RESEARCH ARTICLE

DECARBONIZING THE WORKFORCE: THE ROLE OF REMOTE WORK IN ACHIEVING A NET-ZERO ECONOMY

*Christian Hald-Mortensen

Executive MBA, Danish Technical University

ARTICLE INFO	ABSTRACT
	This paper examines the potential of post-COVID remote work to decarbonize the workforce and support the transition to a net-zero economy. By reducing commuting and decreasing the demand for office space, remote work can help to cut greenhouse gas emissions. It highlights that, to reduce the climate impact of the transportation sector, which is responsible for 28% of U.S. emissions, cutting back on commuting presents an easily achievable way to save on greenhouse gas emissions. Furthermore, remote work can help reduce road congestion, leading to fewer costs for road expansion. Remote work also promotes energy savings in office operations and reduces overall resource use. By adopting flexible work models, businesses can contribute to emission reductions while enhancing employee satisfaction and organizational sustainability. As organizations adapt to the growing demand for eco-friendly practices, remote work presents a cost-effective solution to mitigate climate change while promoting work-life balance.

INTRODUCTION

Sector-specific strategies and industrial policies are needed to accelerate technological development and adoption, as global agreements alone are too slow to drive rapid decarbonization. A notable expert on decarbonization, David G. Victor from University of California San Diego argues that addressing climate change requires a strategic focus on deep decarbonization. There is a need to be pragmatic, practical and implement scalable technological revolutions across key sectors, like energy and steel. Victor emphasizes that early action from progressive nations and industries is essential to lead by example and create incentives for broader global cooperation[1]. In addressing the climate crisis, a range of sectoral changes are needed, and early efforts from Socolow and Pacala (2004) described an approach using stabilization wedges with major efforts across key parts of society. We know that new technologies such as green hydrogen, fuel-cell powered trains, small-scale nuclear power and sustainable aviation fuels must be deployed across key emitting sectors.

Major systemic change is needed in industry, agriculture, transportation, and housing. But one overlooked aspect is the decarbonization of the workforce and our work habits. In fact, achieving a net-zero economy requires systemic changes as well as changing everyday practices. While such large-scale efforts are essential, individual contributions also matter. Reducing carbon emissions can start with our daily lives, particularly in the workplace. The shift toward remote work, especially post-COVID, offers an opportunity to minimize the climate impact of professional activities. This paper examines how remote work trends can lower emissions and contribute to a decarbonized workforce.

Research Objective: To examine the potential of remote working as a strategy for reducing carbon emissions in the workforce, and its contribution to achieving a net-zero economy, especially in the post-COVID context.

Research Question: How can remote work practices reduce carbon emissions and support the decarbonization of the workforce, contributing to broader efforts in achieving a net-zero economy?

---

[1] https://e360.yale.edu/features/deep-decarbonization-a-realistic-way-forward-on-climate-change

DISCUSSION

Environmental Benefits of Working From Home: Remote work offers significant environmental advantages. It reduces the demand for office space, leading to lower energy consumption for heating, cooling, and lighting.

This also results in less resource use, such as paper and office supplies, further decreasing the overall environmental footprint of businesses. But the main emission drive of the workforce is the daily commute. Commuting is a major contributor, of our personal footprint, especially with light-duty vehicles responsible for 57% of transportation emissions in the U.S.[2] Therefore, working from home plays a critical role in reducing emissions from transportation, which accounts for 28% of U.S. greenhouse gas emissions. In fact, the average American spends 52 minutes commuting daily, and reducing this through remote work directly cuts emissions.[3] Working from home even one or two days a week can reduce the number of cars on the road, lowering both emissions and the demand for public transport. This gradual shift not only lessens the carbon released into the atmosphere but also alleviates road congestion, and reduces the need for new roads, creating both environmental and economic benefits.[4,5] Expanding roads in the U.S. to accommodate more traffic is both costly and environmentally damaging, adding to congestion and increasing emissions.

