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What Has Been Done to Reduce Luxury Consumption? A Global Review

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Abstract

To date, international diplomacy and policy development around emissions reduction focus largely on the difference between high-emitting and low-emitting countries. Overwhelming evidence across several countries shows a strong relationship between income, wealth, and emissions within countries. A nuanced exploration of emissions shows evidence of a great disparity across classes and income within high-, middle-, and low-income countries. As the window for opportunity to limit warming to 1.5°C closes, addressing luxury emissions may represent a high-impact mitigation strategy for two reasons: They represent a substantive proportion of emissions, and they serve as an aspirational model for other consumption classes, thus amplifying their destructive effect on emissions and the planet. However, there is limited understanding of the patterns of luxury consumption and thus the policies and regulations that can directly target these behaviors. This review leverages best available literature to explore the following questions: (*a*) What are the patterns of consumption between income classes within and across regions—are there commonalities in luxury consumption of the richest populations across regions? (*b*) Is there evidence of policies or instruments that have targeted reducing emissions-intensive consumption? (*c*) What are the initiatives or policies that shift such consumption toward less emission-intensive ones?

Here, we identify four types of actions: (*a*) economy-wide actions and policies, including ambitious taxes and pricing instruments that address emissions-intensive consumption and investments; (*b*) measures targeting specific luxury consumption associated with higher income and wealth, such as flights or meat consumption; (*c*) measures that educate and encourage behavior change among individuals that can influence change (as investors, individual consumers, or influencing role models); and (*d*) societal measures to reduce inequality and promote well-being. Constraints to adopting these include lack of political will due to fear of public resistance, power structures within society, and resistance of the elites to changing the status quo. Other barriers include cultural norms, ideology, and habits that can often supersede environmental concerns, making it difficult to achieve success in the short run. However, emerging evidence shows countries and organizations are implementing a range of measures, including taxes, bans, guidelines, and information instruments, toward addressing high-emissions activities. While it is early to comment on their success in reducing luxury emissions, some of these measures do seem to show evidence of a shift in consumption patterns.

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1. BACKGROUND

There is strong evidence and scientific consensus on the disproportionate contribution of countries and households with the highest income or wealth to greenhouse gas (GHG) emissions. Recent studies show that globally, the top 10% of individuals (ranked according to income, wealth, or emissions) contributed 45–49% of total global emissions, while the global bottom 50% emitted 7%–13% of the total (1–4). This group was also responsible for nearly one-quarter of the increase in global emissions since 1990. Their per capita emissions, averaging about 70 tons of CO_2 annually, are significantly higher than the average of 6 tons for the global population (5, 6). These individuals overall have a much higher consumption of energy and material goods compared with their middle- and low-income counterparts. They also tend to be individuals with high political and cultural influence (5), thus shaping social imagery consistently with their own consumption patterns.

Consumption of certain high-end goods, often referred to as luxury consumption, increases as income increases. Also referred to as dirty luxuries, these goods include large homes, multiple homes, sport utility vehicles (SUVs), luxury clothing, private jets, yachts, and more recent initiatives such as space tourism (7, 8). In particular, space tourism and the widespread use of private jets (owned personally, company owned, or leased) and yachts are a unique class of experiential or luxury recreation that can only be afforded by a tiny fraction of the population while generating a highly disproportionate amount of emissions (9). In addition, wealthy individuals also contribute significantly to emissions through investments in emissions-intensive companies and activities (10).

Luxury consumption: consumption primarily undertaken by high-income households; luxuries are a subset of normal goods whose income elasticity of demand is positive

Historically, global energy intensity [energy consumption per unit of gross domestic product (GDP)] has steadily decreased, while carbon intensity has only begun to decline since 2013 (11). However, these improvements have not been sufficient to offset growth in activity at a global level, resulting in overall increases in emissions. Between 2000 and 2022, building floor area has increased by about 70% and air passenger traffic has increased by 2.5 times, while SUVs made up nearly 48% of total car sales in 2023 (12–14). Structurally, the resulting inequality is a barrier to sustainable behavioral change (15).

According to the Global Wealth Report (16), people are progressively becoming wealthier globally. In 2022, the United States had the highest number of millionaires (22 million), followed by China, the United Kingdom, Japan, Germany, and France. A simultaneous trend in many countries is increasing inequality among different groups. Extrapolating from growth in wealth, the share of millionaires is projected to increase from the current 0.7% of the global population to 3.3% by 2050, resulting in projected cumulative emissions of more than 280 $GtCO_2$ (17), a sizable proportion of the available carbon budget for limiting global warming to 1.5°C.

While there are high emitters in all regions and countries, emissions of the high-income households in South and Southeast Asia and sub-Saharan Africa appear to be significantly lower compared with other regions (**Figure 1*b***) (2, 18). If emerging middle classes in developing countries mirror current western consumption patterns, the chances of stabilizing GHG emissions at safe atmospheric concentration levels will undoubtedly be reduced (19). This article synthesizes literature on emissions inequalities that relate to consumption. Such consumption has been referred to in literature as luxury consumption (20), status consumption (21), unsustainable consumption (22), and conspicuous consumption (23).

Two tasks are therefore necessary. First, the review unpacks the pattern of luxury emissions, which may help policymakers and other stakeholders to advance solutions. Secondly, the article investigates strategies toward reducing luxury emissions, focusing on literature on whether and how these have worked. Section 2 of the review discusses emissions inequalities globally between countries and regions. Section 3 discusses emissions inequalities within countries. Section 4 dives into the evidence on patterns of consumption and motivations. Sections 6 through10 discuss policies and instruments to address luxury consumption, including those targeting specific types of consumption, with Section 9 highlighting the role of different actors.

2. EMISSIONS INEQUALITIES BETWEEN COUNTRIES AND REGIONS

In 2024, the top GHG emitters were China, the United States, India, the European Union, Russia, and Brazil (6) (**Figure 1*a***). When seen in terms of historic contributions (1850–2023), the United States is the top emitter, accounting for 20% of the total emissions, followed by the European Union and China with 12% each. In contrast, the African Union, with 55 countries, contributed 7%, while the Least Developed Countries contributed 3% of historical cumulative CO_2 emissions (**Figure 1*a***) (6).

