 times as much as oil (56 years) and natural gas(81 years). 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 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.

**Solar Electricity generation should be done at no green land**

Construction of solar mega system by the sacrifice of wood is not clever way.(Ref 29,75). 1 hector 1000 m2 wood can absorb heart 3.8x $10^6$ kcal and can fix 13.7 tone CO2 . Heart absorption efficiency of solar system cell is 1/3 of green leaf of tree. Tree is best reservoir of CO2 and heat. Solar system cell cannot fix CO2. For the preparation of solar cell material, much fossil fuel is necessary generating much amount of CO2 in compared with the generation of CO2 and electricity by burning of fossil fuel. Therefore construction of solar mega system by the sacrifice of wood is promoting global warming.

1000 m2 cell can generate 114000 kWh and can save 7.5 t CO2 and can absorb 1.3 x $10^6$ kcal For the production of 1000 m2 cell 5 tone CO2 is produced. Electricity generation should be done at no green land. The house

located near wood, cooler is unnecessary. But the house located near solar mega system , cooler is necessary at summer. Japan is promoting global warming by solar electricity generation by the scarify of wood..

**Heat balance of earth (Ref 24)**

On earth 140 billion tone fossil fuel is burned and CO2 3.6 $x10^{10}$ t was produced . And 7.4 x $10^{15}$ kcal is produced. . When we consider the heat produced by animal respiration, 7.4 x $10^{15}$ kcal x 4.6/3.6 = 9.45 x $10^{15}$ kcal is produced.

The earth is also warmed by the heat of atomic energy. Uranium produce 2 x $10^{15}$ kcal heat. Electricity generation capacity of the world is 16868 Tetra watt h . Electricity generation by atomic energy is 2086 Tetra watt h. Therefore 7.4 x $10^{15}$ x 2986/ 10868 = 2 .02x $10^{15}$ kcal evolved by atomic energy.

The earth is also warmed by the heat evolved by animal. Human being eat 1000 kcal food every day and release heat 1000 kcal every day. Population of the world is 76 billion. Therefore human being is releasing 1000 x 365x 76x $10^{8}$ = 2.8x$10^{15}$ kcal in one year. Animal other than human being, caw , bird, whales, seal are producing heat . We can estimate as same as human being 2.8x$10^{15}$ kcal . Therefore total heat is

fossil burning produce 7.4 x $10^{15}$ kcal , atomic energy produce 2.02x$10^{15}$ kcal . Human being produce 2.8x$10^{15}$ kcal . Other animal produce 2.8x$10^{15}$ kcal

Total heat produced is (7.4+2.02 + 2.8+ 2.8) x$10^{15}$ = 15.02 x$10^{15}$kcal. We must absorb 15.02x$10^{15}$ kcal by CO2 assimilation.

CO2 1 mole 44g and water 18 g absorb 114 kcal sun's heat to carbohydrate and 32 g oxygen. If 51 billion t, 5.1x $10^{16}$ g CO2 do CO2

assimilation, 114x 51x$10^{15}$ /44= 132x$10^{15}$ kcal can be absorbed.

CO2 assimilation must be promoted by stopping of NOx elimination and by stopping waste water purification. By stopping NOx elimination. 1.44 billion tone NOx can fix 1.44x 25= 36 billion tone CO2 . Amount of N.P in drainage is around 0.5 billion tone. By using this 0.5 billion tone N.P, we can fix 0.5x 25= 12.5billion tone CO2. By adding 36 + 1.25= 48.5 billion tone CO2 can be fixed. And we can absorb 15 x $10^{15}$ kcal . And earth can be cooled down.

We must protect burn out of fossil

Since industrial revolution, mankind is using large amount of fossil fuel for manufacturing of food , iron, aluminum, plastic and fertilizer. Global warming comes from over burning of fossil. Fossil fuel is fossil of plants made by $CO_2$ assimilation from $CO_2$ and water in 50 billion years. Mankind is now using up these fossil fuel in 500 years. Yearly use of fossil fuel are estimated to be reduced 25% by COVID-19 . Oil is extended from 42 to 56 years, natural gas is extended from 60 to 81 years, coal is extended from 121 to 162 years.

Estimated amount of buried fossil;

Billion tone (ref 8,29,44)

| Fossil | buried amount | yearly use | year |
|---|---|---|---|
| Natural gas | 276.9 | 4.6 —> 3.4 | 60—-> 81 |
| Oil | 173 | 4.1—-> 3.1 | 42——> 56 |
| Coal | 9090 | 7.5—> 5.6 | 121—> 162 |
| Uranium | | | 124 |

Our human being used around half of fossil 1360 billion tone. Remaining fossil is estimated as1360 billion tone.

When fossil Is burned out, we need not worry about global warming. We must worry how can we live civilized life. How can we drive car, air plane, agriculture machine. How can we generate electricity. From what can we make plastic and solar cell module. We must save the consumption of fossil. We should not spend precious fossil for the elimination of NOx ,NP. We must protect burn out of fossil fuel as long as possible.

Prediction of fossil fuel and life at 2220 (200 years after now)

Human being are using now much fossil. Natural gas 3.4 billion tone, oil 3.1 billion tone, coal 5.6 billion tone. About same amount of new fossil will be found in the future. But fossil is becoming scare. Yearly use will become smaller than now. In 2200 ,still 1/4 amount of fossil will remain. We must limit the use of fossil to get

food like agriculture machine and fishing boat. Sailing boat will increase. Numbers of car and airplane will become much fewer. Leisure trip must be limited. Use of fossil for air conditioning must be limited. We must depend on wood. There is 80 billon tone wood in the world and increasing 1-2 % annually. Tree grow quickly if sufficient N and P are provided. We must provide enough NP for the promotion of plant growth

## II. SUMMARY

Global warming and fossil fuel burn out can be protected by the promotion of CO2 assimilation by supply of nutrient N and P by following 7 items.

1.Elimination process of NOx by ammonia at power station, chemical station and iron work station should be stopped.

2**.** Elimination process of nutrient N and P in drainage should be stopped. Ocean dumping, field dumping and forest dumping of excreta are recommended.

3 Stop the unproductive uses of fossil fuel. Like war, auto race, leisure cruising, leisure trip,

4. Stop the unnecessary economic stimulus measures such as renewal of building and car and construction of unnecessary building, road and rail way.

5. Restriction rule of NOx emission of car should be loosed putting emphasis on fuel efficiency.

6. Stop the construction of solar cell system by the sacrifice of wood.

7 Bon fire should be encouraged. Bon fire ban rule should be abandoned.

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