

Sun shines on the richest: New study explores how to make solar PV viable for all

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Sampling strategy for community interviews and neighborhood site visits across four areas of Brighton and Hove, United Kingdom. Credit: *Energy Policy* (2022). DOI: 10.1016/j.enpol.2022.112868

More government support with greater flexibility is needed to make solar panels a viable option for elderly homeowners, student renters and

the disabled, new research from the University of Sussex Business School warns.

The research calls for policy initiatives such as [tax incentives](#) and grants to help lower the cost of installing solar into neighborhoods with high deprivation. The academics recommend broadening out recent interest-free loan systems for [electric vehicles](#) to incorporate the installation of photovoltaic panels as part of more flexible policies that address distinct solar challenges experienced by different households.

Expansion of shared-ownership business models, including cooperatives or council-led schemes offering solar deployment and maintenance to homes unable to pay, would help students, renters and non-homeowners to also benefit from solar PV deployment, recommends the paper published today in the journal *Energy Policy*. While existing schemes were welcomed by households for helping PV systems to be rolled out, the study identified subsequent issues which highlights a need for a rethink of those policies to ensure they are attentive to emerging inequities.

The study identified that households experience living with PV systems in quite different ways and did not always receive the maximum benefit. The research identified some homeowners who used their solar energy generation to justify increased use of electrical appliances such as TVs, clothes driers in the summer and hot tubs. The researchers suggest progressive energy tariffs or in-home displays, as part of a package of wider energy awareness and demand reduction measures, could help disincentivize this rebound behavior.

The authors identified the need for policies that met the challenges of maintenance, repair, removal and remanufacture of solar PV systems and not just their installation including extended producer responsibility and takeback schemes for broken or retired solar systems to tackle a

growing waste issue within the industry.

In addition, the researchers advocate that measures to make PV more equitable and circular will address inequities beyond benefitting households and reaching back into supply chains. The study recommends rigorous industry standards on supply chain transparency, including amendments to the Modern Slavery Act 2015 to target all low-carbon technologies, to ensure the transition to a low-carbon economy in the UK is not directly connected to poor, illegal, or inhumane labor practices within global solar supply chains.

Benjamin K Sovacool, Professor of Energy Policy in the Science Policy Research Unit (SPRU) at the University of Sussex Business School, said:

"Our study finds that solar energy adoption can exacerbate inequalities in many different ways including its availability to different groups of people and depending on whether one rents or owns their home. There are also disparities in terms of where people live in the UK and the availability of a skilled workforce or infrastructure to support [solar power](#), inequity in the way that pollution and waste can impact nature, and a generational imbalance in the future burdens of maintenance and repair and rebounds in energy consumption.

"Our study uncovers previously unexplored inequities, notably the dominance of patriarchal figures in making decisions and having control over household energy, the exclusion of the elderly, student renters, or the disabled, the temporal risk of breakdowns and unexpected failures, and qualitative explanations for solar rebounds."

Dr. Marie Claire Brisbois, Senior Lecturer in Energy Policy in the Science Policy Research Unit (SPRU) at the University of Sussex Business School, said:

"With solar power predicted to grow 30-fold by 2050 and with the potential to meet more than half the globe's electricity demand by the start of the next decade, it is vital that no section of society is left behind in this energy revolution."

The study centered around a novel framework looking at demographic inequities (between groups), spatial inequities (across geographic scales), interspecies inequities (between humans and non-humans), and temporal inequities (across present and future generations).

The researchers analyzed the experience of solar inequities amongst a small sample of early adopters and residents in Brighton and Hove (ranking 205th out of 391 UK [local authorities](#) reporting PV installations) to understand how their experiences compared with injustices detailed in research literature and how these experiences might inform policies for a more socially just future rollout of solar PV.

The study identified social awareness of inequities amongst hosts of solar PV systems, and outlines measures that can be taken within solar policy and strategy to improve the justness of future deployments.

- Demographic inequities, such as unfair adoption patterns within social groups often categorized by gender, income, age, or race, can be partially remedied by cheaper, smaller systems or shared ownership business models.
- Spatial inequities, such as lack of access to clean air in local environment, can be offset by targeted skills training or policy incentives that seek to even out geographic adoption patterns.
- Interspecies equity, including the destruction of ecosystems, habitats, and extinction of non-human species, can be addressed by more sustainable extraction of solar PV's raw minerals or stronger recycling and waste requirements.
- Temporal inequities, such as shifting burdens onto future

generations or issues of intergenerational equity, can be addressed through innovations in technology (especially inverters & via recycling PV materials) and extended producer responsibility.

Adrian Smith, Professor of Technology and Society in the Science Policy Research Unit (SPRU) at the University of Sussex Business School, said:

"Our fossil-fueled energy systems have already caused iniquitous climate change impacts; policy-makers need to make sure measures for rolling out alternatives, like solar energy, realize their potential for more sustainable and just outcomes."

Dr. Max Lacey-Barnacle, Research Fellow in Just Transitions in the Science Policy Research Unit (SPRU) at the University of Sussex Business School, said:

"The recent announcement by the UK Government around increasing energy security through greater deployment of renewables features an aim to triple the amount of solar power in the UK by 2030.

"In light of this announcement, solar advocates, manufacturers, and policymakers can least afford to ignore the mounting justice issues associated with current patterns of adoption, particularly if this pace of adoption is tied to increasing [energy](#) security concerns. Through directly addressing or acknowledging some of the inequities we have outlined in our paper, policymakers can facilitate future solar schemes that may foster greater social acceptance and enhance more equitable outcomes."

More information: Benjamin K. Sovacool et al, Towards improved solar energy justice: Exploring the complex inequities of household adoption of photovoltaic panels, *Energy Policy* (2022). [DOI:](#)

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