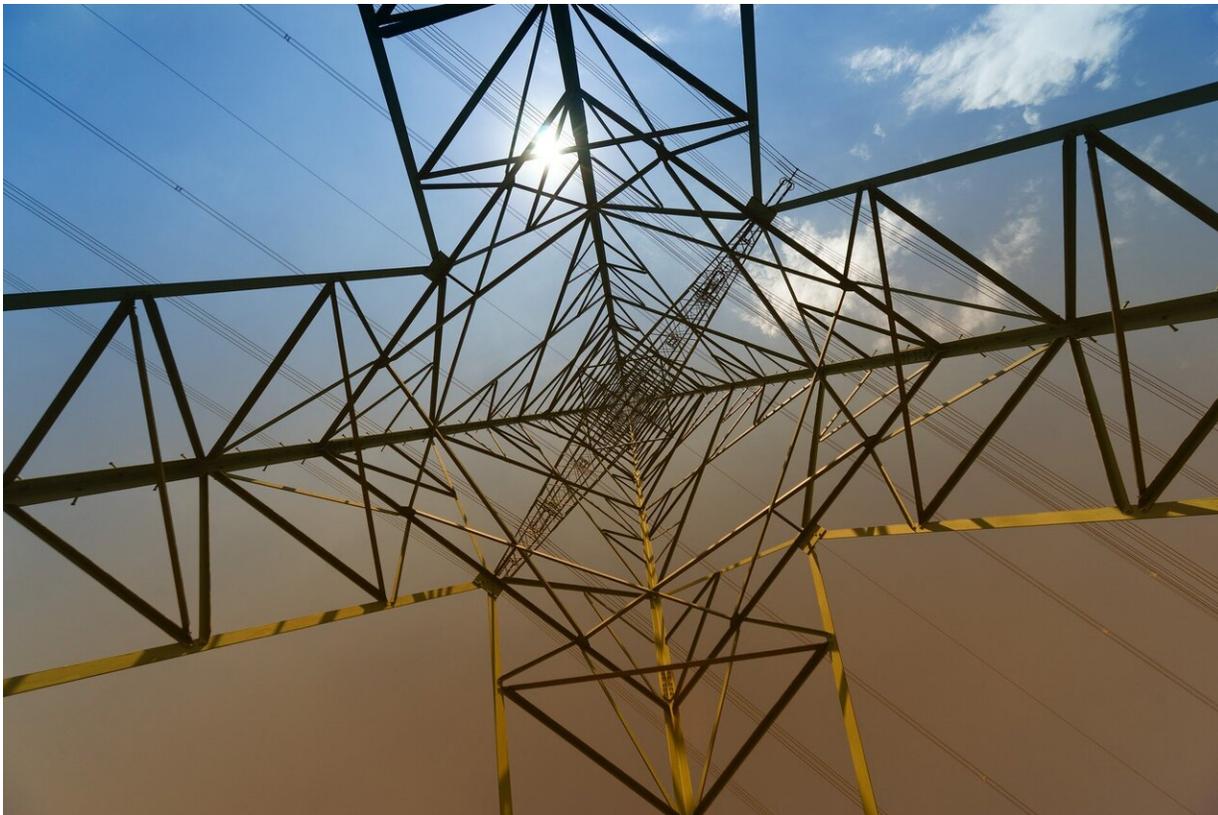


How much energy do we really need?

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Two fundamental goals of humanity are to eradicate poverty and reduce climate change, and it is critical that the world knows whether achieving these goals will involve trade-offs. New IIASA research for the first time provides a basis to answer this question, including the tools needed to relate basic needs directly to resource use.

Researchers have been grappling with the question of how much [energy](#) societies actually need to satisfy everyone's most basic needs for many years, but as global scenarios of climate stabilization assume strong reductions in energy demand growth in the face of the climate crisis—especially in developing countries—finding an answer is becoming crucial. In their study published in the journal *Nature Energy*, IIASA researchers attempted to find out whether meeting everyone's most basic human needs is in fact an impediment for stabilizing [climate change](#).

"People have long worried that economic development and climate mitigation aren't compatible—that the growth required to bring billions of people out of [poverty](#) would make it impossible to reduce net emissions to zero—which is a requirement for climate stabilization. Until now, the research community however had no way to separate out the energy needs for eradicating poverty from countries' overall demand growth. Without this, vast inequalities and unsustainable consumption patterns in developing countries were being ignored," explains study lead author Narasimha Rao, a researcher in the IIASA Energy Program, who is also on the faculty of the Yale University School of Forestry and Environmental Studies.

The researchers chose three developing countries, Brazil, India, and South Africa, and for each country asked what material requirements were underpinning basic human needs; and how the energy resources required to meet these basic needs vary in different contexts (e.g., climate or culture) within each country. In order to do this, they developed a new way of deriving energy demand from basic services rather than from economic growth, so that energy for poverty eradication could be separated from those for affluence.

The results show that the energy needs for providing decent living standards to all in the chosen countries are well below their current

national energy use, and also well below average global energy use per capita. Energy for providing good health and education is far less than that for physical infrastructure, transit and buildings. These energy needs can however be further reduced if countries provide extensive affordable public transit and use local materials in building construction.

"We didn't expect that the energy needs for a minimally decent life would be so modest, even for countries like India where large gaps exist. It was also a pleasant surprise that the most essential human needs related to health, nutrition, and education, are cheap in terms of energy. Along the way, we also found that measuring poverty in terms of these material deprivations far exceeds the World Bank's definition of income poverty," Rao says.

The findings further indicate that affluence, more than [basic needs](#), drives energy demand, and that the bulk of future energy growth in these countries will likely serve the middle classes and affluent, even if governments prioritized poverty eradication. This suggests that close attention should be paid to lifestyles and how they evolve in developing countries. The researchers further emphasize that developing countries have different resource needs to meet the same human development goals. Brazil, for instance, has comparably high energy intensity of mobility due to a high dependence on cars. Because of these differences, developing countries will face different costs and challenges to reduce greenhouse gas emissions from raising citizens' quality of life above a basic standard. Future pledges in the Paris Agreement will have to consider these differences to ensure that countries perceive their efforts as comparable and fair.

"Eradicating poverty need not stand in the way of stabilizing [climate](#) at safe levels. Our study suggests that we need to measure societal progress in terms of these multiple dimensions, not just income, and we should also pay attention to the distribution of growth in [developing countries](#).

This can point us to new ways to improve wellbeing while reducing emissions. Policymakers should give particular attention to investing in public transit, green and locally sourced buildings, and encouraging sustainable diets and food systems. These insights can inform current negotiations under the Paris agreement. Countries should take stock and step up the ambition in their pledges," Rao says.

More information: Energy requirements for decent living in India, Brazil and South Africa, *Nature Energy* (2019). [DOI: 10.1038/s41560-019-0497-9](https://doi.org/10.1038/s41560-019-0497-9) , [nature.com/articles/s41560-019-0497-9](https://www.nature.com/articles/s41560-019-0497-9)

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