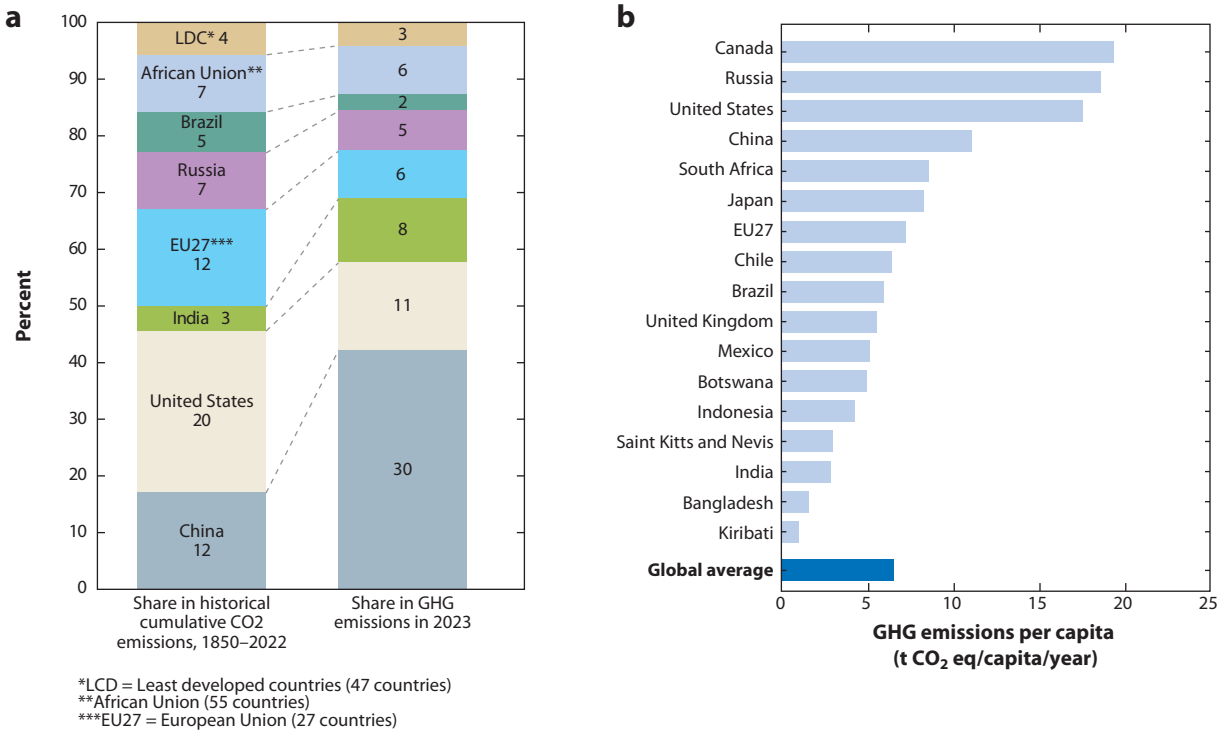

Figure 1

Current and historic contributions to emissions. (*a*) Percent share of greenhouse gas (GHG) emissions in 2023 for selected countries and regions and percentage share of historic CO_2 emissions 1850–2023. (*b*) GHG emissions in 2023 per capita for selected countries and regions. Figure adapted from Reference 6. Data from Reference 28.

However, during the past three decades, the pattern of growth has been changing, with China recording significantly higher rates of emissions growth between 1990 and 2023, while emissions in the European Union are relatively stable and declining in some countries.

Furthermore, per capita emissions also vary widely, with countries like Australia, Canada, Russia, and the United States having per capita emissions more than three times the global average, while China's annual per capita emissions are twice the global average of about 6.7 tons per capita. In contrast, the annual per capita emissions of India and Bangladesh, at 2.9 tons and 1.6 tons, are less than half the global average. Small island countries have much lower emissions footprints (**Figure 1*b***). Evidence also shows that countries in Europe and North America tend to have higher consumption-based emissions compared with production-based emissions; the opposite is true in emerging economies such as China, which implies higher imports in the former countries (24).

Similar inequalities can be seen in patterns of energy and material consumption. Based on normative considerations, material use in wealthy countries exceeds global fair shares. Studies on material use between 1970 and 2017 show that high-income countries, particularly the United States and European countries, are responsible for nearly 75% of the global excess material use, i.e., material use exceeding an equal fair share based on the country's population (25), while the rest of the Global South (excluding China) is responsible for 8% (26). Countries in the Global North consume approximately 130 GJ of energy annually per capita, while low-income countries use about 13 GJ per capita (26, 27).

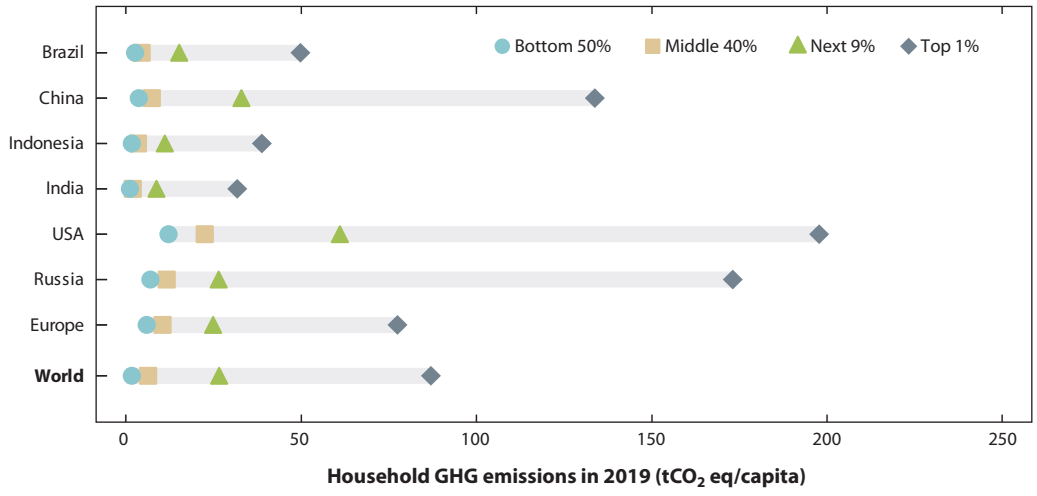

Figure 2

Household greenhouse gas emissions in 2019 showing per capita emissions for the top 1%, next 9%, middle 40%, and bottom 50% of households for selected countries. Emissions exclude land use, land-use change, and forestry emissions. Data from World Inequality Database 2023; figure adapted from UNEP Emissions Gap report 2023 (29). Abbreviations: GHG, greenhouse gas; UNEP, United Nations Environment Programme. In this figure, Europe refers to the weighted average of France, Germany, Italy, Poland, Spain, Sweden, and the United Kingdom.

