

Climate change

Electricity demand in southern Europe to soar with air con - scientists

Nicola Davis, the Guardian

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Electricity demand is set to rise in Southern Europe as more people use air conditioning units | Credit: Ilya Ginsburg

Study predicts power consumption to rise with hotter temperatures, increasing need for renewable sources, while northern Europe's demand may fall

Demand for electricity is set to soar in southern **Europe** as climate change takes hold, research has revealed, with the effect likely to be down to a boom in the use of air conditioning.

By contrast, electricity demand is expected to drop in northern countries, leading to an increasingly polarised pattern across the continent - a situation, the researchers say, that bolsters the case for greater integration of electricity supplies across Europe, particularly given the shift to renewable energies.

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"Renewable energies are more time and space variable and you can dampen this [impact] by increasing the grid," said Anders Levermann, professor of dynamics of the climate system at the Potsdam Institute for Climate Impact Research and co-author of the research.

Writing in the journal *Proceedings of the National Academy of Sciences*, Levermann and colleagues from Potsdam University and the University of California, Berkeley, describe how they first looked at data from 2006-2012 for 35 European countries including the UK, taking into factors including population size, effects due to the day of the week, and seasonal variables to extract electricity consumption data relating to temperature alone.

The results reveal that countries across Europe show a similar trend, with electricity consumption increasing either side of about 22C.

The team then used the trend to model electricity demand between 2013 and 2099 under conditions where no efforts are made to mitigate climate change, some efforts are made and finally, if climate change is mitigated as per the **Paris climate agreement**.

The results reveal that overall, the total demand for electricity in Europe overall is expected to remain almost constant. But within Europe, daily peak demand is expected to become polarised, with countries in the north predicted to show a drop and those in the south a boom - a trend bucked by Italy alone, for reasons the researchers say is unclear.

The authors warn the polarisation would be strongest at the end of the century in a scenario where nothing is done to tackle global warming. In this case, the authors say the average maximum daily electrical power demand of Spain and Portugal could rise by up to 5-7 per cent by the end of the century.

Average daily electricity demand showed a similar pattern of polarisation for all but the most ambitious climate change mitigation, while the annual peak demand is shifted from winter to summer.

While Levermann said the rise in electricity consumption in the south would probably be down to an increase in air conditioning, he added it was unclear what was behind the drop in the north, pointing out that many countries do not commonly use electricity for heating.

However the model makes a number of assumptions, not least that there would be no change in technologies or population size, and that populations in the north will indeed respond to warmer temperatures in the future in the manner of those in the south.

Detlef van Vuuren, professor in integrated assessment of global environmental change at Utrecht University, said that the research chimed with findings from his own research looking at the worldwide impact of climate change.

But, he added, the study did not take into account factors such as a shift to electric cars, or increasing wealth - which could also lead to a rise in air-conditioning. "Climate change is not the most important thing for electricity demands in the future," he said.

What's more, he added that solar-powered photovoltaic systems, are expected to play an increasing role in southern Europe, a development that could help mitigate problems and costs around meeting increased peak demand. A greater need for electricity for cooling systems is likely to coincide with conditions that favour electricity production: sunny days.

But Lucas Davis, from the the University of California, Berkeley, who was not involved in the study, said the research could prove valuable in planning infrastructure for future energy needs.

It also highlighted a significant problem, he said.

"What [the authors] are finding is large increases in electricity consumption on hot days - but if this happened tomorrow, the [electricity] system would not be ready," he said, adding that the impact on the use of air conditioning was "one of the big untold stories about climate change", and that more energy-efficient air conditioners and better insulated homes were needed.

"Air conditioning is wonderful - I would not want to live in Houston or Miami or Phoenix without air conditioning - but it puts enormous stress on our electricity systems and results in billions of tonnes of carbon dioxide emission annually," he said.

*This article first appeared at the **Guardian***

*BusinessGreen is part of the **Guardian Environment Network***



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