1 Introduction: Changing Our Ways

What is the role of behaviour change in addressing the climate crisis? Sustainable behaviour change is rapidly rising up the climate policy agenda as many governments, cities, and corporations look to bolster the ambition and effectiveness of their climate policies.[1] After a long period where global climate policy predominantly focused on economic and technological initiatives, international bodies increasingly recognise the importance of behaviour change as part of broader efforts to achieve the Paris Agreement goal of restricting global warming to well below 2°C and aiming to halt temperatures at 1.5°C. The Intergovernmental Panel on Climate Change (IPCC), United Nations Environment Programme (UNEP) Emissions Gap report, and many models of how to achieve ambitious climate goals, now include the role of behaviour change.

Yet how to scale it in line with these targets remains a neglected topic. *Scaling* behaviour change requires a broader understanding of behaviours as collective, social, political, and cultural, and not just individual and economic: reducible to the sum of discrete consumption practices and 'choices' in the market. Understanding the everyday practices of governments, cities, corporations, and other social actors as forms of behaviour helps to reveal the interconnected nature of change where individual acts, however seemingly atomised, are never undertaken in isolation from the contexts in which they take place, impact upon, and which shape them. It takes us beyond the false binary of individual and system change. Moving from the individual and household 'outwards' as an additive approach to scaling will not achieve change at the speed and scale required if it neglects the drivers of consumption: the creation of demand, the embedding of cultural values and norms, and the relations of power that normalise and benefit from unsustainable consumption. Addressing these issues offers scope for more transformative change across society while addressing the inequities that leave the majority without access to basic goods and services and a minority over-consuming them.

Even when behaviour change is integrated into climate policy discourses, it is often treated in isolation from the underlying political and social forces driving fossil fuel consumption. We argue in this Element that production and consumption need to be better integrated in order to unlock the social transformation necessary to secure a low-carbon future. To do this, we suggest that scaling

[1] To be clear, 'sustainable behaviour change' refers to the need for behaviours to be more sustainable and in our case with particular reference to the need for radical decarbonisation. It should not be confused with sustaining current behaviours and hence frustrating attempts to change behaviours.

change needs to use all levers and tools within an ecosystem of transformation. Which tools and strategies are available to whom will depend on social and economic hierarchies and inequities, as well as the diverse contexts in which change is sought. We do not proffer one overarching theory of change here but rather draw on insights from a range of academic scholarship and the experience of practitioners to suggest useful intervention points for scaling change in line with the goals of the Paris Agreement. However, we are steadfast in our view that the privilege of choosing between systems change and individual change has long since passed. It is a false binary, and we now need both. Fostering a more holistic understanding of sustainable behaviour change that bridges both system and individual is foundational for scaling the transformative change we need to see.

Background

Behaviours change. That much we know. And if we were in any doubt about the speed with which they can change, the scale of their effects, the COVID-19 pandemic has served as a sharp reminder. But the COVID crisis has also revealed the deep inequalities that run through, within and between societies and the disproportionately adverse consequences faced by society's most vulnerable communities, highlighting how critical it is that transitions are grounded in social justice. Beyond such times of crisis, behaviours also change at key moments in our lives, when we have children, retire, or move home. They are shaped by a range of family, community, regional, and broader societal influences, as well as physical infrastructures. But there is little consensus about how best to deliberately shape and directly influence everyday behaviours around transport, food, and energy use in more sustainable directions and where *responsibility* and *agency* to affect that change lie.

Added to this, in the wake of the Paris Agreement and the IPCC's Special Report (2018) on the impacts of global warming, there is renewed attention to the question of the speed and scale of change, given that keeping within a 1.5°C rise will entail halving greenhouse gas (GHG) emissions by 2030. Published in autumn 2018, adopting language more associated with radicals and revolutionaries, the IPCC, often criticised for being cautious, called for 'transformative systemic change' to achieve the goals of the Paris Agreement (IPCC, 2018). It indicated the need for change across all sectors and regions of the world at unprecedented speed and called for behaviour change by all actors, alongside demand-side management, as crucial elements of this transformation. This message was underscored by the 2020 UN Emissions Gap report, which

included a dedicated chapter on the role of equitable low-carbon lifestyles for the first time in the report's history (UNEP, 2020).

