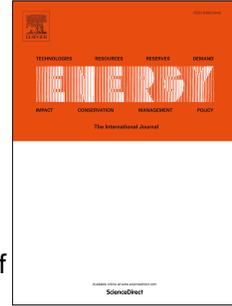


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How much energy will buildings consume in 2100? A global perspective within a scenario framework.

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Abstract

The demand for energy in buildings varies strongly across countries and climatic zones. These differences result from manifold factors, whose future evolution is uncertain. In order to assess buildings' energy demand across the 21st century, we develop an energy demand model—EDGE— and apply it in an analytical scenario framework—the shared socio-economic pathways (SSPs) — to take socio-economic uncertainty into consideration. EDGE projects energy demand for five energy services, four fuel categories, and eleven regions covering the world.

The analysis shows that, without further climate policies, global final energy demand from buildings could increase from 116 EJ/yr in 2010 to a range of 120-378 EJ/yr in 2100. Our results show a paradigm shift in buildings' energy demand: appliances, lighting and space cooling dominate demand, while the weight of space heating and cooking declines. The importance of developing countries increases and electricity becomes the main energy carrier.

Our results are of high relevance for climate mitigation studies as they create detailed baselines that define the mitigation challenge: the stress on the energy supply system stemming from buildings will grow, though mainly in the form of electricity for which a number of options to decrease GHG emissions exist.

Keywords

Buildings energy demand, SSP, Energy models, Projections, Space heating, Space cooling

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