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# Expanding the policy menu: how demand-side interventions can help the UK reach net zero

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COMMUNICATION | EDITORIAL | INVITED CONTRIBUTION | **PERSPECTIVE** | REPORT | REVIEW

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## ABSTRACT

Public concern about anthropogenic climate change has grown over the last decade, and world governments have ramped up efforts to meet the challenge. The United Kingdom recently pledged to reach net zero carbon emissions by 2050. While ambitious mitigation goals indicate the right intentions, the target's success depends on the efficacy of the government's climate policies. National and international climate strategies are dominated by research into low-carbon energy sources, and programmes to charge large emitters. These strategies have solid foundations in economic theory but are hamstrung by slow rates of diffusion of new technologies and industry opposition to carbon taxes. Drawing on the increasing public support for drastic climate action, policymakers should implement interventions that focus on reducing consumers' demand for energy and other carbon-intensive products. These consumer-facing policies would enable meaningful individual action, complement existing climate interventions and widen the government's avenues to net zero.

## Introduction

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A recent study, co-signed by 11,000 scientists, warns that our planet is facing a climate emergency [1]. To avoid disaster, they recommend an immediate and significant reduction in global emissions. Last year the United Kingdom legislated a target of net zero emissions by 2050. However, current policies neglect the abatement potential of demand-side changes. Like most countries across the world, the UK's core climate policy focus is threefold. First, research funding stimulates innovation in breakthrough low- or no-carbon technologies. Second, deploy-

ment of low-carbon technologies, such as off-shore wind energy and electric vehicles, is encouraged with subsidies and tax breaks. Finally, a carbon pricing scheme aims to charge emitters for the environmental harm they create. All three branches of current climate policy address how upstream producers of goods, services or electricity – the 'supply-side' - can reduce their emissions. Alternative policies aim to change consumption patterns – the 'demand-side'. Figure 1 compares supply-side and demand-side policies. In order to create enough mitigation to meet climate scientists' call to action [2], UK climate policy should

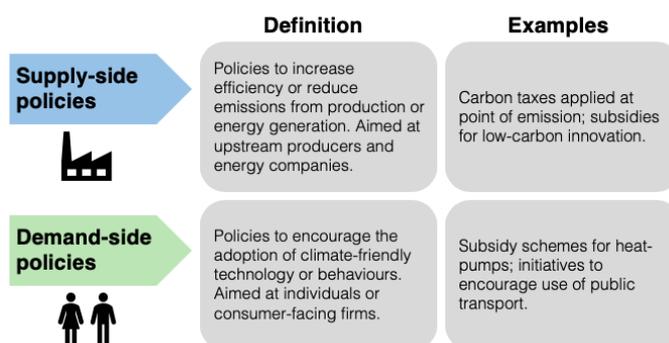


Figure 1: Definitions of supply-side and demand-side policy interventions. Note that some authors take a different definition of supply-side policies (eg, Hoel [3] defines supply-side as pertaining only to the supply of fossil fuels, rather than the use of fossil-fuels by manufacturers and producers).

utilise demand-side policies to reduce the emissions burden.

## So far, so supply-side

To date, the UK's carbon policy primarily addresses how the supply-side can reduce its climate impact. In particular, low-carbon innovation dominates headlines and soundbites. However, the potential for new technologies to stop climate change is hampered by the time delay between invention and widespread use. Most innovations - particularly energy technologies - take decades to go from prototype to market-ready [4]. Instead, ambitious deployment of existing low-carbon technologies could reduce our reliance on polluting fossil fuels relatively quickly [5]. Green energy sources such as wind and solar are a key component of this strategy. While they are usually more expensive than their dirty equivalents, prices have fallen faster than expected in the last decade [6]. Nonetheless, widespread uptake of renewable energy requires extensive changes to the electricity grid to accommodate intermittent generation [7], which we can expect to be slow and pricey. Smil [8] has shown that previous large-scale transformations of the energy market have taken three to five decades. In order to meet climate targets, a grid-scale energy transition would need to happen faster than ever before [9]. Energy needs might be reduced by improving current technology and processes in industry and manufacturing. It has been proposed that better allocation of energy and materials in manufacturing could save both money and emissions [10].

However, a large body of literature casts doubt on the existence of these win-win industrial efficiencies. Allcott [11] suggests that business-side barriers, such as insufficient information about potential energy savings, prevent these seemingly free gains.

