EGU22-12238
https://doi.org/10.5194/egusphere-egu22-12238
EGU General Assembly 2022

Reducing the energy demand to achieve universal access to modern energy while ensuring women's well-being: How much energy and carbon can be saved by fertility decline?

Camille Belmin[1,2], Peter-Paul Pichler[1], Guillaume Marois[3,4], Shonali Pachauri[3], and Helga Weisz[1,2]
[1]Potsdam Institute for Climate Impact research, Future Lab Social Metabolism and Impacts, Germany (belmin@pik-potsdam.de)
[2]Humboldt University of Berlin, Germany
[3]International Institute for Applied System Analysis, Austria
[4]Asian Demographic Research Institute, Shanghai University, China

In a climate-constrained world, understanding the energy needs to reach universal access to modern energy is critical. This requires making assumptions on future population trajectories, and developments in energy access can affect them. Yet, this feedback has never been accounted for in energy models. Access to modern energy enhances women's ability to make reproductive choices and leads to fertility decline as it reduces child mortality, improves health, increases women's access to information, education and employment. In this paper, we assess the household energy requirements to expand energy access while considering the relationship between energy access and fertility, using Zambia as a case study. To do so, we built a micro-simulation model of population projection in which fertility depends on access to modern energy and education level, and projected the electricity and cooking energy needs of the Zambian population to 2050, under different scenarios. Our preliminary results show that while electricity consumption is higher in the universal access scenario compared to the baseline scenario, total energy demand is 67% lower, partly due to strong decline in the use inefficient traditional cooking fuels. Reduced population growth due to expanded energy access and education accounts for 15% of this reduction in rural areas, and 8% overall. Although the challenge of achieving universal access to modern energy seems daunting, our results suggest that this goal could be co-beneficial to achieving climate goals. Our study also reveals that accounting for the energy-population nexus in energy models would scale down the currently assumed energy needs to ensure decent well-being for all.