

# AC demand in developing countries could put chill on energy supply

August 13 2013

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The United States uses more energy for air conditioning than all other countries combined, but its status as the world's largest AC energy hog

may soon be in jeopardy, said a University of Michigan researcher.

A new study by Michael Sivak, research professor and director of Sustainable Worldwide Transportation at the U-M Transportation Research Institute, shows that if the rest of the world adopts the same AC usage patterns found in the U.S.—and more and more countries certainly are—eight nations have the potential to surpass the American yardstick of high [air-conditioning](#) use.

"Several developing countries rank among both the most populous and hottest areas in the world," Sivak said. "As personal incomes rise in these countries, use of air conditioning will likely go up, leading to an unprecedented increase in [energy demand](#). Rapid increases in the ownership of air conditioners are already occurring in many developing countries."

Sivak's study, appearing in American Scientist, examined the local climate and size of population for 170 countries around the world. He used a measure known as cooling-degree days, which provides an index of the energy demand required to cool indoor spaces. One cooling-degree day occurs for each degree the average daily [outdoor temperature](#) is above 65 degrees Fahrenheit.

Sivak found that [energy usage](#) in India, China, Indonesia, Nigeria, Pakistan, Bangladesh, Brazil and the Philippines would exceed the demand in the U.S. if air conditioning became as prevalent in these countries as it is here. He also said that current cooling demands in these countries and many [developing nations](#) are nowhere near their possible peaks.

The top three—India, China and Indonesia—could surpass the U.S. by factors of 14, 5 and 3, respectively, if they adopt American standards of cooling, Sivak said. And future demand in all countries of the world has

the potential to exceed demand in the U.S. by a factor of 50.

"As nations become more affluent and more people around the world adopt air conditioning, the energy demands in developing [countries](#) are certain to increase," Sivak said. "At the same time, climate change is expected to make cooling demands even greater than they are today. This trend will put additional strain not only on global energy resources but also on the environmental prospects of a warming planet."

Provided by University of Michigan

Citation: AC demand in developing countries could put chill on energy supply (2013, August 13) retrieved 9 April 2024 from

<https://phys.org/news/2013-08-ac-demand-countries-chill-energy.html>

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