First Place - 2010 SACP High School Essay

SULFUR DIOXIDE: TOMORROW'S SOLUTION, TODAY

Global warming, the increase in temperature of the earth's surface, is past the point of debate regarding its existence or cause. However, simply changing one's lightbulbs to fluorescent will not put a dent in the problem, nor will limiting the emissions of carbon dioxide and the other greenhouse gases. Because of the relatively long atmospheric lifespan of anthropogenic CO_2, 1,000 years, the effects of the proposed reduced emissions will only curb pollution rather than address the actual climate change (Archer 2). A more drastic measure is called for, one that is cheap, practical, and efficient.

Over 400,000,000 metric tons of sulfur dioxide are released each year throughout the world from both human and natural activity (Levitt 192). If just a fraction of this gas, roughly .5%, was released into the stratosphere as opposed to the troposphere, where most emissions currently remain, it could reverse the effects of global warming (Levitt 190, 192). Using a "hose" several miles in length and several pumps along the way, one could pump the excess SO_2, into the stratosphere. Once there, it would reverse the effects of global warming via enhancing planetary albedo and acting as cloud condensation nuclei (Crutzen 1). Unlike other proposed solutions, SO_2 could have an effect in just one year, an essential criterion in a situation where time is of the essence (Crutzen 13).

Opponents of this "global blanket" argue that the sulfur dioxide will cause acid rain. However, due to the difference in nature between stratospheric SO_2 and tropospheric SO_2, the gas would be significantly more effective and thus substantially less would be necessary (Crutzen 2). In addition, it would also remain in the atmosphere for up to two years, as opposed to traditional sulfur dioxide emissions which return to earth after a few weeks (Crutzen 2). Skeptics can find proof of SO2's cooling effects in the eruption of Mount Pinatubo in 19991, when volcanic particles caused a sustained drop in global temperature (Crutzen 2,3). If the SO_2 proves too effective, the flow can be shut off immediately and should return to previous conditions within a few years (Levitt 195). The risks of SO_2 may seem high and unfamiliar, but idleness itself is the true danger.

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