

# **NO<sub>x</sub> and NP in Waste Water Fix CO<sub>2</sub> and Control Global Warming and Climate**

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## **Abstract**

About 510 billion tone CO<sub>2</sub> is produced by burning of fossil fuel 142 billion tone CO<sub>2</sub> increased in 2017. If we can increase fixing of CO<sub>2</sub> by promotion of CO<sub>2</sub> assimilation, global warming can be protected. To promote CO<sub>2</sub> assimilation, supply of nutrient N and P is essential. About 14 billion tone NO<sub>x</sub> is produced when 140 billion tone fossils is burned. Many developed country are eliminating NO<sub>x</sub> and NP in drainage as pollution substances. 3.75 billion tone NO<sub>x</sub> and 3 billion tone NP in waste water are eliminated. If elimination of NO<sub>x</sub> and NP in waste water are stoped completely, 510 billion tone CO<sub>2</sub> can be fixed and global warming and climate can be controlled.

**Keywords:** NO<sub>x</sub>; NP in waste water; Global warming; CO<sub>2</sub> assimilation; Climate control

## **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>. If we can compensate the generation of CO<sub>2</sub> and heart with the absorption of CO<sub>2</sub> and heart by CO<sub>2</sub> assimilation, global warming can be protected [1-22]. About 510 billion tone CO<sub>2</sub> is produced by burning of fossil fuel and respiration of animal. CO<sub>2</sub> 142 billion tone increased in 2017. To protect global warming, increased 142 billion tone CO<sub>2</sub> must be reduced.

## **NO<sub>x</sub> and NP in Waste Water Fix CO<sub>2</sub> and Control Global Warming and Climate**

About 510 billion tone CO<sub>2</sub> is produced by burning of much fossil and respiration of animals.

About 380 billion tone is fixed by CO<sub>2</sub> assimilation. 142 billion tone CO<sub>2</sub> is remaining to give global warming. 142 billion tone CO<sub>2</sub> must be reduced. Most of CO<sub>2</sub> can be reduced by CO<sub>2</sub> assimilation. We must promote CO<sub>2</sub> assimilation. CO<sub>2</sub> assimilation is promoted by fertilizer. NO<sub>x</sub> and NP in waste water is natural fertilizer [7]. These NP is essential for CO<sub>2</sub> assimilation, production of food. Many official of developed country consider NO<sub>x</sub> and NP in waste water as pollution substance and ignored the importance of NO<sub>x</sub> as a fertilizer. And eliminating NO<sub>x</sub> 3.75 billion tone NO<sub>x</sub> and 3 billion tone NP. Many official of developing country know the importance of NO<sub>x</sub> and NP and using NO<sub>x</sub> and NP as fertilizer and increasing CO<sub>2</sub> assimilation, CO<sub>2</sub> fixing, fish and grain production [11-13,15,18-22].

Global warming is thought to be produced by elimination of NO<sub>x</sub> and NP by developed country.

If elimination of 3.75 billion tones NO<sub>x</sub> and 3 billion tone NP in waste water at developed country are stopped, 167 billion tone CO<sub>2</sub> can be fixed and global warming will be protected.

Responsible amount of reduction of CO<sub>2</sub> is assigned proportionally with the amount of emission of each country [15]. If we can increase fixing of CO<sub>2</sub> by promotion of CO<sub>2</sub> assimilation, global warming will be protected. To promote CO<sub>2</sub> assimilation, supply of nutrient N and P is essential. 14.4 billion tone NO<sub>x</sub> is produced when 140 billion fossil fuel is burned.

CO<sub>2</sub> emission, CO<sub>2</sub> responsible, NO<sub>x</sub> emission, Area, Fixable CO<sub>2</sub>, CO<sub>2</sub> increase, CO<sub>2</sub> fix (CO<sub>2</sub> fixed if NO<sub>x</sub> and NP is used) of 13 country are shown at Table 1.

China emitted 106.4 billion tone CO<sub>2</sub>. CO<sub>2</sub> res is 41.92 billion tone. And emitted 4.26 billion tone NO<sub>x</sub>. China produced 0.815 billion tone fish [13]. China fixed 16.3 billion tone CO<sub>2</sub> by plankton growth. China produced grain 5.57 billion tone. And fixed 11.2 billion tone CO<sub>2</sub>. China has possibility to fix 100 billion tone CO<sub>2</sub> by tree grass CO<sub>2</sub> assimilation at 9.98 m km<sup>2</sup> area. China can fix more than 105 billion ton CO<sub>2</sub> by using 4.26 billion tone NO<sub>x</sub>.  $4.26 \times 25 = 106.5$  billion tone CO<sub>2</sub>.

