

## Effect of NO<sub>x</sub> Elimination on Electricity Price, Fish Production, GDP and Protection of Global Warming

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### Abstract

Much NO<sub>x</sub> is produced when fossil is burned. Many governments set up the law to eliminate NO<sub>x</sub>, by the reason NO<sub>x</sub> is pollution gas and not good for health. And also Drainage NP are eliminated. Some other many governments are welcoming NO<sub>x</sub> as fertilizer for plant and encouraged the use of NO<sub>x</sub> and Drainage NP for plankton growth and getting many fish. I could find the data that how much NO<sub>x</sub> is eliminated at 11 countries. The countries who do not do NO<sub>x</sub> elimination and do not do NP elimination are getting many fish, fixing much CO<sub>2</sub> and electricity price is low and producing many product and increasing GDP. The country who do NO<sub>x</sub> elimination is decreasing fish production and increasing CO<sub>2</sub> emission, promoting global warming and electricity price is high and GDP growth rate is low. Therefore NO<sub>x</sub> elimination and Drainage NP elimination should be stopped for the promotion of CO<sub>2</sub> assimilation, for the production of grain and fish, and for the elevation of GDP growth rate.

**Keywords:** NO<sub>x</sub>; NO<sub>x</sub> elimination; Protection of global warming; Electricity price; Fish production, GDP

### Introduction

The earth is warmed by the fossil fuel burning releasing CO<sub>2</sub> and heat. The plant is growing by CO<sub>2</sub> assimilation absorbing CO<sub>2</sub>, producing carbohydrate and O<sub>2</sub>. To promote CO<sub>2</sub> assimilation, supply of nutrient NP is essential. Much NO<sub>x</sub> is produced as by product of burning. NO<sub>x</sub> is a nitrogen fertilizer and promotor of CO<sub>2</sub> assimilation. But NO<sub>x</sub> is hated as pollution gas. Many governments set up law to eliminate NO<sub>x</sub> in burned gas and forced to eliminate NO<sub>x</sub> using ammonia. This reaction is the reaction of one fertilizer with one other fertilizer. This gives tremendous loss of natural resources. NP in drainage is also hated as pollution substance and NP elimination is carried out at many country. Elimination of NO<sub>x</sub> and NP are decreasing CO<sub>2</sub> assimilation, decreasing plant growth and promoting global warming. I am insisting that NO<sub>x</sub> and NP are critically important compounds and the elimination of NO<sub>x</sub> and NP should be stopped at previous papers [1-6].

In this paper, I wish to show how much damages are given to the country who do NO<sub>x</sub>, NP elimination by comparing the effect of NO<sub>x</sub> elimination on electricity price, fish production, CO<sub>2</sub>f plankton (CO<sub>2</sub> fixed by plankton) and GDP (Gross Domestic Product) of 11 countries.

### Elimination of NO<sub>x</sub> and Elimination of Nutrient N, P

The earth is warmed by the increase of carbon dioxide. Carbon dioxide 360 billion tone was produced in 2016. Carbon dioxide 218 billion tonne was fixed in 2016. This mean 142 billion tonne CO<sub>2</sub> increased. Paris agreement ask us to reduce carbon dioxide emission. And no increase of carbon dioxide. Same amount of CO<sub>2</sub> must be fixed as emission.

Nature has system to change N<sub>2</sub> to nutrient nitrogen. By high temperature at fireplace for cooking, burning of wood [1,2], thunder [4-6]. NO<sub>x</sub> is produced from N<sub>2</sub> and O<sub>2</sub>, NO<sub>x</sub> is a gift from nature [6]. We should not against nature. We should use NO<sub>x</sub> as it is. In 2016 fossil 140 billion tonne was burned and CO<sub>2</sub> 360 billion tonne and NO<sub>x</sub> 14.4 billion tonne are produced. If we use all NO<sub>x</sub> for the fixing of CO<sub>2</sub>, we can fix 14.4 × 25 = 360 billion tonne CO<sub>2</sub>. As C/N ratio of plant is around 5/1-50/1 (average 25/1) and one molecule of NO<sub>x</sub> can fix 25 molecule of CO<sub>2</sub>.

I wish to insist that NO<sub>x</sub> elimination should be stopped. Because

toxicity of NO<sub>x</sub> is not so serious when it is released at no person district. NO<sub>x</sub> is essential for plant to grow. NO<sub>x</sub> is essential for the production of grain and fish for the promotion of health and long life.