New ground has also been broken with the *1.5-Degree Lifestyles: Targets and Options for Reducing Lifestyle Carbon Footprints* report, which makes for sobering reading (Akenji et al., 2019). The study assessed GHG emissions-reduction potential by looking at lifestyle carbon footprints, defined as emissions both directly and indirectly induced from household consumption. It highlights the need for reductions of over 90 per cent in GHG emissions by 2050 from today's lifestyles. This implies per-person carbon footprint targets of 2.5 (tCO2e) in 2030, 1.4 by 2040, and 0.7 by 2050. To put these figures in context, allowing for differential impacts and uneven historical responsibility, this means footprints in developed countries will need to be reduced by between 80 and 93 per cent by 2050, assuming that actions for a 58–76 per cent reduction start immediately to achieve the 2030 target. Yet, even for developing countries, the report highlights the need to reduce footprints by 23–84 per cent, depending on the country and the scenario, by 2050. These required emission reductions obviously reflect very different starting points in terms of existing levels of consumption.

Despite its huge potential, sustainable behaviour change has not traditionally been given high priority in climate policy strategies and is often downplayed in debates about mitigation. In the international climate policy arena, it has often been neglected and overshadowed by a focus on technology and market mechanisms. This has side-lined a greater focus on changing consumption and demand-side options. We argue instead that we need both 'arms of the scissors' to achieve change at scale: limits on *supply* (of fossil fuels) and drastic reductions in *demand* (where behaviour change has an important role to play) (Green & Dennis, 2018). The idea that sustainable behaviour requires changes at both the individual and political levels and that these two areas are not only linked but also reinforce one another is slowly gaining traction (UNEP, 2020; Leventon et al., 2021). The 2019 *1.5-degree Lifestyles* report states: 'the sheer magnitude of change required for a shift towards 1.5-degree lifestyles can only be achieved through a combination of system-wide changes and a groundswell of actions from individuals and households' (Akenji et al., 2019).

Lifestyles can be targeted 'from above' through policies and attempts to shape infrastructures and choice architectures, as well as emerge organically 'from below' from autonomous actions on the part of civil society and households. This implies a combination of cultural change and shifting social norms, alongside interventions by institutions and through the market as part of what we call a broad 'ecosystem of transformation'. It suggests the need for understanding pathways to change, which combine top-down and bottom-up, state,

market, and civil society-led transformations depending on the contexts in which they will be deployed (Scoones et al., 2015). The challenge of governing, steering, and coordinating behaviour change through these different pathways and via these different intervention points should not be underestimated and requires further attention from scholars of politics, international relations, and earth systems governance.

The recent turn towards behaviour change by international bodies is to be welcomed. In their 1.5°C report published in 2018, the IPCC noted with 'high confidence' that 'pathways that include low energy demand . . ., low material consumption, and low GHG-intensive food consumption have the most pronounced synergies and the lowest number of trade-offs with respect to sustainable development' (IPCC, 2018: 21). Likewise, in the latest World Energy Outlook, a scenario for primary energy demand imagines falls of 17 per cent between 2019 and 2030, even though the global economy is projected to be twice as large where 'electrification, efficiency gains and behaviour changes are central to achieving this' (IEA, 2020). The 2020 UN Emissions Gap report, meanwhile, calls for 'reforming consumption behaviour', noting that although

> two-thirds of global emissions are linked to private households, when using consumption-based accounting . . . The wealthy bear the greatest responsibility in this area. The combined emissions of the richest 1 per cent of the global population account for more than twice the combined emissions of the poorest 50 per cent. This elite will need to reduce their footprint by a factor of 30 to stay in line with the Paris Agreement targets. (UNEP, 2020: xxiv, xiii)

Given the scale and depth of required change in behaviours across society, but most especially among richer and more powerful social groups, it is unsurprising that politicians are not clamouring to reflect on, let alone act upon, the political, economic, social, and cultural implications of this. As President Bush Snr. famously stated at the Rio conference back in 1992, 'The American way of life is not up for negotiation'. Yet we present the case in this Element that it is a way of life increasingly emulated and pursued the world over that very much needs to be re-negotiated if further climate chaos is to be avoided.

Incremental transitions in the provision of services around energy, food, or transportation are no longer up to the scale of the challenge (Bataille et al., 2016; Zhang & Zhang, 2021). Deep decarbonisation across all sectors of the economy and wider social transformations are now required. With regard to behaviour change, this implies steering dramatic change across energy, food, and transport systems, where traditional governance systems often have limited direct reach and where powerful incumbent actors seek to preserve the status quo, as scholars of earth system governance increasingly recognise (Biermann, 2020).

