

# Researchers use a new framework to estimate the potential for energy demand reduction in the UK

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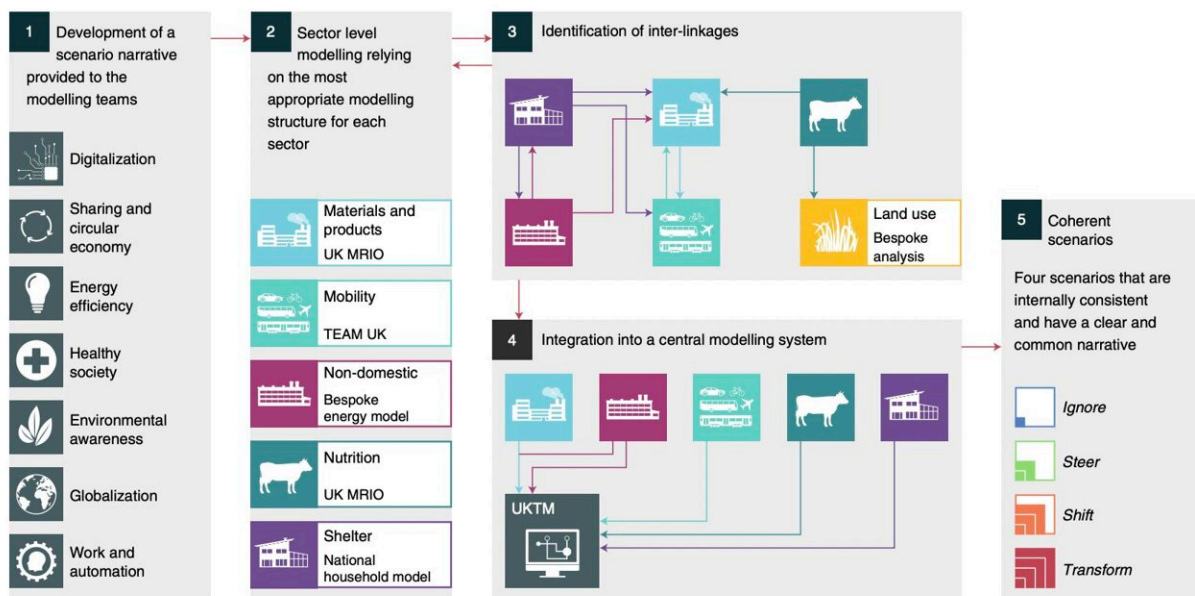


Figure summarising the researchers’ assessment framework for low energy demand scenarios. Each numbered panel represents a step in the methodology used to derive the low energy demand scenarios for the United Kingdom. Credit: Centre for Research into Energy Demand Solutions. Credit: *Nature Energy* (2022). DOI: 10.1038/s41560-022-01057-y

Reducing energy demand worldwide can play a critical role in meeting international climate targets and effectively tackling climate change.

Ultimately, such efforts could relieve some of the pressure on governments to decarbonize the energy supply, as emissions would be significantly reduced.

Nonetheless, even after the signing of the Paris Agreement in 2015, energy demand has continued to grow. From the year 2000, demand has grown by an average rate of 1.9% every year and with the expansion of many megacities worldwide, its increase is not likely to slow down anytime soon.

Meanwhile, much of this demand is still met by burning [fossil fuels](#), while greener and more sustainable energy solutions are only able to cover part of it. Given that the global energy system is still so heavily reliant on carbon and fossil fuels, if the global energy demand keeps growing de-carbonizing will take far longer than anticipated, with detrimental effects on our climate and environment.

Researchers at the Oxford University Center for the Environment and University of Leeds have recently devised a new [framework](#) that could be used to estimate the potential for lowering energy demand at the country level (i.e., in [individual countries](#)). In a recent paper, published in *Nature Energy*, they used this framework to assess the potential for energy demand reduction at the national level in the United Kingdom.

"We develop a bottom-up, whole-system framework that comprehensively estimates the potential for energy demand reduction at a country level," John Barrett and his colleagues wrote in their paper.

The framework developed by the researchers considers various factors could help to reduce energy demand at the country-level. These relate to the use of materials, mobility, non-domestic exchanges, nutrition and shelter.

The framework has five key steps. First, it entails the development of a hypothetical scenario narrative. Subsequently, it requires the development of sector-level models, which follow the most appropriate modeling structure for each sector.

The framework's third step entails the identification of links or connections between sectors. The fourth involves the integration of all sectors into a "central modeling system," to ultimately paint coherent scenarios that are consistent with this system and have a clear, common narrative.

"Replicable for other countries, our framework is applied to the case of the United Kingdom, where we find that reductions in energy demand of 52% by 2050 compared with 2020 levels are possible, without compromising on citizens' quality of life," Barrett and his colleagues wrote in their paper. "This translates to annual energy demands of 40 GJ per person, compared with the current Organization for Economic Co-operation and Development average of 116 GJ and the [global average](#) of 55 GJ."

Using their framework, Barrett and his colleagues highlighted the possibility of significantly reducing energy demand in the U.K. within the next three decades. Should the interventions it outlines be applied to several countries, they could help to meet the global emission goals set by the Paris Agreement.

"Our findings show that energy demand reduction can reduce reliance on high-risk carbon dioxide removal technologies, has moderate investment requirements and allows space for ratcheting up climate ambition," Barrett and his colleagues wrote in their paper. "We conclude that national climate policy should increasingly develop and integrate energy demand reduction measures."

So far, Barrett and his colleagues only used their framework to assess the potential for reducing [energy demand](#) in the U.K. In the future, however, their team and other research groups could apply it to other countries both in the EU and worldwide.

**More information:** John Barrett et al, Energy demand reduction options for meeting national zero-emission targets in the United Kingdom, *Nature Energy* (2022). [DOI: 10.1038/s41560-022-01057-y](https://doi.org/10.1038/s41560-022-01057-y)

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