United State emitted 51.0 billion tone CO<sub>2</sub>. CO<sub>2</sub> res is 20.0 billion tone and emitted 2 billion tone NO<sub>x</sub> and produced 0.055 billion tone fish and fixed 0.1 billion tone CO<sub>2</sub> by plankton growth. United state produced 4.4 billion tone grain and fixed 9 billion tone CO<sub>2</sub>. United state can fix 51 billion tone CO<sub>2</sub> by tree grass CO<sub>2</sub> assimilation at 5.172 m km<sup>2</sup> area. USA can fix more than 50 billion tone CO<sub>2</sub> if they use 2 billion tone NO<sub>x</sub>, USA can fix  $2 \times 25 = 50$  billion tone CO<sub>2</sub> Total  $51 + 50 = 101$  billion tone CO<sub>2</sub>.

India emitted 24 billion tone CO<sub>2</sub>. India fixed 2 billion tone CO<sub>2</sub> by plankton growth for the production of 0.105 billion tone fish. India produced grain 2.96 billion tone and fixed 6 billion tone CO<sub>2</sub>. India can fix 32 billion tone CO<sub>2</sub> by tree grass CO<sub>2</sub> assimilation at 3.287 m km<sup>2</sup> area. India can fix more than 24.5 billion tone CO<sub>2</sub> by using  $0.61 \times 25 = 15.25$  billion tone CO<sub>2</sub>.

Russia produced 19.6 billion tone CO<sub>2</sub> and CO<sub>2</sub> res is 7.72 billion tone. And emitted 0.62 billion tone NO<sub>x</sub>. If NO<sub>x</sub> is used  $0.62 \times 25 = 15.5$  billion tone CO<sub>2</sub> can be fixed.

Japan produced 12.5 billion tone CO<sub>2</sub>. CO<sub>2</sub> res is 4.92 billion tone and emitted 0.5 billion tone NO<sub>x</sub>. Japan produced 0,047 billion tone fish and fixed 0.94 billion tone CO<sub>2</sub> by

plankton growth. Japan produced 0.1 billion grain and fixed 0.24 billion tone CO<sub>2</sub>. Japan can fix 3.3 billion tone CO<sub>2</sub> by tree grass assimilation at 0.378 m km<sup>2</sup> area.

Total  $0.94 + 0.24 + 3.3 = 4.48$  billion tone CO<sub>2</sub> can be fixed. But Japan cannot fix  $12.5 - 4.48 = 8.02$  billion tone CO<sub>2</sub> at his own land. Because area is narrow Japan increasing 8.02 billion tone CO<sub>2</sub>. Japan must fix CO<sub>2</sub> at surrounding sea by plankton CO<sub>2</sub> assimilation by using 0.5 billion tone NO<sub>x</sub>.  $0.5 \times 26 = 12.5$  billion tone CO<sub>2</sub> can be fixed Officials of Japan consider that NO<sub>x</sub> and NP in waste water are pollution compounds and eliminating NO<sub>x</sub> and NP completely. Therefore CO<sub>2</sub> assimilation is retarded. Japan producing 1 billion tone CO<sub>2</sub> for the elimination of NO<sub>x</sub> and producing 1 billion tone CO<sub>2</sub> for the elimination of NP in waste water. Japan setting solar cell for electricity generation. This system requires much CO<sub>2</sub> generation for the cell and set up place. Heat absorption efficiency of solar cell is half of tree leaf. Therefore solar cell construction is promoting global warming. Solar cell electricity generation by the scarify of wood should be stopped. If Japan stop NP elimination, Japan can fix another 3 billion tone CO<sub>2</sub>.

Germany increasing 4.3 billion tone CO<sub>2</sub>. If Germany use 0.31 billion tone NO<sub>x</sub> for CO<sub>2</sub> assimilation,  $0.31 \times 25 = 7.75$  billion tone CO<sub>2</sub> can be fixed.

United Kingdom produced 4 billion CO<sub>2</sub>. United Kingdom can fix 0.1 billion tone CO<sub>2</sub> by plankton, 0.4 billion tone CO<sub>2</sub> by grain production, and 2.4 billion tone CO<sub>2</sub> by grass tree production. Total 2.9 billion tone CO<sub>2</sub> can be fixed. United Kingdom increasing 1.1 billion tone CO<sub>2</sub> If United Kingdom use 0.15 billion tone NO<sub>x</sub> for CO<sub>2</sub> assimilation, 3.75 billion tone CO<sub>2</sub> can be fixed.

Italy produced 3.5 billion CO<sub>2</sub>. Italy can fix 0.7 billion tone CO<sub>2</sub> by plankton, 0.3 billion tone CO<sub>2</sub> by grain production, and 0.3 billion tone CO<sub>2</sub> by tree grass production. Total 1.3 billion tone CO<sub>2</sub> can be fixed. Italy increasing 2.2 billion tone CO<sub>2</sub> If Italy use 0.14 billion tone NO<sub>x</sub> for CO<sub>2</sub> assimilation, 3.5 million tone CO<sub>2</sub> can be fixed.

Japan, United Kingdom and Italy cannot fix CO<sub>2</sub> at his country Because areas are narrow. Japan emitted  $1.2 \times 10^9$  tone CO<sub>2</sub> in 2015. Japan has area  $3.8 \times 10^5$  km<sup>2</sup>. Fixable CO<sub>2</sub> is  $3.3 \times 10^8$  tones.

