Should Developing the Foundation for Alleviating Global Warming through Iron-Fertilization of Southern Oceans be Debated at ICEF-2?

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The press of the wealthier countries covers the CO₂ emission-caused global warming and most of the political leaders of the richer countries advocate remedying its causes. However, in my interactions with friends, neighbors and academics, including students at leading universities, I have met very few who know the basics of Professor Kaya’s teachings. Fewer than 1 % of those whom I have met, including Engineering Students at Tokyo University, are aware of the simple fact that the primary cause of the rising atmospheric CO₂ concentration is the global, rapid and accelerating increase in personal and public wealth. Many know that global warming is that the problem compounded its secondary, lesser, cause, which is population growth. So far the decrease in carbon intensity does not appear to suggest that it will neutralize the effect of growth in GDP. (Figure 1)

Figure 1: The world’s real GDP, population and energy consumption per unit of real GDP changes.

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The public has not been told by the Press that reduction of CO\(_2\) emissions through energy conservation and switching from fossil fuels to renewables is massively outpaced by the global rise in CO\(_2\) emissions associated with the increase in global per capita GDP. The Press, the political leaders and the public do not internalize the fact as the wealth of people grows, they live and work in more spacious and better temperature-controlled environments, drive more cars, fly longer distances, use more steel and cement and consume more manufactured goods. So far there is little to suggest that human behavior is changing rapidly enough to abate the rise in global CO\(_2\) emissions (Figure 2), in the number of CO\(_2\) grams emitted per kWh (Figure 3), or in the global liquid fuels consumption (Figure 4). The messages of the Press and the political leaders, that the problem of global warming can be addressed by conserving energy and by switching from fossil to renewable sources of primary energy, have as yet no factual basis. Technological progress in energy conservation, biofuels, switching to renewable energy and CO\(_2\) capture and burial is nowhere near balancing the global real GDP-growth associated increase in CO\(_2\) emissions: the decrease in energy consumption per unit GDP is far from sufficient to avoid the persistent and rapid rise in the atmospheric CO\(_2\) level resulting of the real global GDP-growth. I see the growing gap as resulting of human nature: people, poor or rich, seek wealth.

Never have I seen a television program expressing Professor Kaya’s teaching that wealth and global warming are associated, nor have I read in an influential newspaper an article so-stating. While President Obama of the USA has advocated in each of his annual State of the Union addresses to Congress the combating of global warming, he has been mute on associating the warming with the increases in global wealth and population. The Green Movements of the richer countries, their Press and their political leaders, presently the only ones considering the addressing of global warming as being of high priority for humanity, wishfully attribute global warming to insufficient energy conservation and inadequate use of renewable energy, not to the global growth in wealth. However, humans being humans, pursue their interests; in the poorer parts of the world people care about food, shelter, education, and physical safety; their living environment is of lesser priority and the abatement of global warming is near the bottom of their priorities. In the richer parts of the world, people wish others to drive smaller cars, wish others to live and work in less heated and cooled spaces, wish others to consume fewer goods, wish other to build fewer home and wish others to replace their cars less frequently—just cement and steel accounting for 13 % of all emitted CO\(_2\).
Recalling the 20th century’s failed attempts by political leaders to change the nature of people, e.g. through Stalinist-Leninist communism or through re-education in the Cultural Revolution, it just might not be possible to re-make humans to conform to the Green Ideals.

![Figure 2](image1.png)

**Figure 2**: Global CO2 emissions from fossil fuel burning and cement production, gigatons carbon per year.

![Figure 3](image2.png)

**Figure 3**: CO₂ grams emitted per kWh.

![Figure 4](image3.png)

**Figure 4**: Global liquid fuels consumption 2008-2014.

Accepting that the nature of humans can’t be re-engineered and that people will continue to strive to increase their wealth and to have large families, how can humanity avoid the
catastrophic consequences of global warming? Is it time for the Press and for the political leaders to inform the public that a non-Green, biodiversity-damaging option exists? Is it time to publicize and debate this option? The public in the wealthier countries, constituting presently the only audience for the warnings about the consequences of global warming, is led by the Press and political leaders to wrongly assume, in spite of the trends of Figures 1-4, that the catastrophic consequences of global warming will be avoided by utilizing available, but underutilized renewable energy and more conservation. This is so because the mitigation of global warming has been adopted and owned by the world’s Environmental Movements. A doctrine of these Movements is that humanity must not further endanger animal and plant species through perturbing animal or plant habitats. The doctrine clashes with combating catastrophic global warming by iron fertilization of Southern Oceans, suggested by the late John H. Martin as the cause of the latest ice-age. His suggestion, that has been doubted and challenged by many, has been recently validated. In a sediment core from the Subantarctic Atlantic, A. Martínez-García et al. recently measured foraminifera-bound nitrogen isotopes to reconstruct ice age nitrate consumption, burial fluxes of iron, and proxies for productivity. (“Iron Fertilization of the Subantarctic Ocean During the Last Ice Age” Science, 343, 21 March 2014, pp. 1347-1350) Peak glacial times and millennial cold events were characterized by increases in dust flux, productivity, and the degree of nitrate consumption; this combination has been found uniquely consistent with Subantarctic iron fertilization. The associated strengthening of the Southern Ocean’s biological pump explains the lowering of CO$_2$ at the transition from mid-climate states to full ice age conditions as well as the millennial-scale CO$_2$ oscillations.

That iron fertilization of oceans clashes with core ideals of the Green Movements is most evident from The Convention on Biological Diversity (COP 9; Decision IX/16 Biodiversity and Climate Change, Section C, Ocean Fertilization), which has aimed to suppress the Ocean Fertilization option, thus far successfully, by applying rules of the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

ICEF-1 has respected, indeed conformed to, ideals of the Environmental Movements and was correspondingly mute on iron fertilization of Southern Oceans. Should the iron fertilization option be debated in a dedicated Session at ICEF-2? Because ocean fertilization alters the distribution of marine organisms including marine animals, creating new habitats and damaging
others, it will antagonize the world’s Environmental Movements. If Ocean Fertilization is added to the Agenda of ICEF-2, METI, and through METI Prime Minister Shinzo Abe, are likely to be painted by the Environmental Movements as being anti-Green and as hostile to the conservation of marine species. Yet some, including myself, would see Prime Minister Abe and METI as visionary leaders, willing to face the sad reality that people, rich and poor, seek wealth, and that attempts to alter human nature have failed in the past.