Coordinating change within and across societies – and doing so in ways that account for significant inequalities – presents an unprecedented challenge for humanity. Perhaps most significantly, successfully addressing this challenge means countering the dominant organisation of the political economy in relation to income, work, and wealth generation and consumption. It touches, in other words, on the core of how capitalist economies are run.

For this reason, as we will explore in Section 3, existing scholarship is only partially helpful in understanding and engaging with these dynamics. Literature on behaviour change is often siloed into individual approaches to behaviour change (from economics and psychology) or more systemic approaches (from sociology and political economy): a divide we seek to bridge by exploring the interrelationship between individual and system change. Studies that model 1.5-degree compatible lifestyles (Akenji et al., 2021) are often technical in nature and have yet to explore the political and social challenges of enabling sustainable lifestyles. Despite a growing academic literature on behaviour change from economics (Thaler & Sunstein, 2009), sociology (Shove et al., 2012), psychology (Whitmarsh, 2009; Kasser, 2016), science and technology studies (Dubois et al., 2019), and politics (Princen et al., 2002; Dauvergne, 2008; Fuchs et al., 2016), there has been less attention to the question of scalability: key points of leverage and traction that bring about shifts of the scale and speed required to tackle the climate emergency.

How Important Is Behaviour Change?

Where behaviour change should sit within this broader landscape is subject to dispute, despite growing acceptance of its importance and potential impact in policy circles. Many recognise that it is an important dimension of responding effectively to the urgent threat of climate change, but views are often sharply divided on its significance relative to other drivers of emissions, such as energy infrastructures, for example, as well as on how to successfully initiate and sustain such shifts in behaviour across different contexts simultaneously. On the one hand, there are those who see it as a key site of change both in terms of direct and indirect effects on emissions from households' consumer choices, and more broadly in terms of the licence it gives governments and businesses to be more ambitious in their climate policies (Capstick et al., 2015; Dubois et al., 2019). On the other, there are real concerns about placing the burden for societal change on individual shoulders, where agency is often limited, and scapegoating can lead to backlash, disengagement, and denial, rather than positive engagement from citizens (Shove et al., 2012; Weintrobe, 2013). Indeed, individualising responsibility overlooks the huge inequalities in emissions

between and within countries, where the lifestyles of the most affluent have a disproportionate impact, as we explore in Section 2.

There is also significant disagreement about how best to scale behaviour change. Government policy, economic incentives, and broader cultural change all have a role to play. But can they achieve the scale of change in the short term within which 'transformative action' needs to take place to meet the goals of the Paris Agreement? In climate and broader sustainability terms, some behaviours matter more than others. Carbon footprints are closely correlated with income levels, highlighting the need for targeted, differential, and contextualised strategies within and between societies and the adoption of strategies that simultaneously address wealth and inequality. Tools, strategies, levers, and entry points, to be effective, must recognise important cultural differences, uneven capacity to affect and enact change, and very different levels of responsibility. There are few one-size-fits-all solutions to delivering change at this scale across and between divided and unequal societies. Multipronged approaches are required across different sites and scales of governance. Robust evidence on the role of behavioural change in societal system transformations and empirical evidence of effective leverage points for societal change are needed to guide high-impact and scalable interventions from a range of actors for rapid changes towards sustainable human development. Yet clearly attributing agency and responsibility is a fraught and controversial exercise, and different parameters and benchmarks generate very different estimates about behaviours and the scope to change them.

Underlying the case for a bottom-up, behaviour change approach is the argument that a significant proportion, if not the majority, of emissions is ultimately derived from the consumption choices of individuals. For example, according to some estimates, households are responsible for 72 per cent of global GHG emissions as a result of their consumption behaviour (Hertwich & Peters, 2009). Ivanova et al. similarly show that around two-thirds of global GHG emissions are 'directly and indirectly' related to household consumption, where the global average is about 6 tCO2eq/cap (2020:1). An interdisciplinary study of 17 action types concluded that the implementation of the most successful behavioural programmes could reduce household carbon emissions in the USA by 20 per cent, an amount equal to the total annual emissions of France (Dietz et al., 2009). Measures such as avoiding eating meat or reducing air travel alone can bring about savings of as much as 15 billion tonnes (gigatons) by 2060 (Cafaro, 2011).

Focussing on low energy demand pathways, Grubler et al. explore an alternative mitigation scenario that includes lifestyle changes, accelerated adoption of renewable energy, agricultural intensification, and lab-grown meat (2018).