Japan increasing  $9 \times 10^8$  k tone CO<sub>2</sub>. Japan, United Kingdom and Italy are increasing CO<sub>2</sub>. These 3 countries are surrounded by sea. These countries can decrease CO<sub>2</sub>

by plankton CO<sub>2</sub> assimilation at sea. Total CO<sub>2</sub> emission of the world is 5.1 x 10<sup>10</sup> t. We must decrease CO<sub>2</sub> emission

by the promotion of plankton CO<sub>2</sub> assimilation by using NO<sub>x</sub>. As shown at next Table 1.

| Country   | CO <sub>2</sub> em | CO <sub>2</sub> res | NO <sub>x</sub> | Area                  | Fixable CO <sub>2</sub> | CO <sub>2</sub> in | CO <sub>2</sub> fix |
|-----------|--------------------|---------------------|-----------------|-----------------------|-------------------------|--------------------|---------------------|
| World     | 510                | 142                 | 14.4            |                       |                         | 142                | 510                 |
| China     | 106.4              | 41,9                | 4.25            | 1.0x 10 <sup>7</sup>  | 100                     | 0                  | 140                 |
| USA       | 51                 | 20                  | 2               | 9.5x 10 <sup>6</sup>  | 101                     | 0                  | 101                 |
| India     | 24.6               | 9.69                | 1               | 3.2x10 <sup>6</sup>   | 32                      | 0                  | 42                  |
| Russia    | 19.6               | 7.72                | 0.63            | 3.2x10 <sup>6</sup>   | 32                      | 0                  | 32                  |
| Japan     | 12.5               | 4.92                | 0.5             | 3.8 x10 <sup>5</sup>  | 33                      | 9.2                | 15.5                |
| Germany   | 7.8                | 2,95                | 0.31            | 3.5x 10 <sup>5</sup>  | 3.5                     | 4.3                | 10.75               |
| Iran      | 6.3                | 2.48                | 0.25            | 1.6x10 <sup>6</sup>   | 0.16                    | 6.3                | 5.75                |
| Canada    | 5.6                | 2.24                | 0.22            | 1.0x 10 <sup>8</sup>  | 100                     | -30                | 30                  |
| Indonesia | 5                  | 1.99                | 0.2             | 1.9x 10 <sup>6</sup>  | 10                      | -10                | 10                  |
| U. K      | 4                  | 1.58                | 0.16            | 2.4 x 10 <sup>4</sup> | 2.4                     | 1.6                | 7                   |
| Turkey    | 4                  | 1.58                | 0.16            | 7.8x 10 <sup>5</sup>  | 0.78                    | 3.2                | 4                   |
| Italy     | 3.5                | 1.38                | 0.14            | 2.0x 10 <sup>5</sup>  | 3                       | 0.5                | 5                   |
| France    | 3.3                | 1.37                | 0.13            | 6.4x 10 <sup>5</sup>  | 8.4                     | 0                  | 5                   |

Table 1: CO<sub>2</sub> emission, CO<sub>2</sub> responsible NO<sub>x</sub> emission, Area, \_Fixable CO<sub>2</sub>, CO<sub>2</sub> increase, CO<sub>2</sub> fix (CO<sub>2</sub> fix if NO<sub>x</sub> and NP is used completely) of 13 country.

If USA stop elimination of 2 billionth NO<sub>x</sub>, If Japan stop elimination of 0.5 billion tone NO<sub>x</sub>, if Germany stop elimination of 0.32 billion tone NO<sub>x</sub>, if Iran stop elimination of 0.25 billion tone NO<sub>x</sub>, if Canada stop elimination of 0.22 billion tone NO<sub>x</sub>, if UK stop elimination of 0.16 billion tone NO<sub>x</sub> elimination, if Italy stop elimination of 0.14 billion tone NO<sub>x</sub> elimination, if France stop elimination of 0.13 billion tone NO<sub>x</sub> elimination, Total 3.71 billion tone NO<sub>x</sub> can fix 3.71x25= 92,75 billion tone CO<sub>2</sub>. If USA, Japan, Germany, Iran, Canada, UK, Italy, and France stop 3 billion tone NP in waste water elimination, 3x 25=75 billion tone CO<sub>2</sub> can be fixed. Total 92.75+ 75=167 billion tone CO<sub>2</sub> can be fixed. This amount is almost same as increased 142 billion tone CO<sub>2</sub>.

## Summary

CO<sub>2</sub> assimilation must be promoted by stopping of NO<sub>x</sub> elimination and by stopping waste water elimination. By stopping NO<sub>x</sub> elimination. 14.4 billion tone NO<sub>x</sub> can fix 14.4x 25= 360 billion tone CO<sub>2</sub>. Amount of N.P in drainage is around 6 billion tone. By using this 6 billion tone N.P, we can fix 6x 25= 150 billion tone CO<sub>2</sub>. Total 360+150=510 billion tone CO<sub>2</sub> can be fixed and 15 x 10<sup>15</sup> kcal can be absorbed to control global warming and climate.

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