I am now showing how NO<sub>x</sub> elimination gave significant effect on electricity price, fish production, CO<sub>2</sub>f plankton and GDP growth rate. CO<sub>2</sub> em (CO<sub>2</sub> emission), NO<sub>x</sub> con (NO<sub>x</sub> concentration in exhaust gas), electricity, price, fish, CO<sub>2</sub>f plankton, GDP of 11 countries are shown in Table 1.

### NO<sub>x</sub> Concentration of Many Countries

When fossil is burned, carbon dioxide is emitted and about 1/25 NO<sub>x</sub> of produced CO<sub>2</sub> is also produced as by product. Concentration of NO<sub>x</sub> in exhaust gas at the electricity plant is around 1.6 g/1 kWh. Some country do NO<sub>x</sub> elimination with ammonia and some country do not do NO<sub>x</sub> elimination. Do NO<sub>x</sub> elimination or do not do NO<sub>x</sub> elimination give significant influence on economy, electricity price, import, export, agriculture, fish industry and GDP.

China emitted 106.4 billion tone CO<sub>2</sub>. The content of NO<sub>x</sub> in exhaust gas is 1.6 g/kWh electricity generation. As electricity generation of China is 154220 billion kWh. Then NO<sub>x</sub> emission of China is 2 × 1.6 × 154220 bill tone = 984 million tone. About half of fossil is burned at electricity plant. Other half is burned at other furnace like iron work and chemistry works. Therefore double of NO<sub>x</sub> is produced at all furnace. Electricity price at China is 1.6-4.5 c/kWh.

Japan emitted 12.5 billion tone CO<sub>2</sub>. Japan did not do NO<sub>x</sub> elimination before 1970 and NO<sub>x</sub> content was 1.6 g/kWh and 2 × 1.6 × 10080 = 64.2 million tone NO<sub>x</sub> was released. Since 1980, Japan

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Country	CO <sub>2</sub> em	NO <sub>x</sub> con	NO <sub>x</sub> e	electricity	price	Fish	CO <sub>2</sub> fplankton	GDP
	bill t	g/ kWh	mill t	bill Kwh	c/k Wh	mill t	bill t	growth rate
China	106.4	1.6	984	154220	1.6-4.5	79.38	19.8	6.92
India	24.5	1.6	86	13920		10.11	2,0	7.1
S Korea	5.8	1.6	34.2	5380	8.1	3.33	0.083	2.8
USA	51.7	0.5	192	43670	12	6.05	0.5	1.48
Japan	12.5	0.1(2016)	0.4	10080	24	4.64(2016)	0.11(2016)	1.03
		1.6 (1970)	64.2			13.00(1970)	3.25(1970)	8
Canada	5.5	1.3	52.4	6520	8.1	1.05	0.25	1.4
Germany	7.7	1	24.4	6270	32	0.29	0.07	1.85
France	3.2	1.9	3.8	5570	19	0.91	0.18	1.2
UK	4	1.3	18.4	3560	15.4	0.91	0.002	1.8
Italy	3.5	0.5	5.6	2880	28	0.34	0.008	0.88
Russia	17.6				17	4.61	1.15	-0.22

Note: CO<sub>2</sub> em(CO<sub>2</sub> emission), NO<sub>x</sub> con(NO<sub>x</sub> concentration in exhaust gas) electricity, price, fish, CO<sub>2</sub>fplankton(CO<sub>2</sub> fixed by plankton), GDP growth rate %.

Table 1: CO<sub>2</sub> em, NO<sub>x</sub> con NO<sub>x</sub> e, electricity, price, fish, CO<sub>2</sub>fplankton, GDP of 11 countries.

government set up very strict law to eliminate NO<sub>x</sub> and Drainage NP. Then NO<sub>x</sub> concentration in exhaust gas decreased to 0.1 g/kWh and NO<sub>x</sub> emission decreased to 0.4 billion tone.

China 1.6 g/kWh, USA 0.5, India 1.6, Japan 1.6 in1970, 0.1 in 2016, Canada 1.3, Germany 1.0, France 1.9, S Korea 1.6, UK 1.3, Italy 0.5. China produce NO<sub>x</sub> 984 million tone, USA produce 192 million tone, India 86 million tonne, Japan 0.4 million tonne, Canada 52.4 million tonne, Germany24.4 million tonne, France 38 million tonne, S.Korea 34.2 million tone, UK 18.4 million tonne, Italy 5.6 million tone.