Charging emitters for their environmental impacts boosts incentives to decarbonise [12]. A carbon price can be imposed using direct taxes on emissions, or permit trading schemes where a regulator sets a cap on total emissions by allocating allowances to emit. Firms can trade permits: the resulting permit price is the carbon charge [13]. The world's largest carbon pricing scheme is the European Union's Emissions Trading Scheme (EU ETS) [14]. The UK has taken a reasonably proactive stance on carbon pricing by implementing a price floor that boosts the level of the EU ETS [15]. However, the current price floor of £30 per tonne of CO<sub>2</sub>-equivalent gases is still far off the true environmental cost of emissions, which most experts agree is between £60 to £80 per tonne of CO<sub>2</sub> [16]. Some estimates put damages even higher - at more than £300 per tonne of CO<sub>2</sub> [17] (see Figure 2). Implementing higher carbon prices is difficult. Voters are justifiably concerned that carbon prices disproportionately affect low-income people [18]. Moreover, industrial stakeholders lobby against taxes that cut into their profits [19]. Already, subsidies in carbon-heavy industries like steel have been shown to reduce the effective carbon tax rate by up to 95% [20]. The result is a carbon price that has negligible impact on industrial profit margins and generates insufficient motivation to achieve meaningful emissions cuts.

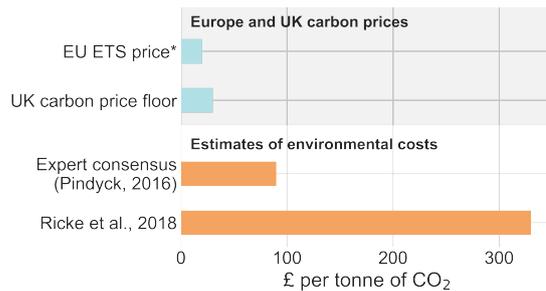


Figure 2: The price of carbon in Europe and the UK compared to estimates of the cost of carbon emissions. \* EU ETS price as of 6 January 2020. Sources: [21]; [15]; [16]; [17].

The UK government should leverage the economic power of demand. Demand-side policies would complement carbon taxes and change commercial incentives of heavy emitters. The last 30 years of climate policy have shown that the traditional supply-side mechanisms are not enough to achieve required emissions cuts. Moreover, the worldwide dominance of these policies has eclipsed other policy options [22]. A coalition of civil societies go further, arguing that the focus on carbon pricing narrows the vision of domestic and international policy negotiations [23]. Subsidies for low-carbon innovation and carbon taxes remain necessary. However, they should be implemented alongside policies that enable individuals to influence carbon-producing activities. To achieve its net zero ambitions, the UK needs to utilise both supply-side and demand-side interventions.

## Turning to demand

Climate policies have mostly addressed emissions reductions that don't affect final consumers [2]. Allowing for policies that require meaningful public engagement would hugely expand the policy menu. Demand-side policies encourage changes in how people use energy or purchase goods (see Figure 1). They can encourage environmentally-informed decisions such as lowering the thermostat or buying smaller cars. Policies designed to influence individual choices can be controversial, but governments can achieve meaningful change by capitalising on societal pressure for climate action. Opportunities already exist. Flight-shaming, or flygskam, the social movement that discourages flying, has already prompted

Swiss bank UBS to halve their estimate of next year's global aviation growth based on passenger surveys [24]. Social movements like flygskam offer governments a chance to entrench change by incentivising carbon-friendly choices, such as stay-cations or train travel. Demand-side climate policies can have far-reaching impacts on society. The impacts are positive when emissions-saving choices have non-environmental benefits, or 'co-benefits'. Financial co-benefits of environmental policies exist when efficiency gains yield cost savings. Demand-side policies can also yield improvements in health and lifestyle. For example, urban planning laws that allow for higher-density housing in central boroughs slow urban sprawl, resulting in fewer driving hours and healthier transport options [25]. A wide-scale shift to low-meat diets would have health co-benefits [26]. However, climate policies can also have undesirable impacts. Careful thought must be given to the impact of demand-side policies on disadvantaged groups, especially if policies make carbon-intensive necessities more expensive. Lessons can be taken from previous unsuccessful interventions. The French government's plans to increase carbon taxes on diesel fuel sparked the 'gilet jaunes' movement in 2018. The tax hike would have disproportionately affected poorer rural residents, who tend to drive further distances and drive diesel cars [27]. After three weeks of violent protests, the French government abandoned the tax increase.

The gilet jaunes movement highlighted the risk of imposing climate solutions with uneven social impacts. This lesson is particularly pertinent for price-based policies: low-income households cannot absorb price increases, so would have no choice but to cut back consumption. Whitmarsh [28] suggests that demand-side policies should retain individuals' sense of agency and help them translate their values to behaviour changes where possible. Using non-price levers for low income households might be a way to nudge them towards climate-friendly decisions without adding excessive financial burden. By their nature, demand-side interventions will affect people's lives in more ways than just their climate footprint, whether that is improving their health or increasing their cost of living. These social side effects - both positive and negative - should be emphasised and quantified in climate policymaking in order to

maximise the benefits and minimise the risks of demand-side policies.

