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The impact of Human intelligence on the global carbon cycle
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Rosing Minik T.[1*]
Minik T. Rosing[1*]

[1] ミニック T. ロジング
[1]Rosing, M.T.

The human brain consumes about one fourth of the total energy spent by the human body or ˜25 W. For the present human population this leads to an average global energy consumption of ˜0.4 mW/m2 for the collective human brain activity. However, Human thought has far greater consequences than the direct metabolic activity of the brain. The idea of thermodynamics has allowed humans to spend more energy than we can obtain through our own metabolism. We have overcome the constraints of maximum appropriation of the primary photosynthetic productivity.

On a global scale, photosynthetic organisms capture solar energy equivalent to about 250 mW/m2 of Earth's surface 1. About 1 per mil of this is deposited in sediments and either returned to the mantle via subduction on relatively short geologic timescales or sequestered in the crust on long geologic timescales. The thermodynamic insights have allowed us to convert the stored photosynthetic energy to wok and heat at a rate of ˜30 mW/m2 ref 2. This is equivalent to 1/3 of Earth total inner energy conversion expressed in volcanism, plate tectonics and geothermal heat, and 20 times greater than the physiological energy conversion of humankind. By analyzing the impact of human thought relative to the energy requirement of our physiology we can evaluate the impact of societal structure and culture on the global carbon cycle.

1. Field, C. B., Behrenfeld, M. J., Randerson, J. T. & Falkowski, P. Primary production of the biosphere: Integrating terrestrial and oceanic components. Science 281, 237-240 (1998).

2. Doman, L. E. in DOE/EIA-0484(2010) (ed U.S. Energy Information Administration) 9-21 (U.S. Energy Information Administration, Washington, DC, 2010).

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