

Study sees potential for acceleration in U.S. emissions

November 13 2007

U.S. greenhouse gas emissions could grow more quickly in the next 50 years than in the previous half-century, even with technological advances and current energy-saving efforts, according to a new study by MIT's Richard Eckaus, the Ford International Professor of Economics, emeritus, and his co-author, Ian Sue Wing (Ph.D. 2001).

What's more, technology itself may be more the stuff that dreams are made on than the most available tool for reducing CO₂ emissions or solving the global energy crisis, cautions Eckaus.

"There is no a priori reason to think technology has the potential for reducing energy use while meeting the tests of economics. It's politically unappetizing in the U.S., but in Europe, gas costs six dollars a gallon. Make energy more expensive: People will use less of it," Eckaus says.

In their paper, "The Implications of the Historical Decline in U.S. Energy Intensity for Long-Run CO₂ Emission Projections," published in the November issue of *Energy Policy*, Eckaus and Wing portray the changing interplay among technology, energy use and CO₂ emissions, based on a simulation of the U.S. economy.

"We found that, in spite of increasing energy prices, technological change has not been responsible for much reduction in energy use, and that it may have had the reverse effect," Eckaus says of their results.

The researchers studied the periods 1958 to 1996 and 1980 to 1996 and

projected from 2000 to 2050. Based on their findings from the past 50 years and adjusted for a more realistic expectation for technological changes, they found that the rates of growth for energy use and emissions may accelerate from the historical rates of 2.2 percent and 1.6 percent, respectively.

"The rates of growth could be higher by a half percent or more, which becomes significant when compounded over fifty years," Eckaus says.

He acknowledges it has become counterintuitive to question technology's potential to solve the energy problem. But U.S. steelmaking illustrates how fossil fuel consumption can increase along with technological change: Steelmakers' furnaces are now electrical, reducing coal use at the plant. But coal generates some of the electricity that powers the factory furnace, resulting in more CO₂ emissions.

"The net savings in this case comes from the use of scrap steel instead of iron ore, not from new furnace technology," Eckaus says.

A former consultant to the World Bank, Eckaus has been an advisor on economic policy to Egypt, India, Mexico and Portugal, among other countries; he advocates policies to control both energy use and CO₂ emissions.

"Technological change will not necessarily reduce dependence on fossil fuels. Energy taxes or a system of caps on energy use and trade in emissions permits are necessary," he says.

In a new paper on a related topic, "Unemployment Effects of Climate Policy," (PDF) Eckaus and co-author Mustafa H. Babiker of Aramco model the negative effects on labor employment of policies to limit greenhouse gas emissions. They then propose economic policies to counteract these effects.

"Climate change is a social and economic problem. If society wants to do something about it, it will have to bear the cost. It won't be free. It's an unprecedented social problem that requires a social response," Eckaus says.

According to Eckaus and Babiker, emissions restrictions policies generate the social problem of unemployment by reducing the demand in some industries for workers. The lowered output, in turn, would lead to reductions in the GNP by as much as 4 percent in the coming decades--a depressing effect on the U.S.

"If there were two policies, instead of just one--a counteracting labor market policy, as well as the emissions restrictions--the negative direct economic effects could be completely eliminated," they write.

In conversation, Eckaus suggests a labor market policy--a wage subsidy such as reduced labor taxes--to aid workers displaced from such industries as petroleum refining, automobile-making, metal fabricating and some chemical industries.

"Most studies assume labor and wages will adjust; some assume these will adjust quickly. But our study shows unemployment will go up, and adjustments won't necessarily follow quickly. We need an economic policy to address that," he says.

"We might expand and subsidize public transportation systems. We could launch a transportation-stamp program, to operate like food stamps: 'Get a stamp and get on a bus!'" he says.

Eckaus, Babiker and Wing are affiliated with the MIT Joint Program on the Science and Policy of Climate Change.

Source: MIT

Citation: Study sees potential for acceleration in U.S. emissions (2007, November 13) retrieved 18 April 2024 from <https://phys.org/news/2007-11-potential-emissions.html>

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