

Does saving energy save the climate?

December 17 2018

To stop climate change, saving energy matters less than switching to renewable energy. Indeed, says Anthony Patt, it isn't clear whether saving energy makes much of a difference at all.

During the summer heat wave of 2018, the Swiss media reported that the elderly in particular were suffering. In order to achieve climate policy goals, it was impossible to turn on air conditioning in Zürich homes for the elderly. Reducing energy consumption is good. But does climate protection demand that people suffer, especially the elderly, when temperatures rise?

The standard answer seems to be yes. The logic is simple: most of the energy people use comes from [fossil fuels](#), which are the main cause of climate change. So it would seem logical that people need to use less energy.

But there is an important omission in this logic. It stems from the fact that to stop climate change, we need not just to reduce our CO₂ emissions, but rather to eliminate them entirely. Once none of our energy comes from fossil fuels, then energy use will be irrelevant.

Of course this isn't the entire story either. It will take time before we can switch to entirely [renewable energy](#), across all sectors of the economy. So there are two more important questions worth investigating:

First, does the energy we save during this period of transition to purely renewable energy make much of a difference?

Second, will efforts to conserve energy also accelerate the shift to renewable energy, or could they even slow this shift down?

A drop in the ocean

We recently examined the first of these questions. The short answer: saving energy makes almost no difference. To meet the targets that scientists and policy-makers have set – limiting climate change to less than 2°C total warming – we need to eliminate emissions in the next 20 to 30 years. The exact deadline for going fossil-free depends on a number of uncertain factors, most importantly whether we believe it will be possible to actively remove CO₂ from the atmosphere in the second half of the century.

The climate turns out to be remarkably insensitive, however, to changes in [energy efficiency](#). Under one set of assumptions, which includes current trends in improving energy efficiency, the deadline to go fossil-free is 25 years from now, 2043. With a great deal of effort, we could double the rate of improvement in energy efficiency, from the current trend of 1.5% improvement per year to 3%. How much would that shift the deadline? Only one year, it turns out, moving it from 2043 to 2044. Saving energy buys us almost no time.

Unclear effect on transition

What about the second question: will saving energy make it easier or harder to go fossil-free in such a short amount of time? The short answer is that we don't really know. There are arguments going in both directions, but little in the way of any hard evidence. There is more than enough wind and sunshine available to completely replace the fossil fuels we currently use.

One argument supporting energy efficiency is that the less energy we use, the less renewable energy infrastructure we will have to build, and that will make the transition go faster. In some cases there are clear synergies. Electric cars, for example, are far more energy efficient than gasoline or diesel models; at the same time, they make it possible to drive with power generated from the sun, wind, and falling water. Similar synergies can be found comparing electric heat pumps to oil and gas heaters.

On the other hand, there is reason to believe that the investment climate will be more conducive both to innovation, and to building the needed infrastructure, if overall energy demand is growing, or at least not shrinking too fast. Indeed, there are some cases where using more energy could be helpful. In one study, for example, we found the future costs of integrating large amounts of solar into the energy system to be far less if we assume that future electricity demand is highest in the summer, rather than in the winter. That happens when people use air conditioning.

Of course, there are a lot of reasons to save energy. But we don't stop climate change by using less energy—we stop [climate change](#) by using different energy.

More information: Huber, M. Senioren leiden in Zürcher Altersheimen für den Klimaschutz. *Tages Anzeiger* (13.10.2018).

Anthony Patt et al. Will policies to promote energy efficiency help or hinder achieving a 1.5 °C climate target?, *Energy Efficiency* (2018).
[DOI: 10.1007/s12053-018-9715-8](https://doi.org/10.1007/s12053-018-9715-8)

Pfenninger, S. et al. Potential for concentrating solar power to provide baseload and dispatchable power. *Nature Clim. Change* 4, 689–692 (2014).

Provided by ETH Zurich

Citation: Does saving energy save the climate? (2018, December 17) retrieved 20 April 2024 from <https://phys.org/news/2018-12-energy-climate.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.