As 1 molecule of NO<sub>x</sub> can fix 25 molecule of CO<sub>2</sub>, China can fix 984 × 25 × 44/30=360.8 billion tonne CO<sub>2</sub>, USA can fix 192 × 25 × 44/30=70.4 billion tonne CO<sub>2</sub>, India can fix 86 × 25 × 44/30=31.5 billion tonne CO<sub>2</sub>. Japan can fix 0.4 × 25 × 44/30=1.47 billion tonne CO<sub>2</sub>. Canada can fix 52.4 × 25 × 44/30=19.1 billion tonne CO<sub>2</sub>. Germany can fix 24.4 × 25 × 44/30=8.94 billion tonne CO<sub>2</sub>. France can fix 38 × 25 × 44/30=13.93 billion tonne CO<sub>2</sub>. S.Korea can fix 34.2 × 25 × 44/30=12.5 billion tonne CO<sub>2</sub>. UK can fix 18.4 × 25 × 44/30=6.74 billion tonne CO<sub>2</sub>. Italy can fix 5.6 × 25 × 44/30=2.05 billion tonne CO<sub>2</sub>.

### Electricity Price of many Countries

When we look at electricity prices of many countries, High electricity price country: Japan 20-24 c/kWh, Germany 32 c/kWh, France 19 c/kWh, UK 15.4 c/kWh, Italy 28 c/kWh At these country, NO<sub>x</sub> elimination is carried out. Most severe NO<sub>x</sub> elimination country is Japan. NO<sub>x</sub> concentration is 0.1 g/kWh And electricity price is high as 20-24 c/kWh.

Low electricity country: China 1.6-4.5 c/kWhD. S.Korea 8.4 c/kWh.

Country who do not do NO<sub>x</sub> elimination can provide low price electricity Low price country is increasing CO<sub>2</sub> assimilation, CO<sub>2</sub> fixing, food production.

Low price electricity is very favorite for the production of good and can export many good to high electricity price country. For example most electricity generation panel is produced in China and exported to all over the world. Then China is increasing GDP. High electricity price country is doing NO<sub>x</sub> elimination by ammonia. By elimination of this NO<sub>x</sub> elimination process, we can reduce 1billion tone CO<sub>2</sub> production. Japan eliminate NO<sub>x</sub> completely. Therefore electricity price 20-24 c/kWh is 2.5 times higher than that of S Korea 8.4 c/kWh. Even through both country are generating electricity by importing fossil from abroad. Construction cost plus fossil cost are added for elimination of NO<sub>x</sub>.

Then electricity price increase. Many industrial company of Japan build factory at outside of Japan.

### Fish Production and CO<sub>2</sub> Fix by Plankton

When we look at fish production of world. China emitted 105.4 Billion tonne CO<sub>2</sub> and 492 million tonne NO<sub>x</sub>. They do not eliminate NO<sub>x</sub> and use NO<sub>x</sub> as promotor of plankton growth. 79.38 million tonne fish is produced and 19.8 billion CO<sub>2</sub> is fixed. India produced 10.11 million tonne fish. Japan produced 13 million tone fish in 1970. But since the elimination of NO<sub>x</sub>, fish production decreased to 4.64 million tone. CO<sub>2</sub> fix by plankton 3.25 billion tonne (1/3 of total CO<sub>2</sub> emission) in 1970 decreased to 0.11 billion tone in 2016.

When we look at fish production region of Japan, west side of Kyushu, Nagasaki, Saga, Fukuoka, Kagoshima prefecture. West of these prefecture is East China sea. Large amount of nitrogen is provided by Yangtze River and concentration of East China sea is very high and large amount of plankton is growing and much fish is produced at this sea. East China sea is fishing center of the world now.

### Influence of NO<sub>x</sub> Elimination on GDP Growth Rate

CO<sub>2</sub> assimilation is most important reaction for all biology on earth. NO<sub>x</sub> is a promotor of plant growth, CO<sub>2</sub> assimilation Therefore NO<sub>x</sub> elimination give great damage on growth of plant. plankton. production of fish, grain, grass and tree. The elimination reaction of NO<sub>x</sub> is a reaction of NO<sub>x</sub> with ammonia. By this reaction, precious fertilizer is destroyed by other precious fertilizer. This is tremendous loss.

