

Extreme weather to overload urban power grids, study shows

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Extreme hot spells made increasingly likely by climate change could overload urban power grids and cause roving blackouts as an ever-greater share of humanity opt to live in cities, scientists said Monday.

In a series of studies and comment pieces in a special edition of the journal *Nature Energy*, researchers examined how cities can better use renewable [power](#) sources and plan for more frequent and potent temperature swings.

With more than half of mankind expected to live in cities by 2050, existing infrastructure relying on power from fossil fuels is likely to prove insufficient to meet growing demand, as well as the exploding use of air conditioning as urban heat skyrockets in summer.

While [climate change](#) is a long-term phenomenon, an international team of researchers wanted to see what effect short-term weather extremes would have on urban power grids.

They used a host of [climate](#) models to simulate how [electricity demand](#) was likely to rise and fall in 30 Swedish cities during so-called "high impact" [weather events](#).

They found "significant" performance gaps and a high risk of blackouts.

"Extreme weather events could reduce reliability of power supply by 16 percent which can easily lead to blackouts resulting huge economic losses," lead study author Dasun Perera told AFP.

The team also found that increasing hot and cold spells could effect the integration of renewable supplies within existing power grids.

This in turn could have a significant impact on urban air quality and poses a further challenge to governments and cities seeking to shrink their carbon footprint.

"Extreme climate events and their impact on the energy systems are not considered during energy planning at present," said Perera, from the

Solar Energy and Building Physics Laboratory at the Swiss Ecole Polytechnique Federale de Lausanne.

"This can easily lead to a mismatch between demand and generation during extreme climate events resulting blackouts."

'New thinking, new tools'

A study published last week warned that the number of extremely hot days and nights—which pose a significant health risk as the human body doesn't get a chance to cool off—in the Northern Hemisphere could quadruple by 2100.

Even with global air conditioning access set to mushroom as the century progresses, there are still likely to be hundreds of millions of people worldwide put in harm's way by extreme heatwaves.

This figure currently stands at around 1.1 billion people, those who are vulnerable to hot spells but lack the power or funds for cooling equipment.

"Accounting for and formalising the impact of extremes is significant not just because it is the extremes that will break us but because the extremes affect the most vulnerable first and most devastatingly," said a linked editorial.

In a comment piece, US and European researchers said traditional climate modelling often failed to account for [extreme weather events](#).

They said the governments should consider the short-term risk of hot and cold spells when updating or building energy infrastructure.

"Going beyond today's status quo to explore the 'out of the ordinary'

requires new thinking, new experiments, and, quite possibly, new combinations of tools, including off-model analyses," said the authors.

"This is a tall order to be sure, but there is no risk in trying."

More information: Quantifying the impacts of climate change and extreme climate events on energy systems, *Nature Energy* (2020). [DOI: 10.1038/s41560-020-0558-0](https://doi.org/10.1038/s41560-020-0558-0) , [nature.com/articles/s41560-020-0558-0](https://www.nature.com/articles/s41560-020-0558-0)

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