These reduce overall energy demand by 40 per cent from today's levels, which in turn reduces the burden on overall supply and makes it possible to reach the 1.5-degree target – as well as sustainable development goals (SDGs) – without the need to rely on negative emissions technologies (Grubler et al., 2018). Furthermore, van Vuuren et al. found that by combining lifestyle change, reduction of other greenhouse gases, and rapid electrification through renewable energy, it was possible to reduce, but not eliminate, the use of carbon dioxide removal (CDR) technologies (2018). From this perspective, individual behaviour undoubtedly drives both energy-intensive lifestyles and a large share of global carbon emissions and is also a potential source of large, low-cost emission reductions (Stern et al., 2016). This makes it a critical factor in achieving the 1.5°C goal under the Paris Agreement.

Others are more critical about such estimates because they include the entire lifecycle of the consumption of goods and services, from cradle to grave, and give consumers full responsibility for emissions, regardless of whether or not they are actually in a position to influence the supply chain and production process. The effect is to allocate a much higher share of environmental impacts to households than they will be able to actively influence. Yet, despite their limitations, these estimates do inform climate action plans. A report by Williamson et al. (2018), building on the earlier 'Drawdown' plan (2020), identifies and ranks 30 (of the original 80) 'Drawdown recommendations' that are dependent upon behaviour changes at the individual level. They categorise the recommendations into four domains: food, agriculture and land management, transportation, and energy and materials. The top recommendations include (1) reducing food waste, (2) plant-rich diets, (3) electric vehicles, and (4) rooftop solar. When taken together, it is estimated the thirty actions could mitigate 19.9 to 36.8 per cent of global emissions between 2020 and 2050 (Williamson et al., 2018). The *1.5-Degree Lifestyle* report also emphasises reducing meat and dairy consumption, switching to non-fossil-based energy, and reducing car use and air travel, and calculates that when combined, food, housing, and transportation comprise approximately 75 per cent of total carbon footprints (Akenji et al., 2019). While these studies point to the huge potential of behaviour change to achieve the aims of the Paris Agreement, the means of realising these potential contributions are less well understood.

A policy can affect such change through a range of tools that include regulation, the provision of infrastructure, market mechanisms and financial rewards (Hardman et al., 2017), and public-facing information campaigns targeted at a range of sectors. For example, this will include support to more plant-based diets, given that the report makes clear that livestock are responsible for more GHG emissions than all other food sources (up to 14.5 per cent

of global GHG emissions). Globally, savings of carbon dioxide (CO_2) equivalent of between 29 and 70 per cent are possible by moving towards a more plant-based diet including measures aimed at reducing the demand for meat and other livestock products, bringing other co-benefits such as reducing consumption in line with human health guidelines (Willett et al., 2019). Likewise, efforts to reduce food waste need to be stepped up given the climate impacts of food production, of which a third currently gets wasted (FAO, 2011, 2019).

For industry, depending on the industrial sector, mitigation consistent with 1.5°C would mean a reduction of final energy demand by one-third, an increase of the rate of recycling of materials, and the development of a circular economy (IPCC, 2018: 335). There remains huge untapped potential to realise gains in energy efficiency and energy conservation. In the transport sector, for example, pricing and regulatory policies have successfully brought about change in places as diverse as Singapore, Stockholm, and London, where car ownership, car use, and GHG emissions have all been reduced (IPCC, 2018: 366). Notably, positive momentum can be brought about as co-benefits around health, air quality, and financial savings become apparent.

The debate about behaviour change often gets narrowed down to individual actions or what critics refer to as the individualisation of responsibility (Maniates, 2001). The parameters of what counts as a sustainable lifestyle are, therefore, contested. Getting a clear metric is a challenging task. At the level of principles and aims, Akenji and Chen (2016: 3) suggest, 'A "sustainable lifestyle" is a cluster of habits and patterns of behaviour embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of wastes, while supporting fairness and prosperity for all'. In Section 2, we discuss a range of approaches from 'One Planet Living' to sustainable consumption corridors, many inspired by the need to 'shrink and share': establishing upper limits on consumption and minimal thresholds to ensure the developmental needs of all are adequately met. This is not just about climate change, therefore, as efforts to radically decarbonise through behaviour change need to be cognisant of their impact on other environmental problems such as biodiversity loss, waste, and water pollution, where a narrow focus on decarbonisation may obscure unintended consequences if a more holistic approach is not taken. This might be the case, for example, with regard to the electrification of transport (without considering the intensification of mining for lithium and cobalt) and moves to plant-based diets (if pursued through monoculture industrial agriculture), for example, while noting that a failure to tackle climate change will render most SDGs impossible to achieve.

