Future energy systems need to be climate proof

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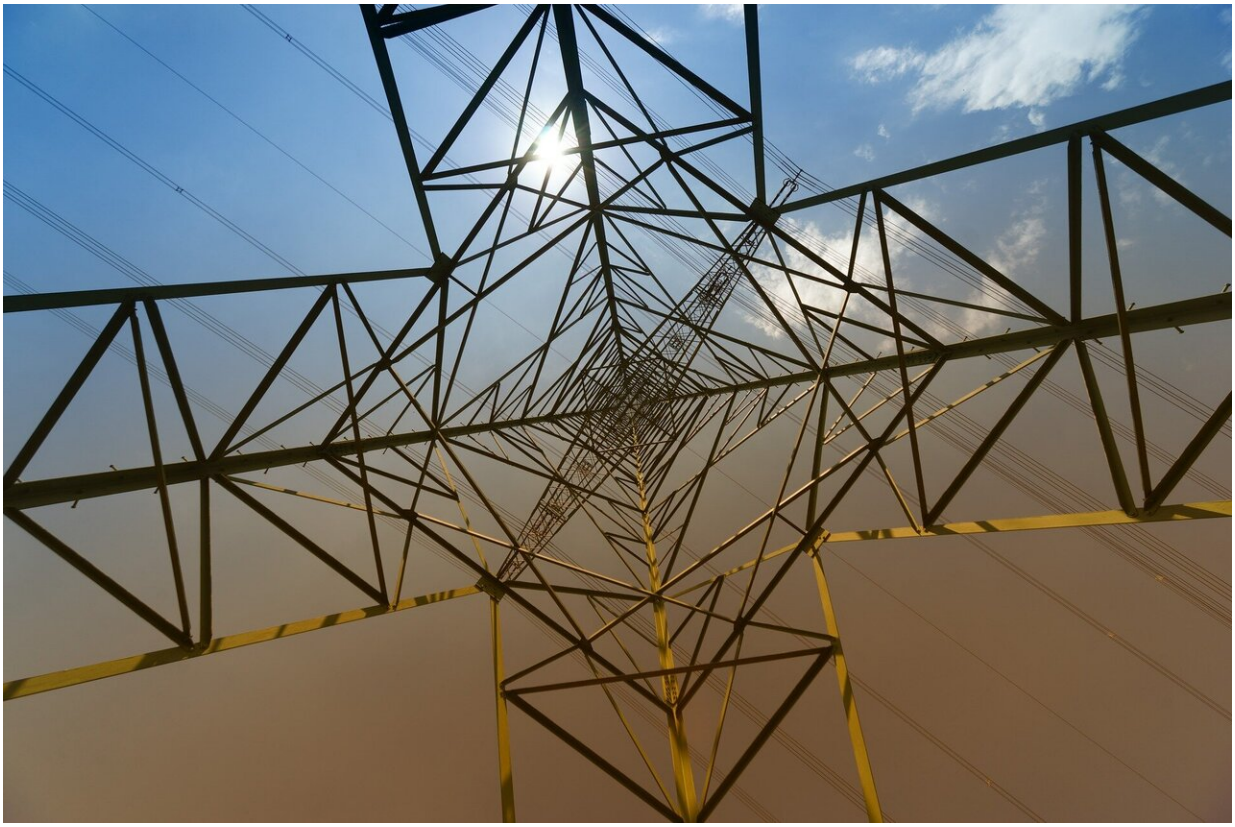

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Climate policy for future energy systems typically focus on the challenge to make them carbon neutral to avoid climate change. However, it will also be critically important to make them climate proof to ensure that

they are resilient to future climate change. This is the key conclusion of a literature review published in *Nature Energy*, analyzing 220 peer-reviewed articles. Climate proofing of energy systems is becoming more important as energy systems are expected to become more sensitive to climate change.

Over the last few years, the number of articles looking at the possible impacts of climate change on energy systems has increased substantially. However, a comprehensive understanding of the potential impacts of climate change on energy systems, particularly at regional and global scales, was lacking. Now, an extensive review was published in *Nature Energy* analyzing the results of 220 articles. The research was led by Utrecht University with contributions of research teams worldwide, including those from the Faculty of Technology, Policy and Management of Delft University of Technology.

A substantial body of literature has focused on climate impacts on cooling and heating energy demand. While heating energy demand is expected to decrease (possibly by up to 20% worldwide), cooling demand is expected to increase substantially (possibly by over 30%). This could also lead to very different seasonal and daily patterns for energy demand.

On energy supply, most articles focus on possible impacts on renewable energy (mostly hydro and wind power). An important motivation is that an increasing share of renewable energy will make future energy systems also more sensitive to climate change. Most studies project (small) decreases in hydropower and thermal energy at the global scale. For other energy resources, results are much more mixed. Impacts at the regional scale are still relatively uncertain, but strongest impacts are reported for South Asia and Latin America.

Dr. Seleshi Yalew (the main author of the study, now working at Delft

University of Technology) says that, as the review highlights, the field is still not well developed: studies still use a wide range of different methods, assumptions, and data sources. For a more comprehensive assessments of climate impacts, more consistent multi-model assessments on consequences of potential climate changes are needed for energy planning.

More information: Seleshi G. Yalew et al. Impacts of climate change on energy systems in global and regional scenarios, *Nature Energy* (2020). DOI: 10.1038/s41560-020-0664-z

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