COP must reverse rising pessimism over building sector decarbonization, new study argues

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Social media engagement with climate policy events is vital to reducing building emissions and ensuring environmental justice, research led by

the University of Cambridge suggests.

Negativity on Twitter about decarbonizing the built environment has increased by around a third since 2014, according to a new analysis of more than 250,000 tweets featuring #emissions and #building between 2009 and 2021.

The pessimistic trend has followed the launch of major climate action reports. The study, published today in *Nature Scientific Reports*, reveals that expressions of 'fear' in Twitter dialogue increased by around 60% following the launch of the IPCC's Fifth Assessment Report on Climate Change in 2015.

The researchers, from Cambridge, Boston, Sussex and Aarhus Universities and Caltech, also found that 'sadness' increased by around 30% following the IPCC Special Report on Global Warming 1.5 C in November 2019; while debate in November 2020 over lobbying of builders and utility companies over non-compliance with new building codes in the US triggered a spike in 'anger'.

Mapping tweets that caused spikes in emotional engagement revealed that public concerns triangulated around inaction towards emission reduction, the fairness of carbon tax, the politicization of building codes (distinctively seen for the US) and concerns over environmental degradation. This demonstrates, the researchers argue, "a strong environmental justice discourse."

The findings appear on the heels of COP27's building sector events (10th—14th November), which sought to promote a just transition and enhancing building resilience with the tagline 'Build4Tomorrow'.

Lead author Ramit Debnath, Cambridge Zero Fellow at the University of Cambridge and a visiting faculty associate in Computational Social

Science at Caltech, says:

"Major climate policy events including COP have emphasized how difficult it is to decarbonize the built environment and this has been reflected in the rise of negative feelings on social media.

"But our research also offers hope—we found that climate policy events can and do foster public engagement, mostly positive, and that this has the power to increase the building sector's focus on environmental justice.

"To build for tomorrow fairly, global climate action has to incorporate and empower diverse public voices. Policy actions are no longer isolated events in this digital age and demand two-way communication. Policy events and social media have a crucial role to play in this."

The study highlights that the building sector is one of the most important and challenging to decarbonise. The IPCC suggests that restricting climate change to 1.5∘C requires rapid and extensive changes around energy use, building design, and broader planning of cities and infrastructure. The buildings and [construction sector](link) currently accounts for around 39% of global energy and process-related carbon emissions. The International Energy Agency estimates that to achieve a net-zero carbon building stock by 2050, direct building carbon emissions must decrease by 50%, and indirect building sector emissions must also decrease 60% by 2030.

But decarbonising the building sector is challenging because it involves a complex overlap of people, places and practices that creates a barrier to designing just emission reduction policies. The study argues that democratizing the decarbonization process "remains a critical challenge across the local, national and regional scales".

Debnath says: "Our findings shed light on potential pathways for a people-centric transition to a greener building sector in a net-zero future."

Using advanced natural language processing and network theory, the researchers found a strong relationship between Twitter activity concerning the building sector and major policy events on climate change. They identify heightened Twitter engagement around developments including: the Paris Agreement's call for the building sector to reduce its emissions through energy efficiency and address its whole life cycle; COP-23's 'Human Settlement Day' which focused on cities, affordable housing and climate action; COP25's discourse on green/climate finance for residential homes; and COP26's 'Cities, Region and Built environment Day'.

The researchers found that despite negative sentiments gaining an increasing share since 2014, positive sentiments have continued to multiply as Twitter engagement has exploded. Across the entire study period (2009–21), positive sentiments have fairly consistently maintained a larger share of the conversation than negative sentiments.

The study highlights the fact that core topics covered by tweets have changed significantly over time, as new innovations, technologies and issues have emerged. Hashtags associated with COP26, for instance, included #woodforgood and #masstimber, as well as #housingcrisis, #healthybuildings #scaleupnow, and #climatejusticenow, all largely or entirely absent in Twitter conversations between 2009 and 2016.

The researchers found that discourse on innovative emissions reduction strategies which remain uncommon in the building sector— including use of alternate building materials like cross-laminated timber; implementing climate-sensitive building codes; and the circular economy —inspired Tweets expressing 'anticipation'.

Debnath says: "COP26 was an extraordinary moment—the Twitter engagement surrounding the event connected public health, the circular economy, affordable housing, and decarbonisation of the built environment like never before."

"We are seeing a paradigm shift in the building emission discourse towards broader social and environmental justice contexts. Reference to low-carbon alternatives to concrete, housing crisis, scaling-up and climate justice are all part of the growing social justice movement associated with healthy and affordable social housing narratives globally."

The study notes that considering the size of Twitter's current user base (around 211 million users globally), the number of tweets about emissions in the building sector, remains relatively small.

Debnath says: "It's crucial that policymakers raise the salience of these issues and develop communications strategies to emphasize the importance of climate action in hard-to-decarbonise sectors like the building sector."

The authors of the study intend to continue to analyze social media interaction with further climate policy events, beginning with COP27.

Co-author Professor Benjamin Sovacool, Director of Institute for Global Sustainability at Boston University said: "Some people dismiss Twitter as a poor focus of academic research, given its ability to spread misinformation and fake news. But we instead see it as a lens into the inner workings of how millions of people think, and rethink, about energy and climate change. It offers an incredible opportunity to reveal people's true intentions, their revealed preferences, in unbiased form on a public forum."

Co-author Prof R. Michael Alvarez, Professor of Political and Computational Social Science at Caltech, said: "This is an innovative and important study, showing how an interdisciplinary and international group of scholars can use big data and machine learning to provide policy guidance on how to decarbonize the build sector. Research like this is critical at this time, to inform the debates at forums like COP27 and to energize additional scholarly work that can help further our goal of democratizing climate action."

The paper is co-authored by Dr. Ramit Debnath (Cambridge Zero and Churchill College, University of Cambridge, and Caltech), Prof Ronita Bardhan (Selwyn College, Cambridge), Prof. Darshil U. Shah (St John's College, Cambridge), Prof. Kamiar Mohaddes (King's College, Cambridge), Prof. Michael H. Ramage (Sidney Sussex College, Cambridge), Prof. R. Michael Alvarez (Caltech) and Prof. Benjamin Sovacool (Boston University, Aarhus University and University of Sussex).

  More information: Social media enables people-centric climate action in the hard-to-decarbonise building sector, *Scientific Reports* (2022). DOI: 10.1038/s41589-022-23624-9

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