Alongside changes in individual decision-making, another avenue for change is through climate-friendly businesses. Social change is usually seen as top-down or bottom-up. However, research suggests putting more emphasis on the middle-out role of professionals and practitioners [29]. The middle-out perspective rests on individual action from within organisations to create and facilitate social change. For example, industry group Investment Property Forum considers how to drive investment in energy efficiency improvements in rental homes [30]. They recommend that property managers encourage the use of ‘green leases’, which share cost savings between tenants and owners. Some firms facilitate change by encouraging employees to participate in climate demonstrations. Several companies, including Patagonia, Lush and Burton, shut stores to allow workers to join the Global Climate Strike in September 2019 [31]. Other proposals include initiatives to enable engineers to design buildings with less carbon-intensive materials [29], or encouraging climate-friendly car fleet managers to adopt electric vehicles [32]. Middle-out change from firms and practitioners complements demand-side initiatives, and could help cement a rethink in the approach to climate mitigation.

Demand-side climate policy would reduce future mitigation requirements from as-yet-undeveloped technology, and could be deployed relatively quickly. The diffusion rate of demand-side mitigation policies is under-researched. Qualitative studies suggest that societal transitions can be non-linear – social tipping points can drive sudden transformations in beliefs and behaviours [33]. For climate change, these non-linearities mean that demand-side mitigation may propagate much faster than supply-side interventions [34]. The UK government can look to other countries for demand-side success stories. Norway’s electric vehicle policy, most of which was rolled out in the last 20 years, makes it cheaper to own an electric vehicle using tax breaks and lower registration fees. The policy has proven successful; 40% of cars sold in 2017 were fully electric [35]. Transport accounts for a third of the UK’s total emissions [36]; encouraging electric vehicle purchases is a key avenue to tackle this sector.

The UK government could achieve meaningful and timely demand-side mitigation by applying lessons from international case studies.

## The time to act is now

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The 2050 net zero target requires broadening the policy remit, and there is no better time than now. Current policies generally focus on the companies that emit, but emissions reductions would be swifter if policy also covered the individual decision-makers who drive demand. Climate protesters are walking out in the millions [37]; environmental vegetarianism is on the rise [38]; more people are avoiding carbon-intensive flying [24]. Policymakers need to capitalise on the increasing social frustration at stalled climate action to push through policies that would have been unthinkable a decade ago. In particular, the strategies they pursue should enable individuals to use their own influence, as consumers, voters and workers, to lessen their country’s impact on the environment.

The UK’s current mitigation strategies of innovation support and carbon pricing have achieved some emissions reductions, but the government needs society’s help to meet the mitigation needs of the 21st century. Figure 3 shows UK emissions have fallen 37% since 2000 [36], driven mostly by supply-side savings. However, the impact of current policies is curtailed by long innovation timelags and industrial barriers to tax. Traditional mechanisms cannot be relied on to achieve the emissions savings necessary to avoid serious climate damages. Policymakers must consider unconventional alternatives. Policy can play a role in prioritising the changes in behaviour that can have the most impact. The Committee on Climate Change’s report that prompted the 2050 net zero target briefly discussed how citizens could effectively contribute to mitigation by making climate-conscious choices, such as moving to mostly plant-based diets [39]. Discussions on the most effective methods to create demand-side change must be more highly prioritised in climate policymaking.

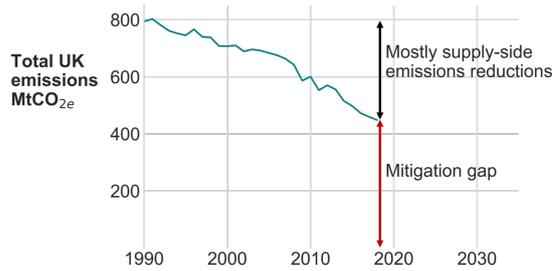


Figure 3: UK emissions since 1990. Source: [36]

Up until now, the UK has pursued climate policies that do not affect the majority of their voters. Policymakers underestimate people's desire for meaningful climate action. Societies have been spurred into change before, albeit at a smaller scale. Nuclear testing in the South Pacific was banned after galvanising protests [40]. Ozone depletion ceased after outcry from scientists [41]. Climate movements – from school walkouts to Extinction Rebellion – indicate a growing policy gap between society's desired climate action and what has been implemented so far. Policymakers must fill that gap with new policies that enable individuals and businesses to make climate-conscious choices. Interventions that reduce energy demand will complement existing price mechanisms and cut emissions. Policymakers must look to the people if the UK is to achieve net zero carbon in 2050.

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