

## Review: CO<sub>2</sub> Rising: The World's Greatest Environmental Challenge

By Tyler Volk

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Volk, Tyler. *CO<sub>2</sub> Rising: The World's Greatest Environmental Challenge*. Cambridge, MA: The MIT Press, 2008. xvi, 223 pp. ISBN 9780262220835. US\$22.95, cloth.

Our survival is dependent on greenhouse gases, yet CO<sub>2</sub> (carbon dioxide), the most common greenhouse gas, is threatening our very survival. The greenhouse effect, derived from CO<sub>2</sub> and water vapor feedback, warms the Earth's surface. This warmth is essential to life and without it all would be frozen. Yet, too much concentration of CO<sub>2</sub> leads to global warming and its consequences. Since the early 1960s, CO<sub>2</sub> concentration in the atmosphere has increased about 20 percent. It is not cleansed by the atmosphere, though nature vacuums up about half our waste emissions. CO<sub>2</sub> is rising everywhere at about the same rate, and the atmosphere's mixing makes CO<sub>2</sub> additions affect all places equally. From 1966-2005, CO<sub>2</sub> in the air increased by 61 ppm (parts per million), or 130 billion tons.

Volk cleverly introduces carbon cycling by following individual carbon atoms that are each given a name. There is Dave, a molecule of calcium carbonate that entered the biosphere from the dissolution of a limestone cliff; Coalleen, dug up as part of a chunk of black coal; Oiliver, pumped from below ground in a giant oilfield, transformed, and sent out a tailpipe; Methaniel, part of a molecule of methane in the flow of natural gas; and Icille, another molecule of calcium carbonate. Each tells their own story from their own point of view, covering up to 32,000 years. It's a wonderful way for interested laypersons and students to learn about CO<sub>2</sub>'s role in global warming.

Volk uses data from the observatory at Mauna Loa, Hawaii covering from 1960 to 2008 as well as other data, especially that gathered from Antarctica. Using ice cores removed from giant mounds of ice from the Law Dome, covering the period from 1000 to 1969, and the Taylor Dome, covering the past 12,000 years, show that the atmosphere had a concentration of CO<sub>2</sub> of about 280 ppm. Further studies have shown that the 280 ppm figure holds true during the previous warm periods extending back as far as 650,000 years. This is notably below the 385 ppm of CO<sub>2</sub> found in the atmosphere today. Starting about 1850, fossil fuel combustion contributed to the atmosphere increasing amounts that now equal approximately 40 percent more CO<sub>2</sub>. Volk does convince that our greatest environmental challenge is the increasing CO<sub>2</sub> levels in our atmosphere. He proposes solutions to the carbon emissions problem as well in the chapter, "Reining in the CO<sub>2</sub> Increase": for example, that the U. S. should establish the goal of becoming an even wealthier society but with substantially reduced CO<sub>2</sub> emissions.

While Volk has made a complicated subject more understandable, the multitude of facts and details in the text may prove challenging to some general readers. Likely they would do better with Al Gore's *An Inconvenient Truth*. Those students and others with an interest in the subject will come away with a better understanding of the threat of carbon emissions. The numerous charts, graphs, and illustrations will assist readers in visualizing the points being made. *CO<sub>2</sub> Rising* would be a welcome supplementary text for any course covering global emissions. Included are notes and an index. Highly recommended for all academic and research collections.

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