3. EMISSIONS INEQUALITIES WITHIN COUNTRIES AND PATTERNS OF CONSUMPTION

Globally, the top 10% of the population contributed 45–49% of total emissions, while the bottom 50% contributed 7–13% of the total emissions (1–4). The carbon footprint also varies among countries within regions (1). These inequalities have been estimated using different approaches and data sets. However, it is clear that there exist large disparities in energy and resource consumption between wealthy and less wealthy households across regions and sectors (29).

Evidence associating high per capita or household emissions with high income and wealth inequality has been reported for Organisation for Economic Co-operation and Development (OECD) countries; high-income non-OECD countries; and several other countries, including the United States, New Zealand, China, India, Turkey, Mexico and Philippines (30–37). The emissions of the top 10% of households in the United States, Russia, and China are significantly higher than the global average (**Figure 2**). In the United States, the top 10% contributed about 40% of total national emissions in 2019 (38). This is mainly driven by larger homes, higher energy demand for residential heating and cooling, and private transport (31, 39). Consumption inequality is a reflection of income inequality, as data between 1980 and 2010 show that consumption inequality within the United States increased by the same level as income inequality (40).

A number of studies in China provide evidence on the relationship between income and wealth inequality and GHG emissions (41, 42). In China, the top 20% of urban residents, or about 10% of the population, were responsible for one-third of the capital-formation-related carbon emissions, while the lowest 20% of the rural residents (about 9% of the population) contributed only 2%. The study highlighted the capital and investments of high-income groups in China as a key factor (43). In Canada, Australia, and Korea, the top 10% of emitters contribute nearly half of the total emissions. In Latin American countries, the top 10% income category contributed 29% of the

regional total carbon footprint, and their per capita carbon footprint was more than 12 times that of the bottom 10% of earners in that region (44).

Nearly one-fourth of the growth in emissions during the past three decades (1990–2019) was driven by the top 1% globally (2). An assessment of carbon footprints across 43 countries between 2005 and 2015 showed the highest-income group in developed countries had made the least progress in reducing emissions, implying a resistance of the rich to lifestyle changes and sustainable consumption (45).

Disparities in emissions have been observed between rural and urban areas. In developing countries, carbon footprints in urban areas are higher than those in rural areas. In Europe, overall carbon footprints were 7% lower in urban households compare to rural households when controlled for household size and income; however, this was compensated by 6% higher average incomes in cities (46). The same study found variations within the regions. In Eastern Europe, emissions increased with the rate of urbanization, whereas a reverse trend was observed in some Western European countries. Wang & Yuan (47) analyzed household CO_2 emissions for 30 municipalities in China in 2017 linked to data on household consumption surveys and found that urban areas contributed nearly three-quarters of the total emissions in China. A study of consumption-based carbon footprints of 6 million US households between 2008 and 2012 found that the top 10% of households contributed a quarter of national GHG emissions, while the bottom 40% contributed only 20%. They also found that suburban areas and quasi-rural areas had the highest carbon footprints, mainly associated with higher incomes and inefficient housing and transport (32).

Consumption inequalities relating to household incomes have also been reported within cities. A survey of more than 900 households in Delhi revealed significant variations in floor area and electricity consumption across socioeconomic groups (48). The floor area occupied by the top 20% of households was 10 times higher than that of the lowest socioeconomic group. Similarly, a study of more than 1,900 households in Bangalore showed a significant variation in electricity consumption, ranging from 9 kW h/year to 2,337 kW h/year, where the increase in energy consumption was proportional to the increase in family income (49). Emissions reflect wealth inequalities that result from other societal inequalities. For example, African American households in the United States had lower carbon footprints compared with Caucasian households, as they lived in older homes and had lower rates of home ownership and less floor area per capita (50). In another study, after controlling for income, household size, ownership status, and city, black households in the United States had higher residential energy expenditures than white households, indicating a higher energy burden for the former group (51).

4. THEORETICAL UNDERPINNINGS—WHAT FACTORS INFLUENCE CONSUMPTION?

Veblen's theory of conspicuous consumption (52) has been discussed widely though critically by some researchers. Veblen argues that the high-income class tends to consume conspicuous goods and services for pretentious display for higher social status. The critics highlight the limitations of the theory's applicability to certain luxury goods and of the assumption that cultural influences percolate downward from the upper-income class (53). Subsequent theories linked consumption choices by households to the prestige these choices conferred to the owners (54). This was also evidenced in a household survey in India, where decisions around the purchase of cars and appliances were strongly linked to how households perceived themselves in society (55). Using political economy and the Veblen effect as a theoretical foundation, empirical analysis reveals a statistically significant relationship between CO_2 emissions and income distribution (56).

Boyce (57), a political economist, suggested that inequalities in power and income promote environmental degradation for three distinct reasons: (*a*) The additional environmental

degradation caused by powerful individuals is not balanced by the environmental destruction avoided by the other group (the poor); (*b*) inequality increases the value of the benefits received by the wealthy and powerful, while the expenses fall on the poor and less-powerful individuals because of the purchasing power differences, preference manipulation, and technological change pathways; and (*c*) inequality raises the rate of time preference applied to environmental resources by the poor and the rich, increasing their poverty and political insecurity, respectively. Literature has also highlighted other factors, including a perceived image of the self or status that is associated with luxury consumption, cultural norms, and habits.

Demir et al. (30) suggest that the environmental effects associated with inequality vary with the level of progress. The various influences herein might be attributed to the following two possibilities. First, the lowest-income households' greater marginal tendency for consumption could explain the relationship between income inequality and environmental degradation in developing countries. Second, the low-carbon economy approach and the increasing proportion of low-carbon investments might be responsible for the positive link between decline in income disparity and carbon emissions in developing countries, thus resulting in lesser environmental degradation.

Greater wealth concentrations at the top of the income scale lead to higher consumption competitiveness and longer work hours, resulting in higher energy consumption and emissions because wealthy individuals consume expensive, publicly viewable goods and services to gain social standing, while poorer families increase their expenditures to keep up with the evident lifestyles of wealthy individuals. In both cases, the consumption behavior affects the emission patterns (56). Psychological needs, such as positive self-perception or social recognition, could drive excess consumption (58).

An emerging trend is the increased reach of wealthy celebrity influencers, who create a certain lifestyle image from energy-intensive transport modes and luxury travel (59). This can have a significant influence on societal consumption patterns as a large section of their followers strives to emulate their lifestyle.