There are quite different estimates of greenhouse gas (GHG) emission reductions from telecommuting. One recent study from Global Workplace Analytics estimates that if 3.9 million people worked from home at least half the time, the reduction in greenhouse gas emissions would be equivalent to taking 600,000 cars off the roads for an entire year. This is comparable to the emissions offset by planting 91 million trees, which is noteworthy in a time where some governments are focused on tree-planting.[6] Moreover, studies suggest that working from home could reduce energy use by up to 77%, a substantial contribution to decarbonization efforts. These savings are further enhanced by reduced commuting, and a decreased demand for fossil fuels.

By adopting half-time teleworking, the U.S. could save $12 billion annually, prevent fatalities, and avoid 99,000 injuries[7]. Another study estimate that if 50% of office workers teleworked, emissions from transportation would decrease by over 689 million tons of CO2, equivalent to taking 1.76 million cars off the road each month. This reduction highlights the crucial role that remote work plays in decarbonizing a commuting workforce. As recent research indicates, commuting and work-related travel account for almost 98% of the carbon footprint of a full-time worker[8]. Therefore,

prioritizing changes in commuting habits and making everyday changes are important steps individuals can take for achieving a net-zero economy.

The Employer Perspective: Reaching Corporate Emissions Targets: Employers can lower their office carbon footprint by supporting remote working. Teleworking saves employers $11,000 per employee annually and reduces energy use significantly, primarily through reductions in real estate, coste, electricity, maintenance and absenteeism costs[9].

Trusting employees, implementing performance-based systems, and providing suitable work environments are crucial for successful teleworking strategies. Fewer office buildings reduce the significant carbon footprint from buildings; recall that 40% of GHG emissions globally come from the building sector[10]. Reducing office space demonstrates leadership in corporate responsibility, positioning companies as proactive contributors while helping them to reach their corporate climate targets. Employers can further support these initiatives by offering financial incentives for employees to set up energy-efficient home offices, ensuring that the environmental impact of remote work is minimized on both ends.

Moreover, by implementing digital tools and platforms that facilitate seamless remote collaboration, companies can maintain productivity while reducing reliance on physical office spaces.

Employers can take proactive steps by requiring office parks they lease to meet sustainability standards or by conducting a full carbon footprint analysis of their office spaces. Offices can be made more energy-efficient by incorporating renewable energy sources and encouraging employees to use public transportation or biking as preferred commuting options. The positive thing is that commercial properties are becoming more energy-efficient, but they still use energy for lighting, heating, and cooling.

Work in the Future and the Flexible Work Place: Where does the need for decarbonization and these discussions take us? The work-from-home trend, initially driven by the COVID-19 pandemic, has continued to thrive post-pandemic. The influx of a more climate conscious Generation Z into the workforce is further incentivizing employers to decarbonize and contribute to the movement toward a net-zero economy. These new generations not only seek flexible work hours and a better work-life balance, but are also pushing organizations to adopt more eco-friendly practices.[11].

Apart from decarbonization, a broader trend is at play. Danish sociologist and futurist Anne Skare Nielsen argues that the pandemic highlighted the need for flexibility, and accommodating diverse work styles, especially for introverts who thrived in environments with more solitude and less social pressure[12]. She emphasizes that more flexible work models, including remote work and customizable schedules, boost productivity, improve mental well-being, and reduce burnout. Post-pandemic, Nielsen advocates for experimenting

[2] https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions
[3] https://www.ridester.com/average-us-commute/
[4] https://www.census.gov/library/visualizations/interactive/travel-time.html
[5] How Remote Work Supports UN Sustainable Development Goal No. 11 of Sustainable Cities and Communities | FlexJobs
[6] http://globalworkplaceanalytics.com/
[7] https://globalworkplaceanalytics.com/resources/costs-benefits
[8] Beno, Michael, (2021) The Advantages and Disadvantages of E-working: An Examination using an ALDINE Analysis, April 2021, Emerging Science Journal 5:11-20

[9] https://globalworkplaceanalytics.com/resources/costs-benefits
[10] Buildings & Built Infrastructure | EESI
[11] https://www.anthropocenemagazine.org/2020/05/the-hidden-carbon-tradeoffs-of-telecommuting/
[12] https://offentligledelse.dk/hjaelp-de-introverte-tilbage-paa-arbejde-lad-dem-blive-hjemme/

with new organizational structures that prioritize trust and autonomy. In this way, employees can better align their work with personal preferences and needs[13].