Although behaviour change is often assumed to be voluntary, we need to constantly recognise the changing circumstances that give rise to it where an appreciation of socially bounded agency and context is critical. The responsibility for societal transformations cannot be put on the sum of all individual shoulders. Such transformations can only be achieved when embedded in sustainable systems change, integrating shifts from individual values and community behaviour with societal changes in institutions and governance. It is choice architectures and systems of provision that are key. Indeed, the role of behavioural and value change provokes mixed reactions in environmental debates. Mary Heglar puts it bluntly,

> The belief that this enormous, existential problem could have been fixed if all of us had just tweaked our consumptive habits is not only preposterous; it's dangerous. It turns environmentalism into an individual choice defined as sin or virtue, convicting those who don't or can't uphold these ethics . . .. While we're busy testing each other's purity, we let the government and industries – the authors of said devastation – off the hook completely. This overemphasis on individual action shames people for their everyday activities, things they can barely avoid doing because of the fossil fuel-dependent system they were born into . . . Fight the oil and gas industry instead. (Heglar, 2019)

Even advocates of the significance of individual and household behaviour change recognise the limits of approaches that rely on that strategy alone. Dubois et al. suggest that 'short term voluntary efforts will not be sufficient by themselves to reach the drastic reductions needed to achieve the 1.5°C goal; instead, households need a regulatory framework supporting their behavioural changes. But there is also a mismatch between the roles and responsibilities conveyed by current climate policies and household perceptions of responsibility' (2019: 144). This reinforces our central argument about the importance of challenging these binaries and linking individual and system change as part of ecosystems of transformation.

Despite this, many policy approaches embody this disconnect and are built upon what Shove calls 'ABC' models of behaviour change (Cabinet Office, 2011), in which attitudes (A), drive behaviour (B), and hence choices (C) (Shove, 2010). Typically, 'individuals do not consciously decide to emit carbon. Rather, emissions are associated with the practices and routines of everyday life, from cooking to travelling' (Newell et al., 2015: 527). The routines of daily life are often embedded in the use of technologies, materials, and systems, which individuals have little power to alter, and that create a degree of lock-in (Unruh, 2000). This means going beyond 'expressions of individual preference and choice' to open up discussions about the very definition of 'taken for granted needs and the different means by which warmth and welfare, freedom and

mobility, and economic and energy security might be achieved in different settings' (Newell et al., 2015: 527). The generation of demand and desire, everyday routines and practices, and the ways these are sedimented by regulations, social pressure, and built infrastructures all require greater attention.

Influencing Behaviour Change

Over the last three decades, there has been a plethora of initiatives targeted at individuals and households aimed at shifting behaviours to address the climate crisis and other sustainability challenges. Strategies by governments, corporations, and non-governmental organisations have included regulatory measures, market mechanisms, and interventions aimed at shifting behaviours and norms through education and public information campaigns, for example.

Yet gaps remain in our understanding of the complex ways in which individual behaviours are influenced and which interventions work best, which different disciplines have sought to fill using a broad range of methods and theories (which we explore in Section 3). As Vandenbergh and Sovacool (2016: 93) put it: 'A recent renewed focus on individual behaviour reflects the growing recognition that additional emission reductions from large, industrial sources would be expensive and inadequate to achieve many pollution standards and that individuals often contribute more emissions than the industrial sector, if viewed as a discrete source category'. It also flows from growing understanding of the influence of norms on environmental behaviours (Carlson, 2005; Doherty & Webler, 2016). This, more socially informed analysis, of everyday decision-making departs from and challenges conventional accounts of economic rationality (Vandenbergh & Sovacool, 2016). It strengthens an appreciation of social context by emphasising things like the size of the home and the demographics of who lives there (Tukker et al., 2010; Sovacool et al., 2018), the different key phases of life when particularly significant household decisions are made, such as when having children or retiring, and the role of regulation in supporting households in going beyond short-term voluntary actions (Dubois et al., 2019: 144; see also Girod et al., 2014).

Recognising the pace and scale of the sustainability transitions now required, this is a key moment to consolidate knowledge, evidence, and insights about the role of behavioural change in contributing to societal system transformations. It is also an opportune moment to contextualise and globalise the conversation about scaling behaviour change across cultures and regions and to look at the interface with different social cleavages and dynamics such as race, class, and gender. The focus to date has been on behaviour change in richer societies for obvious reasons relating to their higher carbon footprints and historical