5. KEY FACTORS AND PATTERNS OF CONSUMPTION

The relationship between income inequality and per capita emissions depends on the level of income (60); however, other factors, such as socioeconomic status (SES) and status aspiration, are also relevant (5). GHG emissions of low- and middle-income households mostly originate from basic needs such as heating, cooling, and nutrition, while high-income households consume energy and materials more than the global standards. Other factors that can possibly influence consumption-based emissions include urbanization level, number of persons in a household, whether these include children and elderly people, educational attainment, and income elasticity of consumption (39, 61, 62). Interestingly, high-density urban areas, which can reduce the consumption-based carbon footprint, and education level were seen to have a mixed impact.

While underlying studies use diverse approaches, including using income or wealth data and household or individual consumption, there exist common elements in the consumption habits of high-SES individuals (including both income and status aspiration). These habits are characterized by large and multiple homes, frequent air travel, substantial residential energy, emissions-intensive mobility, and high levels of consumption of luxury goods and services. Energy use in high-SES households is higher not only due to larger living spaces but also because of higher ownership and use of energy-intensive appliances, specifically for heating and cooling. Similarly, transportation is characterized by more frequent flying and higher reliance on private transport, including frequent car travel and the use of large cars. For example, air travel alone constitutes more than 40% of

the carbon footprint for the top 1% in Europe. In Germany, the highest-emissions group and the lowest emissions group differed by a factor of 10, and the former had significantly higher emissions from heating, large cars, more frequent and longer holiday trips by car, and higher consumption of meat (63). Meat consumption, found to increase with increasing incomes, is currently higher in developed countries, and among high-income households in developing countries where dietary westernization is taking place (64). Travel, including car usage, personal airplanes, yachts, and vehicles for recreation, adds significantly to the carbon footprint of the elites. Barros & Wilk (65) estimated that there were 163,885.9 tons of CO_2e emissions from the top 20 billionaires in 2018. Yachts and other recreational vehicles contributed the largest share of these emissions (64.23%), followed by transportation (33.46%) (including on-road vehicles and air transport), while dwellings accounted for only 2.3% of their total emissions.

A study assessing the investment data (66) shows that the world's richest 125 billionaires emit 3 million tons of CO_2 annually (on average). That is around one million times the emissions from the bottom 90% of income earners. Billionaires own significant market capital in many influential organizations, giving them the flexibility and power to influence the operations of these organizations, employees, and customers. Evidence shows that between 1991 and 2014, high-net-worth individuals invested in agriculture in Latin America and Southeast Asia, resulting in an increase in cropland area and consequent loss of forest cover and biodiversity (67).

The conventional paradigm is that improving the lives of people requires higher consumption that is, in turn, driven by economic growth and increased production that requires materials and energy. Powerful actors, including high-income nations, large companies, and wealthy households and individuals, drive this dominant narrative. An alternative narrative focuses on providing services required for well-being for all, and is taken as a starting point, in slight variation, for a demand-side solution perspective and consideration of decent living standards (68–70). As those with high consumption tend to be equivalent to those with high cultural narrative shaping power (5), there is a self-reinforcing cycle that makes it challenging for alternative narratives to make leeway (**Figure 3*a***). However, high-SES individuals could alter the narrative in two ways. Firstly, by reducing their own carbon-intensive luxury consumption, they act as role models, influencing

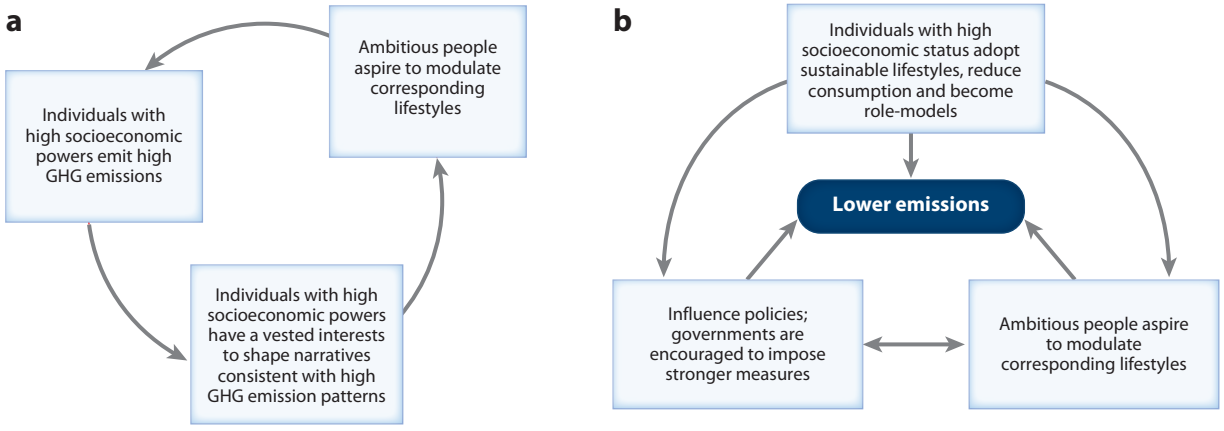

Figure 3

Consumption behavior in society is shaped by influential actors, sociocultural norms, and existing power structures. (*a*) As individuals with high–greenhouse gas (GHG) emission lifestyles coincide with those having high cultural power, aspirational high consumption patterns self-stabilize. (*b*) Individuals with high GHG emissions adopt sustainable lifestyles, becoming role models for the public and leading to a wider societal change.

change among the wider society. Secondly, they can influence structural changes through their investments and by influencing policies (**Figure 3*b***). The following section provides a review of the literature on policies and strategies to reduce luxury emissions.

High–socioeconomic status (SES) individuals: refers to an individual's position in the structure of a society; SES reflects access to both financial and social resources and includes social class

6. POLICIES AND INSTRUMENTS TO REDUCE LUXURY EMISSIONS

There are several good reasons to impose policies restricting luxury consumption or channeling luxury consumers to low-carbon items. Firstly, policy interventions that target upper-income groups offer the greatest opportunities for decarbonizing consumption (19). In addition to the obvious urgency of undertaking climate action amid a shrinking carbon budget, these interventions have also been advocated on grounds of morality, disproportional environmental impacts, and social justice (71). Moreover, high-SES individuals often act as trendsetters and cultural leaders (**Figure 3*a***), meaning their adoption of sustainable practices influences wider societal behaviors. Thus, engaging this demographic is crucial for achieving significant reductions in global GHG emissions and mitigating climate change. There is a wide range of strategies for addressing the high-emitter group that includes progressive carbon taxes, luxury taxes, incentives for sustainable consumption, and stringent regulations on high-emission activities such as frequent flying, high meat consumption, and owning multiple vehicles. These can be divided into four categories: (*a*) economy-wide actions and policies (including carbon taxes), (*b*) measures targeted at specific luxury consumption associated with higher income and wealth (such as flying or meat consumption), (*c*) treating individuals as change agents (as investors, individual consumers or influencing role models), and (*d*) societal measures to reduce inequality and promote well-being. These include regulatory measures, economic instruments, and other strategies such as providing information and raising awareness (**Table 1**). These categories are not mutually exclusive, and many measures may overlap and could also be complimentary.

