



Vortrag im Rahmen des Seminars

Forschungskolloquium | Research Seminar

Autor:

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Titel:

"Accounting for the solar rebound effect alters Europe's energy transition"

Abstract:

"The solar rebound effect (SRE) occurs when rooftop photovoltaic (PV) adoption increases household electricity consumption, driven by the perception of solar energy as a 'free' resource. Although empirically observed, the SRE has not yet been accounted for in energy system modeling or abatement scenarios. This study integrates empirically derived SRE intensities into an open-source optimization model of the European energy system, translating behavioral effects into temporally distinct demand profiles. The results show that not only the magnitude but also the timing of the rebound determines its system impact. Additional demand raises renewable investment needs, flexibility requirements, and overall system costs, while inducing regressive effects as households driving the rebound do not bear its full costs. The findings call for explicit inclusion of SRE in abatement scenarios and grid planning, and highlight load-shifting incentives and energy-efficiency policies as key tools to mitigate rebound effects and align demand with renewable generation."