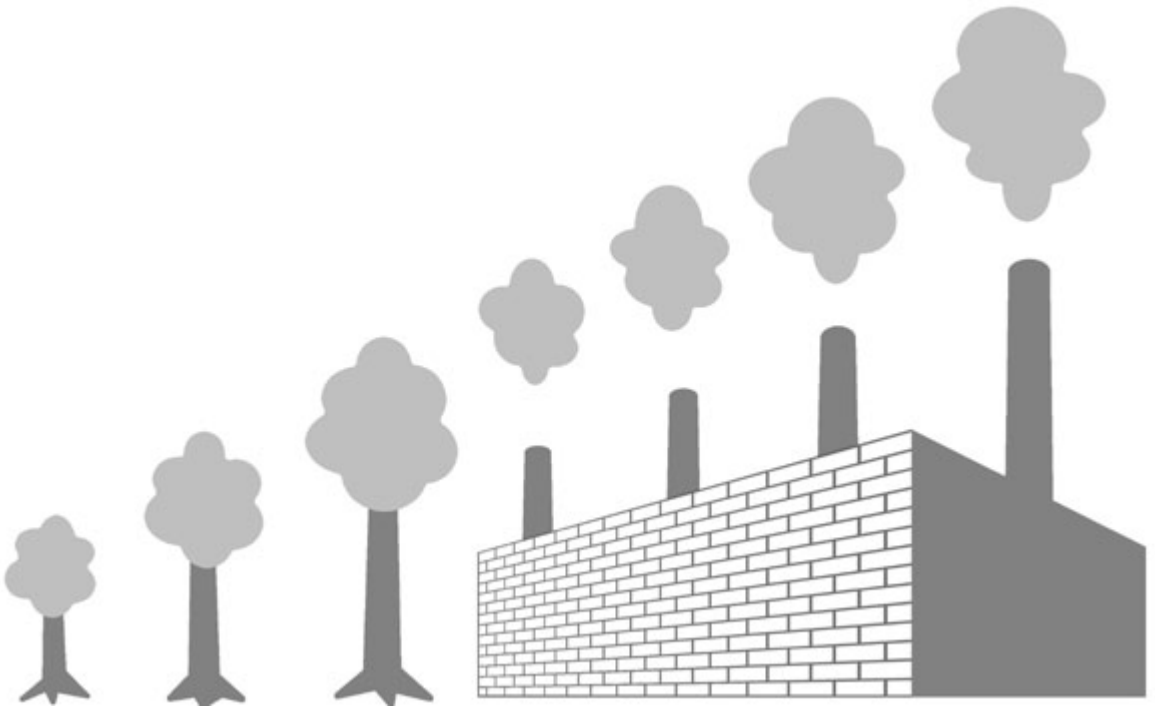
OP-ED CONTRIBUTOR

When Being Green Raises the Heat



Stephen Savage

By KEN CALDEIRA
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Readers' Opinions

Forum: The Environment

CARBON DIOXIDE is heating up the Earth. Ice caps are melting, ocean levels are rising, hurricanes are intensifying, tropical diseases are spreading and the threat of droughts,

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floods and famines looms large. Can planting a tree help stop all this from happening?

To some, it's a no-brainer: We add carbon dioxide to the atmosphere every time we use energy from coal, oil or gas; but each tree can remove more than a ton of carbon dioxide from the atmosphere over its lifetime. Based on this logic, it might seem a good idea to go out and plant a tree to slow global heating.

And if you don't have the time, projects have sprung up throughout the world claiming to help cool the earth, ready to accept your money and plant a tree in your name. The computer company Dell will now donate $2 from every laptop sale to planting trees in an effort to offset the carbon dioxide emissions that result from powering their computers. For a 2 percent to 4 percent surcharge on bills, Pacific Gas and Electric will offer to offset its customers' carbon emissions by helping to preserve California's carbon-storing forests.

While preserving and restoring forests is unquestionably good for the natural environment, new scientific studies are concluding that preservation and restoration of forests outside the tropics will do little or nothing to help slow climate change. And some projects intended to slow the heating of the planet may be accelerating it instead.

Trees don't just absorb carbon dioxide — they soak up the sun's heating rays, too. Forests tend to be darker than farms and pastures and therefore tend to absorb more sunlight. This has a warming influence that appears to cancel, on average, the cooling influence of the forest's carbon storage. This effect is most pronounced in snowy areas — snow on bare ground reflects far more sunlight back to space than does a snowed-in forest — so forests in areas with seasonal snow cover can be strongly warming.

In contrast, tropical forests appear to be doubly valuable to the earth's climate system. Not only do they store copious amounts of carbon, the roots of tropical trees reach down deep, drawing up water that they evaporate through their leaves. In the atmosphere, this water may form clouds that reflect sunlight back to space, helping to cool the earth.

These findings have important policy implications. It has been suggested that agreements to limit climate change should consider carbon stored in forests. If so, they would need to consider the direct climate effects of forests so as to avoid perverse incentives to plant warming forests in places like the United States, Canada, Europe and the former Soviet Union. However, tropical forests, which are generally found in developing countries, may be due a double climate credit — one for their carbon storage and another for their cooling clouds.

What does this mean for local reforestation efforts? Consider Pacific Gas and Electric's surcharge plan. While the carbon soaked up by California's forests reduces atmospheric carbon dioxide concentrations everywhere, cooling Crete, Cancún and Calcutta, the sunlight they absorb warms the state and the surrounding region. So, it might even cool us if we were to cut down those dark forests. Lumber interests might look gleefully upon the prospect.

Clear-cutting mountains to slow climate change is, of course, nuts. The broadest goal is neither to slow the growth of carbon dioxide in the atmosphere nor to slow climate change, but rather to preserve the irreplaceable natural balance that sustains life as we know it on this planet. We want to avoid climate change so that we might pass these diverse natural riches on to future generations. In this light, preserving and restoring forests is a valuable activity, regardless of its impact on climate — we need more trees, not fewer.

But the notion that we can save the planet just by planting trees is a dangerous illusion. To preserve our environment, we must drastically reduce carbon dioxide emissions, and this will require a major transformation of our energy system. A primary goal for the next half-century should be to transform our energy system to one based on clean, safe and environmentally acceptable energy sources like wind, solar and perhaps nuclear. This means solving the real problems involved with storing and distributing power, providing energy for transportation, and using nuclear plants.

We cannot afford to indulge ourselves with well-intentioned activities that do little to solve the underlying problem. Instead, we must demand that our political leaders do more to revolutionize our energy system and preserve our environmental inheritance for future generations.

And then we can plant a tree.

Ken Caldeira is a scientist at the Carnegie Institution's department of global ecology.

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