To address the disproportionate impact of high-SES individuals on GHG emissions, effective policy measures can target these differential consumption patterns. For instance, policies, such as those for the housing and mobility sectors, can be more balanced when they consider the differences in GHG emissions within the income classes (72).

7. REDUCING STATUS CONSUMPTION WITH TAX INSTRUMENTS

Robert Frank's extensive work on taxing status consumption, particularly through his books such as *Luxury Fever* and *The Darwin Economy* (73, 74), provides a detailed framework for addressing the externalities of conspicuous consumption. Frank argues that status-driven consumption leads to expenditure cascades, where individuals feel compelled to spend more to maintain their social standing, resulting in inefficiencies and increased environmental impacts. To counteract this, he proposes a progressive consumption tax that specifically targets high-end consumption without penalizing savings and investments.

A tax on luxury goods, implemented at purchase, could make luxury goods less attractive thereby deterring consumption, spur innovation toward lower emissions alternatives, generate revenue that can be used to support clean initiatives and promote equity by getting wealthier populations more for their emissions. However, these benefits depend on various factors such as the scope and rate of tax, elasticity of demand and enforcement (75).

A progressive consumption tax works by taxing the difference between income and savings, thus only taxing what is spent. Higher rates are applied to higher levels of consumption, which disproportionately affects the spending habits of high-SES individuals who drive luxury markets. By making status goods more expensive through higher taxation, the incentive to engage in conspicuous consumption diminishes. This not only curbs unnecessary consumption but also redirects

Table 1 Policy instruments aimed at reducing greenhouse gas emissions of the top emitters globally

Policy instrument	Description	Category	Example of where implemented	Potential adverse side effects and strategies to reduce these	Potential impact (high/medium/low)	Evidence of emissions reductions
Progressive carbon tax	Tax on carbon emissions, with higher rates for higher emissions	Economy-wide action	Canada, Sweden	Economic burden is imposed on lower-income households if not balanced by rebates. Public acceptance is improved by providing public information, channeling revenues to environmental projects, and reducing distributional impacts.	High	In Sweden, emissions were reduced by 11% from 1990 to 2005 while GDP grew (95).
Wealth tax with environmental surcharge	Tax on net wealth with an additional surcharge based on carbon footprint	Economy-wide action	Proposed in various countries	Risk of evasion and capital flight; administrative complexity	High	Theoretical impact is based on progressive taxation literature; empirical evidence is limited (96).
Luxury consumption tax	Additional taxes on luxury goods and services to discourage excessive consumption	Luxury consumption	Not widely implemented	Reduced luxury market, potential for tax evasion	Medium	Limited evidence exists due to lack of implementation; similar policies (e.g., luxury car tax) show modest impact (162), modeling shows effectiveness, and there is a strong theoretical case.
Air travel levy	Extra charges on air travel to reflect environmental costs	Luxury consumption	United Kingdom (Air Passenger Duty)	Reduced travel demand impacting tourism industry	Medium	The United Kingdom's Air Passenger Duty has been shown to have a marginal effect on reducing travel demand and associated carbon emissions (97).

(*Continued*)

Table 1 (*Continued*)

Policy instrument	Description	Category	Example of where implemented	Potential adverse side effects and strategies to reduce these	Potential impact (high/medium/low)	Evidence of emissions reductions
Flight bans	Ban on flights for a particular distance where rail is available	Luxury consumption	France	No major side effects, but emission reduction benefits would be much lower if the alternative was cars.	Low to medium	Initial data suggest minor reductions in CO_2 as only limited routes are covered.
Meat tax	Tax on animal-based foods	Luxury consumption	Proposed in various European countries	Regressive impacts affect farmers and low-income and older households. Revenue recycling and compensation could help.	Medium	Meat taxes have been proposed to reduce consumption by up to 15% (98).
Mandates for large corporations	Include ambitious targets, aligned with global mitigation goals and time-bound plans. Windfall tax for large corporations	Individual action	A small number of corporations have voluntary targets	Emission accounting gaming by corporations, e.g., when choosing methods for estimating scope 3 emissions; no major side effects	Medium	Corporate emissions disclosures show significant reductions when binding targets are set (99).
Public awareness campaigns	Programs to educate the public about including the impacts of their consumption on climate and the impacts of high emissions	Individual action	Various countries	Limited direct impact on behavior, requires sustained effort	Low	Studies suggest public awareness leads to behavior change as part of several complementary policies (100).
Ethical marketplaces	Considering consumer ethics alongside business ethics when developing an ethical marketplace	Individual action	United States	Difficult to regulate moral behavior through legislation	Medium	Consumer demand for ethical products is rising but requires stronger policy support (101).
Ban on fossil fuel advertising	Prohibit advertising for fossil fuel products	Societal well-being	France, Amsterdam	Resistance from industry, legal challenges	Low	Restrictions on fossil fuel advertising are being implemented in various jurisdictions, aiming to reduce consumption and align with climate goals (79).

resources toward more productive uses, fostering both economic efficiency and environmental sustainability.

Some policies targeting home energy use or transport may impose unfair burdens on low-income households, including those with older people, children, single people, and the unemployed, and female-headed households. It is essential to understand the implications not just by income but by other confounding factors (61). There has been some opposition to uniform carbon taxes on the grounds of equity and distributional impacts (76). For example, a uniform carbon tax can make basic consumption expensive for some income groups. However, evidence shows that it can benefit low-income households and reduce poverty if revenue is redistributed appropriately (77, 78).

Specifically, empirical evidence from global carbon pricing initiatives demonstrates that revenue redistribution works and significantly influences public acceptance and policy durability (79). British Columbia's carbon tax, introduced in 2008, returns all revenues to households and firms, fostering widespread support and economic neutrality, with emissions reductions achieved alongside economic growth (80). Switzerland's carbon levy similarly directs two-thirds of its revenue as lump-sum payments to households and businesses, enhancing salience and public trust (81). In Norway, a portion of carbon revenues is reinvested into green technologies, maintaining industry competitiveness while supporting decarbonization efforts (82). Conversely, Australia's carbon tax (2012–2014) faced repeal due to weak political support, despite a design that returned substantial revenues to households and industry (83). These cases highlight that revenue transparency, targeted compensation for affected groups, and public trust in government institutions are crucial for ensuring the political viability and effectiveness of carbon pricing.

