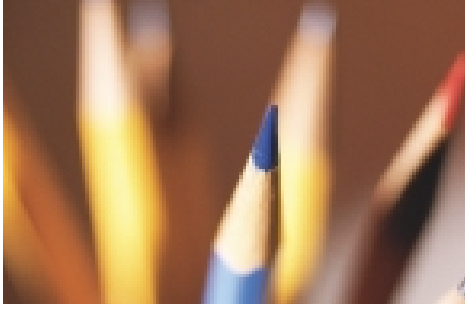

Greenhouse Gases: A Hazy Outlook

Heated discussions about global climate change have been taking place for years. But, in recent months, this topic has received a great deal of attention as a result of President Bush's announcement that he will not honor the 1997 Kyoto Protocol requirements that were accepted by the Clinton Administration (*CEP*, January, p. 25). The goal of the Kyoto Protocol is to reduce the emissions of six greenhouse gases (GHGs), including carbon dioxide (CO_2), by an average of 5% below the 1990 levels during a 5-year period beginning in 2008. For the U.S., this would mean capping emissions during this period at 7% below 1990 levels.

One bone of contention is that many underdeveloped nations, such as China and India, have declined to sign the treaty, making it questionable what the environmental impact will be for treaty-signing countries. In our March issue (p. 8), one *CEP* reader wrote, "The Protocol has absolutely no benefits for our country ... because it does not require developing nations to do anything to curtail their GHG emissions. Meanwhile, any smokestacks that the Protocol moves from the U.S. to most developing nations will have no pollution controls."

Additionally, there is concern about the Protocol's effects on the U.S. economy. According to the financial- and economic-analysis firm WEFA (now DRI-WEFA, based in Eddystone, PA), the impact may be severe. Some conclusions reached by the firm's 1998 study include: nearly doubling energy and electricity prices, while raising gasoline prices by an additional $0.65/gal; annually reducing the U.S. total output by $300 billion and cutting 2.4 million U.S. jobs; and reducing the average household income by about $2,700. WEFA is not alone in its conclusions. The Energy Information Administration (EIA) also notes that the Protocol may cost as much as $1,500 per person, or $4,100 for most families, on an annual basis.

However, proponents of the Protocol contend that GHG reductions are economically feasible, provided that the right policies, technologies, and incentives are in place. In a recent press release, Michael Zammit Cutajar, executive secretary of the UN Climate Change Convention, said "I am convinced that the turnaround in global emissions can be achieved over time through cost-effective policies and 21st century technologies that will benefit economic growth and sustainable development. Developed countries must take a lead in demonstrating these opportunities."

Setting politics aside, companies, including those in the chemical process industries, should still be proactive in reducing GHG emissions. I believe that this is already the case. In late 2000, BP, Shell International, Suncor Energy, Ontario Power Generation, Alcan, and Pechiney, along with the Environmental Defense Fund, established the Partnership for Climate Action. Its objective is to champion market-based mechanisms as means for achieving early and credible action on GHG emissions that are efficient and cost-effective. Each company has already set a target for GHG emissions reductions that will result in an annual cut of at least 80 million metric tons of CO_2 equivalent by 2010.

A great deal of emphasis has been placed on the research and development of alternative energy sources. Currently, a hotbed of activity is the area fuel cells, which use hydrogen as their source of energy. Just this past May, Ford Motor Co. publicly outlined its plans to cut CO_2, with one of the solutions being a line of fuel-cell vehicles, which is expected to be on the road by the end of next year. And in our May issue (p. 16) we noted that Hydro Environmental Resources is developing a novel fuel cell that will be used to supply energy to Orini Lumber Processors in New Zealand.

Carbon sequestration — the uptake of CO_2 in biomass, soil, and oceans — is another potentially effective solution for reducing GHG emissions. On page 44, Robert L. Kane, Global Climate Change Manager at the Department of Energy, and Daniel E. Klein from Twenty-First Strategies, outline the progress that is being made in this area. They discuss projects involving terrestrial sequestration, technologies for capturing CO_2 from flue gases, geologic sequestration, ocean sequestration, and chemical and biological fixation and reuse.

While such projects hold great promise, these solutions are still not economically viable. According to Kane and Klein, "Present technologies for carbon capture are not currently affordable, entail high-energy penalties, and are limited in scope. To be viable, carbon sequestration will need to be less expensive, more efficient, and have a higher capacity." Only time will tell whether or not these solutions make sense.

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