1. The country who do not do NO<sub>x</sub> elimination like China (NO<sub>x</sub> c= 1.6 g/kWh, GDP=6.92%), India NO<sub>x</sub> con=1.6 g/kWh, GDP=7.10%), S Korea (NO<sub>x</sub> c=1.6 g/kWh, GDP= 2.8%) can boost high GDP growth rate.

2. The countries who do this reaction NO<sub>x</sub> elimination like USA (NO<sub>x</sub>c=0.5 g/hWh, GDP=1.38%), Japan (NO<sub>x</sub>c=0.1 g/kWh. GDP=1.01%) Germany, (NO<sub>x</sub>c=1.0 g/kWh, GDP=1.85%), UK (NO<sub>x</sub>c=1.3 g/kWh, GDP=1.8%), Italy (NO<sub>x</sub>c=0.5 g/kWh, GDP=0.88%) are consuming much fossil fuel for elimination of NO<sub>x</sub>. Therefore electricity price is higher than no NO<sub>x</sub> elimination country and CO<sub>2</sub> assimilation is retarded. Agriculture and fish industry are retarded. Japan did no NO<sub>x</sub> elimination before 1970, GDP was 8.0 in 1970. Japan started NO<sub>x</sub> elimination in 1980, then plankton production was destroyed and 13 million tone fish was not produced. About 1 million

fisherman lost job. As fish price is 3000 dollar /t. Then 3000x 13 million dollar= 390 billion dollar were lost. Fish price increased 5 times. Average life in Japan : male is 80.50 (third), female is 86.83 (top in the world). The author believe that long life of Japanese come from the habit to eat fish containing glucosamine, hyaluronic acid and chondroitin as a main protein source. Japanese cannot eat fish as before. Fish/Meat ratio of Japanese changed from 99/1 in 1945 to 30/70 in 2017. Therefore Japanese may lose long life record soon.

3. The country whose electricity price is low can produce good with low price Then producing industry progress. And DGP growth rate become higher.

The country do not do NO<sub>x</sub> elimination. 1. Need not fossil to eliminate NO<sub>x</sub> 2.Can have enough NO<sub>x</sub> and can promote CO<sub>2</sub> assimilation. 3 Electricity price is low. 4. Can produce much fish and grain. 5. Can get high GDP growth rate. China 6.92%, India 7.10%. The country do NO<sub>x</sub> elimination show low GDP: USA 1.48%, Germany 1.85%, UK 1.8%, Japan 1.03%, Italy 0.88%.

### Protection of Burn Out of Fossil Fuel

Since industrial revolution, mankind is using large amount of fossil fuel for manufacturing of good, iron, aluminum, plastic, fertilizer and for transportation. Global warming comes from over burning of fossil. Fossil fuel is fossil of plants, oil is fossil of plankton, coal is fossil of tree, made by CO<sub>2</sub> assimilation from CO<sub>2</sub> and water in 45 billion years. Mankind is now using up these fossil fuel in 500 years. Around half of produced fossil fuel is already used. And remaining estimated amount of buried fossil fuel: oil is 1730 billion tone, 42 years, natural gas is 2760 billion tone, 60 years, coal is 9090 billion tone, 132 years, buried

uranium is 124 years . It is said that oil production reaches maximum in 2037 (earlier in 2026, latest in 2047 and decrease quickly). When fossil is burned out after 500 years, in 2518, no global warming will happen. We must consider how can we live civilized life without fossil. How can we warm up or cool down the room, drive car, air plane, agriculture machine, fishing boat. How can we generate electricity. From what can we make plastic and solar cell module. Fossil fuel is limited very very precious treasure for our mankind. We must consider how to save the limited precious fossil fuel. We should not use precious fossil fuel for the elimination of NO<sub>x</sub>, N,P.

### Conclusion

CO<sub>2</sub> assimilation is promoted by NO<sub>x</sub> and NP. Those country who use NO<sub>x</sub> and NP effectively can produce electricity with low price and can get priority at manufacturing industry and can produce much food and high GDP growth rate. We should stop NO<sub>x</sub> and NP elimination.

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