Importantly, without revenue redistribution, regulatory instruments can be more equitable and fair than carbon pricing (84). It is important to ensure that distributional concerns are understood and addressed. For example, after the Yellow Vests movement, which took root as a bottom-up movement with concerns about social justice, French people largely rejected a tax and dividend policy (85). The protesting group viewed the tax as unfair, and it felt the government should find ways to make the larger companies pay and should include people's opinions through democratic approaches (86).

Taxes imposed by governments can also have an additional advantage. Licari & Meier (87) show that the impact of a government-imposed tax on certain types of consumption can, in addition to the direct impact, also offer a signaling effect, which could further support achieving the intended objective. Acceptability of environmental taxes depends on various factors, including the level of education, political orientation, and trust in government. For instance, higher trust in government results in better acceptance of environmental taxes (88, 89).

Corvino (90) proposes imposing a limitarian carbon tax, which restricts the capabilities of the rich to undertake wasteful emission-generating activities. Both taxing positional goods and designing nudges can reduce status consumption of luxury goods (91). Taxing the income of the top 1% at 60% could decrease global emissions by 700 million tons, exceeding the total emissions of the United Kingdom, while also generating significant revenue that could be channeled toward low-income households via income tax reductions and direct transfers, or funding carbon-reducing investments. Redirecting wealth from the high-polluting investments of the super-rich to greener alternatives could significantly impact emission reduction efforts (92).

The dual effect of reducing wasteful consumption and enhancing public welfare creates a more balanced and sustainable economic model. By implementing such tax policies, governments can effectively reduce the environmental footprint of high-SES consumption and promote a more equitable distribution of wealth. A successful example is the tax reform in Uganda, where the national government decided to identify and improve the tax compliance of high-net-worth

individuals. Over time, 78% of the high-net-worth individuals filed income tax, compared with 13% before implementation. This resulted in additional revenue that the government could channel into social spending (93).

A progressive wealth tax can address economic inequality by targeting the wealthiest individuals (such as the people with wealth from $1 million to more than $100 billion), who collectively generate 1.6% of global income (2). This revenue can then fund social programs and infrastructure, promoting economic equity and growth. As wealth can be very difficult to account for (consider art investments or real estate), inheritance taxes that target very high-income individuals can be operationally preferable (94). All of these taxes may be compromised by tax oasis countries and race-to-the-bottom effects in the tax competition between countries. Hence, international global cooperation will help to strengthen the case for wealth or inheritance taxation.

Since a large proportion of emissions of very wealthy households comes from their investments, policies need to target both wealth and investment. Several studies have advocated an additional tax based on investments rather than the traditional consumer-facing options, as the former puts more onus on company executives and large shareholders who wield more power (38).

8. TARGETING SPECIFIC CONSUMPTION

Studies have shown the success of policies targeting specific consumption. These could include, for example, measures targeted to restricting air travel or reducing meat consumption.

For example, several studies show that meat is underpriced and does not account for the large externalities it imposes on land, water, ecosystems, and human health. In the absence of perfect economic solutions, a meat tax in high-income countries can be considered a second-best option that can encourage a shift to plant-based diets, reduce environmental impacts, improve public health, and support further innovation in meat analogues (102–104). A study of 149 global regions showed a meat tax (increasing the price of meat between 1% in low-income countries and nearly 100% in high-income countries) could reduce deaths and health expenses related to meat consumption, with the greatest reductions achievable in high- and middle-income countries (98).

Meat taxes can be regressive, but revenue recycling mechanisms toward reducing taxes for fruits and vegetables can partly offset this effect (105, 106). However, policymakers are often wary, fearing public disapproval. Fesenfeld (107) stresses the importance of careful policy packaging and design by strategically combining instruments that show benefits for citizens alongside those that appear to increase costs for consumers. Some of these concerns, e.g., rejection or disapproval by the general public, could be alleviated through better communication, including providing justification and explanation of potential impacts on prices, household incomes, the economy, expected dividends, and any local cobenefits (108). Perino & Schwickert (109) found that there was higher support for animal welfare considerations compared with emission reduction objectives. A Spanish study on the impacts of taxes on meat products concluded that combination of taxes across different products could often be a more viable strategy instead of high taxes on the most polluting category (110). Other options may include regulations on public cafeterias, information campaigns such as warning labels on red meat products, discounts on vegetarian food, and reduction of subsidies for fish and meat producers (107, 111). Strategies that shape consumer choices include eco-labels, nudges, and making no purchase a default option, although the latter may be relatively challenging to implement (112). Information campaigns could deliver emissions reductions but could take time given that meat consumption is ingrained in many diets (110). A recent study in Denmark found a complete phase-out of meat was not popular and recommended a staged approach, focusing on persuading consumers to reduce consumption through awareness campaigns; modifying dietary guidelines; providing incentives, including

discounts for sustainable behavior; nudging, such as making the vegetarian option the default option; and increasing availability of meat-free options (113, 114).

Three key unsustainable trends have been identified in the transport sector that can have huge emissions implications and exacerbate existing inequality by benefitting a very few individuals while contributing to large global negative externalities: personal travel, SUVs, and yachts. Gössling (115) studied consumption patterns in a small sample of billionaires and found they undertook between 14 and 77 flights per year, contributing between 18 and 1,200 tons CO_2/year. A recent addition to the list is space tourism, which involves sending citizens to space for recreational purposes. A single rocket emits three times as much CO_2 as a transatlantic flight, which can carry, on average, 50–100 times more passengers. Space tourism, by nature, caters to very rich individuals and is still in the early stages relative to other more widespread forms of luxury consumption. Markard et al. (9) argue that these unsustainable innovations may exacerbate existing inequalities and must be discouraged.

Carbon tax on transport fuels and differentiated vehicle tax have been effective (116). A carbon tax and a value-added tax on transport fuel in Sweden resulted in a decrease in transport CO_2 emissions by nearly 11% between 1990 and 2005 (95). A study across Nordic countries showed that choosing not to fly decreased carbon emissions across the upper-income individuals in all studied countries, while the emission reduction impacts of other low-carbon choices such as electric vehicles, a vegetarian diet, and renewable energy adoption varied across countries and income groups (25). This variation could be explained by several factors, such as differences in carbon intensity of electricity (i.e., high renewables in Iceland and Norway compared with Denmark and Finland), low-carbon heating (Norway), the presence of public transport (Sweden, Norway, Denmark, Finland), or reliance on imported goods (Iceland).