CONCLUSION

Remote work has emerged as a key strategy in the decarbonization of the workforce, aligning with the global push toward a net-zero economy. By reducing commuting and office space demands, teleworking lowers greenhouse gas emissions, especially in transportation—a sector responsible for 28% of U.S. emissions. The climate benefits extend beyond transportation, encompassing energy savings in commercial buildings and reduced resource consumption in office operations. Businesses can thus cut both their carbon footprint and operational costs, all while fostering employee satisfaction and contributing to broader sustainability goals. The potential of remote work to reduce emissions is substantial. If a significant percentage of employees worked remotely at least half the time, the corresponding decrease in transportation emissions would equal removing millions of cars from the road. Such reductions are needed in the pursuit of a net-zero economy, making remote work a valuable tool for organizations looking to meet corporate emissions targets and contribute to environmental sustainability.

From a broader perspective, the legacy of COVID-19 has solidified remote work as a mainstream practice. The pandemic catalyzed a rapid shift to working from home, demonstrating its feasibility and climate impact on a large scale. This transition offers a glimpse into how future workforce practices can contribute to decarbonization. The enduring shift toward remote and hybrid work models post-pandemic reflects an opportunity to embed sustainability into daily work routines, addressing climate challenges while fostering innovation in work culture. This transformation, driven by the COVID-19 experience, underscores the importance of integrating flexible, environmentally conscious work models in the global effort to combat climate change.

Disclaimer: The contents of this research article are not meant to recommend courses of actions or investment decisions on the basis of the issues identified and analyzed. The contents are intended to inform you as a reader, and to identify research and policy gaps for further work. Any financial gain or loss incurred by a reader because of this article will result from decisions taken by the reader as an individual. The opinions expressed in this research article are my own as an individual, and do not reflect the opinions of my current employer.

REFERENCES

Beno, Michael. "The Advantages and Disadvantages of E-working: An Examination Using an ALDINE Analysis." *Emerging Science Journal*, vol. 5, no. 11, 2021, pp. 11–20.

Chiu, Yi. "The Hidden Carbon Tradeoffs of Telecommuting." *Anthropocene Magazine*, 26 May 2020, https://www.anthropocenemagazine.org/2020/05/the-hidden-carbon-tradeoffs-of-telecommuting/.

Evreka. "The Environmental Benefits of Remote Working." *Evreka*, 2024, https://evreka.co/blog/the-environmental-benefits-of-remote-working/.

Environmental and Energy Study Institute. "Buildings & Built Infrastructure." *EESI*, https://www.eesi.org/topics/built-infrastructure/description.

EPA. "Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions." *EPA.gov*, https://www.epa.gov/ greenvehicles/ fast-facts-transportation-greenhouse-gas-emissions.

FlexJobs. "How Remote Work Supports UN Sustainable Development Goal No. 11 of Sustainable Cities and Communities." *FlexJobs*, https://www.flexjobs.com/b log/post /how-remote-work-supports-un-sustainable-development-goal-no-11/.

Global Workplace Analytics. "Costs and Benefits." *Global Workplace Analytics*, https://globalworkplaceanalytics. com/ resources/costs-benefits.

Offentlig Ledelse. "Hjælp De Introverte Tilbage På Arbejde: Lad Dem Blive Hjemme." *Offentlig Ledelse*, https:// offentligledelse.dk/hjaelp-de-introverte-tilbage-paa-arbejde-lad-dem-blive-hjemme/.

Reload. "Anne Skare Nielsen Livestream." *Reload*, https://reload.dk/viden/anne-skare-nielsen-livestream.

Ridester. "Average U.S. Commute." *Ridester*, https://www. ridester.com/average-us-commute/.

U.S. Census Bureau. "Travel Time to Work: 2019." *Census.gov*, https://www.census.gov/library/ visualizations/ interactive/travel-time.html.

Victor, David G. "Deep Decarbonization: A Realistic Way Forward on Climate Change." *Yale E360*, 28 Jan. 2020, https://e360.yale.edu/features/deep-decarbonization-a-realistic-way-forward-on-climate-change.

---

[13] https://reload.dk/viden/anne-skare-nielsen-livestream

****