Ending the daily work commute may not cut energy usage as much as one might hope

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A mass move to working-from-home accelerated by the Coronavirus

pandemic might not be as beneficial to the planet as many hope, according to a new study by the Centre for Research into Energy Demand Solutions (CREDS).

The majority of studies on the subject analysed by University of Sussex academics agree that working-from-home reduced commuter travel and energy use—by as much as 80% in some cases.

But a small number of studies found that telecommuting increased energy use or had a negligible impact, since the energy savings were offset by increased travel for recreation or other purposes, together with additional energy use in the home.

The authors found that more methodologically rigorous studies were less likely to estimate energy savings—all six of the studies analysed that found negligible energy reductions or increases were judged to be methodologically good.

Dr. Andrew Hook, Lecturer in Human Geography at the University of Sussex, said: "While most studies conclude that teleworking can contribute energy savings, the more rigorous studies and those with a broader scope present more ambiguous findings. Where studies include additional impacts, such as non-work travel or office and home energy use, the potential energy savings appear more limited—with some studies suggesting that, in the context of growing distances between the workplace and home, part-week teleworking could lead to a net increase in energy consumption."

Dr. Victor Court, Lecturer at the Center for Energy Economics and Management, IFP School, said: "It is our belief from examining the relevant literature that teleworking has some potential to reduce energy consumption and associated emissions—both through reducing commuter travel and displacing office-related energy consumption. But

if it encourages people to live further away from work or to take additional trips, the savings could be limited or even negative."

Studies indicate it would be better for workers to continue working from home for all of the working week rather than splitting time between office and home once lockdown rules are relaxed. Similarly, companies will need to encourage the majority of staff to switch to home working and to downsize office space to ensure significant energy savings.

Even the mass migration of workers to home working might have only a small impact on overall energy usage. One study noted that even if all US information workers teleworked for four days a week, the drop in national energy consumption would be significantly less effective than a 20% improvement in car fuel efficiency.

The study also warns that technological advances could erode some of the energy savings due to the short lifetime and rapid replacement of ICTs, their increasingly complex supply chains, their dependence on rare earth elements and the development of energy-intensive processes such as cloud storage and video streaming.

The authors add that modern-day work patterns are becoming increasingly complex, diversified and personalised, making it harder to track whether teleworking is definitively contributing energy savings.

Steven Sorrell, Professor of Energy Policy at the Science Policy Research Unit, University of Sussex, said: "While the lockdown has clearly reduced energy consumption, only some of those savings will be achieved in more normal patterns of teleworking. To assess whether teleworking is really sustainable, we need to look beyond the direct impact on commuting and investigate how it changes a whole range of daily activities."

The paper, published in *Environmental Research Letters*, provides a systematic review of current knowledge of the energy impacts of teleworking, synthesising the results of 39 empirical studies from the US, Europe, Thailand, Malaysia and Iran published between 1995 and 2019.

Among the potential energy increases from working-from-home practices the study identified include:

- Teleworkers living further away from their place of work so making longer commutes on days they worked in the office—one study found UK teleworkers have a 10.7 mile longer commute than those who travelled into work every day.
- The time gained from not participating in daily commute used by teleworkers to make additional journeys for leisure and social purposes.
- Teleworking households' spending money saved from the daily commute on goods, activities and services also requiring energy and producing emissions.
- Isolated and sedentary teleworkers taking on more journeys to combat negative feelings.
- Other household members making trips in cars freed up from the daily commute.

Benjamin K Sovacool, Professor of Energy Policy at the Science Policy Research Unit, University of Sussex, said: "The body of research on the subject shows that it is too simple to assume that teleworking is inevitably a more sustainable option. Unless workers and employers fully commit to the working from home model, many of the potential energy savings could be lost. A scenario after the threat of Coronavirus has cleared where workers will want the best of both worlds; retaining the freedom and flexibility they found from working from home but the social aspects of working at an office that they've missed out on during

lockdown, will not deliver the energy savings the world needs."

More information: Andrew Hook et al, A systematic review of the energy and climate impacts of teleworking, *Environmental Research Letters* (2020). DOI: 10.1088/1748-9326/ab8a84

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