There are very few examples of transformative actions taken by the aviation industry to limit emissions. For example, there are recent discussions on a proposed ban on private jets at airports in Europe. Several countries, mainly in Europe have begun experimenting with a range of strategies to limit short-haul flights. These include supporting new rail routes improving the competitiveness of rail by reducing subsidies, or imposing additional taxes on flights. Studies analyzing a ban on short-haul flights in Europe show mixed results depending on whether the substitute is rail or car travel; and the bans may lead to increases in rail prices or increased car traffic (117). Investments in rail infrastructure and initiatives to improve the feasibility and affordability of high-speed rail have been proposed (118). In order to make a substantial reduction in aviation emissions, future initiatives for long-distance flights may be necessary (119). Similar to what has occurred with excess vehicle emissions, building codes could make efficiency improvements mandatory and impose fees on households failing to meet minimum benchmarks (50). Downsizing (shifting to a smaller dwelling) can be an efficient strategy to reduce energy demands and emissions associated with construction, heating, and cooling and deliver a host of other environmental and social benefits. However, social and environmental challenges and a lack of alternatives can be barriers to implementing policies that promote downsizing (120). A study on housing policies in the United Kingdom showed a high focus on efficiency and construction, but these did not focus on equitable use of floor space (121).

9. INDIVIDUALS AS CHANGE AGENTS

Several studies highlight the moral imperative—that climate change implies the wealthy have greater responsibility compared with the less-wealthy, making it necessary to find ways of shaping societal norms about behavior and consumption (69). Individuals with high SES can act as change agents through their choices and investments (5).

For example, in their capacity as shareholders, wealthy individuals can exert influence on companies and by selecting responsible asset management firms (122). These investors belong to the top 10% of SES and have the choice and power to influence where money is invested, and they can therefore influence wider society. In this way, investors can take on exemplary commitments to bring their portfolios in line with the most ambitious climate commitments (92).

Sufficiency: a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human well-being for all within planetary boundaries

Otto et al. (123) call for efforts to raise awareness among the rich regarding the implications of their choices. A survey of more than 4,000 participants across four countries (the United States, Denmark, India, and Nigeria) showed a widespread underestimation of carbon footprint inequality, particularly in the United States and Denmark. The study underscores the need for raising awareness regarding this inequality through public debates and highlighting social justice dimensions in order to obtaining higher support for climate policy (124). Similarly, Maczionsek et al. (125) studied 8,000 residents from Nordic countries and showed that the Nordic consumption-based carbon footprints were far above the global average. Self-perceived climate sustainability did not necessarily align with lower carbon footprints, directly confronting the perception of Nordics as climate leaders. The study recommends aligning public perception with sustainability measures and implementing demand-side actions.

Finding ways to frame sustainable behavior choices as high status can be effective in reducing emissions (21). Individual behavior change would require systemic change, for example, in access to and availability of alternate technologies and infrastructures (69, 126). The habit theory postulates that behavior is a function of an automatic process, and this can be a barrier to proenvironmental behavior despite awareness and good intentions. The role of habits in influencing behavior remains an unexplored research area in sustainability science (127).

The role of advertising in influencing choices has been explored in several studies. Advertising is designed to target the lifestyle and preferences of affluent consumers, which ultimately trickles down to other groups aspiring to enhance their socioeconomic profile, resulting in a culture of overconsumption (128, 129). Studies highlight that, akin to tobacco consumption, fossil fuel–related advertising should be banned, as this undermines climate action. Recently, the city of the Hague implemented legislation to ban fossil fuel advertising (130). While these strategies may take time to change social norms or deliver emissions reductions, they are important as they discourage companies from increasing aspirations in society (130). Increasingly, luxury brands are striving to incorporate sustainability into their own processes and encouraging sustainable consumption by leveraging attributes such as moral satisfaction and nature experiences and promoting cultural climate compatible narratives (131). Social media can help promote sufficiency-oriented consumption in the short run (132); however, more research is needed to see how such interventions can bring about wider awareness and sustained behavior change.

10. SUSTAINABLE CONSUMPTION THAT PROMOTES WELL-BEING FOR ALL

Unequal distribution of income impacts environmental quality, and this impact is particularly noticeable in developed countries. Attempts at equalizing this can include measures such as expanding the coverage of social security to vulnerable populations, optimizing the tax structure based on income levels, and developing suitable regulations to strengthen social assistance (133).

Several studies have highlighted the need for broader structural change, including reducing inequality in income distribution (e.g., increasing the incomes of low-income households) and the need to move away from capitalist societies in order to build a truly egalitarian society (63, 134–137). In addition, an increased focus on technology- or efficiency-based policies tends to dominate over the more unpopular options, such as redistributing carbon emission shares from the global

rich to the global poor (138). Policies that enhance social equity by, e.g., redistribution addressing income concentrations at the top of the distribution, such as a higher marginal tax rate at the upper end and taxes on wealth, may help in reducing carbon emissions (139). However, balancing economic growth, efficiency, and social justice is not an easy task for policymakers (140).

Research suggests that virtuous traits, such as self-confidence, courage, self-control, openness, and conscientiousness, can lead to socially responsible consumption behavior (141). Currently, policymakers have been more focused on ethical behavior of companies. However, for developing an ethical marketplace, consumers also need to be considered. Though it may be challenging to legislate moral behavior through regulation, a gradual approach can be adopted, such as introducing a consumer code of ethics with guidelines on ethical consumer behavior (142), which can bring a change in people's minds and impact individuals' beliefs. For example, the Better Business Bureau has implemented a consumer code of ethics for northern Indiana. Overall, the challenge lies in making the people think collectively rather than individually (143), and this can be achieved by leveraging the social ties with the community through civil society and other local participatory programs.

Emerging literature highlights that reliance on technology and efficiency alone cannot deliver deep cuts; further sufficiency measures are required (144). Such measures involve promoting less materially intensive consumption patterns that focus on well-being rather than material wealth (145). Sandberg (146) discusses four categories of actions, which are absolute reductions; mode shifts; product longevity; and sharing practices for sectors including housing, nutrition mobility, and other miscellaneous categories. These could include, for example, actions such as reducing the size of homes; avoiding air travel; reducing food waste; shifting from meat-based diets to plant-based diets; repairing and using products longer; and reducing miscellaneous consumption such as clothing, electronics, and leisure activities. Recommendations of citizen assemblies in 10 European countries showed that nearly 40% of the 860 mitigation policies were sufficiency oriented (147). The study concluded that poor adoption of sufficiency was not about legitimacy but related to other barriers, i.e., reluctance to implement sufficiency policies, the nature of the policymaking process, and competing interests (147).

Several of these demand-side sectoral actions can enhance well-being, e.g., dietary change, provision of high-quality, affordable public housing, etc. They can steer behavior, technology adoption, and individual lifestyles to reduce energy demand while providing the same level of service and, in many cases, improving well-being (148). For example, there is a growing body of evidence showing how dietary shifts and sustainable urban planning that enables active transport can deliver multiple benefits, including improving individual health and well-being (149, 150). Emerging discussions around degrowth converge around the idea that wealthy countries can prosper with reduced material and energy needs if the objective is a focus on well-being instead of high GDP growth (151, 152). This would include a focus on alternate strategies to meet human needs and enhance development, including guaranteeing green jobs, exploring reduced working hours, focusing on skill development, reducing production in environmentally harmful sectors, and ensuring provision of low-carbon and resilient infrastructure and services. Emerging evidence from some countries shows the positive impact of pilot initiatives such as reduced work hours and other changes in lifestyle that enhance health and well-being at lower emissions levels (153, 154). However, how these impacts may differ with levels of inequality and other confounding factors need to be better understood (155). More studies are needed to ensure if and how these initiatives can be scaled up. Reducing floor space through smaller homes can be achieved through public policies that support downsizing through regulations and incentives and support from the real estate sector, companies, and media to shape positive public perceptions about smaller homes (156).

These interventions may include caps on the number of homes or limiting floor space, discouraging harmful leisure activities such as yacht ownership and use, space tourism, etc. Also, other actors in the market, such as companies and the media, can be influential in shaping public perceptions of small-sized dwellings as environmentally sustainable housing, so they need to become aware of the environmental impact of downsizing.

It is, however, challenging to implement such policies, since it is the high-income group that wields more power in society and therefore will most resist a change in status quo. The pros and cons of calling out high-emitting individuals and organizations, or climate shaming, have been under discussion recently. Aaltola (157) discusses climate shame as an effective method that enables reflecting on environmentally damaging practices and allows for developing positive ways of coexistence with nature. While nongovernmental organizations have relied on naming and shaming governments and private organizations to call out climate inaction (158), in recent years, overconsumption and luxury consumption have received increasing coverage in social media, the press, and mainstream conversations. While the impact of flight shaming on reducing air traffic is not clear, this phenomenon has influenced some European governments and the airline industry to consider their impact seriously and take action (159). A recent study showed a feeling of shame and other negative emotions triggered by meat-shaming messages that also resulted in reduced purchase intentions (160). Climate shaming can be an effective psychological method, allowing for a critical reflection of environmentally damaging behavior and guiding toward a positive coexistence with the natural world (157). A counterview is that shaming should not be considered on moral grounds and can have unintended side effects, such as alienation or disconnect from others. An approach focused on education or empathy should be considered as a potential solution instead (161).

11. CONCLUSION

That wealthy households and individuals consume and emit far in excess of global averages is now an indisputable fact. There are common patterns of consumption among wealthy households and individuals globally, including large homes, multiple homes, a sizable transport footprint including more frequent travel by private planes, the usage of yachts, and other forms of luxury consumption. Such consumption is incompatible with the urgency for climate action and contrasts with the growing awareness around reducing and shifting to sustainable consumption and low-emission lifestyles.

Earlier studies show that until recently, climate policy instruments have had limited success (but also limited ambition) in reducing emissions-intensive consumption or investments (2). Nonetheless, a growing number of countries are beginning to implement policies and instruments to address luxury consumption, such as meat taxes or bans on short-haul flights. Since much of this consumption is embedded within social norms and beliefs, there is a need to bring in greater awareness and change. Those with high SES wield power over policies and consequently the society at large and can resist policies that change the status quo. There is a need to address political economy and structural barriers to accelerate such a shift. Raising awareness about harmful impacts of luxury consumption among wealthy groups is needed. On the positive side, celebrities and other influencers have a large impact on certain sections of the public and can make a sizable difference by acting as role models promoting sustainable lifestyles, while organizations must take greater responsibility in curbing unsustainable consumption aspirations.

Any serious intent to address rising emissions globally and nationally requires governments and organizations to address the issue of curbing luxury emissions with urgency and high ambition.

A large part of the world lacks adequate shelter, mobility, nutrition, and healthcare. Meeting basic needs and reducing income inequality are basic tenets of sustainable development and must be given equal or higher priority than economic efficiency. Curtailing luxury consumption does not conflict with any of these goals and can enable better and more equitable use of resources.

SUMMARY POINTS

1. There is limited adoption of targeted policies, whether taxation or bans, or individual behavior change on addressing luxury consumption so far.
2. Limited scope and ambition result in limited emission reductions.
3. The growing number of initiatives by countries, cities, organizations and individuals signals increasing intent to address luxury consumption.
4. New social norms favoring decent living are necessary to put the brakes on the carbon-intensive status race.
5. Influencers, including high-status individuals and celebrities, structurally maintain a vested interest in maintaining the aspirational imagery of high consumption lifestyles but would be key change agents in advancing low-carbon lifestyles.
6. Carbon taxes and similar instruments have a relevant impact on emission reductions and can support lower income households if associated with revenue redistribution.
7. Differentiating taxes between luxury and essential goods can substantially reduce GHG emissions, while making climate policies more acceptable among low- and middle-income households.
8. Ambitious actions require higher political will and overcoming political economy and structural barriers.

FUTURE ISSUES

1. Reducing luxury consumption can be an important strategy for emission reductions. There is an urgent need for specific studies that demonstrate the impact of specific policies and actions addressing this.
2. Future studies focusing on how strategies addressing consumption can also address personal well-being, reduce inequality, and deliver environmental benefits can make a stronger case for ambitious climate action.
3. Specific investigations into the role of different actors such as investors, consumers, and firms are needed.
4. There is a need to bring in greater awareness and change, and address political economy and structural barriers, all of which can help accelerate a shift toward sustainable consumption.

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The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

AUTHOR CONTRIBUTIONS

Minal Pathak was responsible for the conceptualization, writing, review, editing, and visualization of the article. Felix Creutzig was responsible for writing, review, editing, and support for graphics and tables of the article. Dipti Gupta was responsible for the writing, review, and editing of the article.

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