Abstract
Access to energy is a precondition for a decent standard of living. Some household decisions on energy consumption are however motivated to maintain or improve status, resulting in social zero-sum games, with environmentally harmful outcomes. Here, we review evidence relating status to energy consumption, elucidating consequential opportunities for climate change mitigation. To achieve this, we comprehensively collate and analyse existing published work that links status to household consumption decisions and behaviour across all end-use sectors, screening 2662 papers found with systematic search queries, identifying and fully reviewing 53 papers that comply with our criteria. We develop a systematic map of the literature and review quantitative and qualitative analysis relating energy end-use to status consumption. We identify 23 distinct (albeit some of them closely related) theories, with the literature most frequently referring to Veblen’s theory of conspicuous consumption. We also detail estimations of status-related energy consumption and identify ten studies that quantitatively relate status to energy saving behaviour or decisions, and four studies that relate status to increased emissions. Status can explain up to 20% change in consumption levels or the willingness-to-pay for carbon reducing consumption. Surprisingly, we find that major status-related consumption decisions, such as for housing and big cars, are hardly captured by the literature that relates status consumption to energy use and greenhouse gas emissions. This is a considerable gap in the literature, omitting major sources of status related decisions with high carbon footprint. We conclude that framing energy saving behaviour as high status is a promising strategy for emission reduction. Progressive taxation of status items, such as floor space and vehicle size, can effectively internalize the positional externalities and signal social undesirability, but also reduce emissions.

1. Introduction
Making a dent in the climate targets will require a large and sustained action from societies from across the globe. This will warrant social sciences to function alongside natural sciences to offer comprehensive solutions to climate change problems (O’Toole 2017). Social sciences brings in the consumer perspective of energy use that is currently underrepresented in the climate and energy models. Collectively coined as demand-side solutions (Creutzig et al 2016, 2018), mitigation options—most relevant for long term climate strategies—emerging from interdisciplinary social sciences are increasingly gaining coverage in scientific and policy research. Recommendations for the inclusion of social sciences range from replacing stylized assumptions of human behaviour with data-driven theories (Stern et al 2016), using agent-based modelling and socio-technical analysis to address behavioural inadequacies in existing energy models (Geels et al 2016, Rai and Henry 2016), and to reconceptualising consumers as active stakeholders in designing new social routines around energy use (Schot et al 2016).

Social solutions so far focused on behavioural change for inducing carbon footprint reduction and promoting low-carbon options that narrow the focus level to individuals, households and community decision making. Routine decisions around food, mobility and housing consumption activities serve as promising domains to explore behavioural interventions. Yet at the same time, it is also clear that energy is
essential to reaching wellbeing objectives, that would include meeting basic living standards for developing societies to adequate levels of wellbeing (Pachauri and Spreng 2011, Rao et al 2019). In culturally entrenched economies, low-income households often from rural areas and urban slums consume and purchase to conform to the socially acceptable norms to prevent being sidelined or excluded from community activities and interactions. Similarly, households from high income households consume goods to signal social distinction, awarding them uniqueness, status and appearance of nonconformity. When mimicked by aspiring middle income households, this status behaviour quickly transforms into a social norm. This trickling down of lifestyle standards, that often is not only expensive, but also energy intensive, may undo much of climate change mitigation measures in other domains. Consequences of such dynamics often result in higher levels of unwanted consumption that is unequal and contribute little to overall wellbeing.

The role of status related consumption for carbon footprints (amount of carbon dioxide (CO₂ emissions) produced by an individual, activity-good or service, or organisation) and climate change mitigations has so far only been partially explored. As one of the early works that looks at demand-side energy research, Lutzenheiser (1992, 2000) discussed the importance of culture, behaviour lifestyle, and social preferences in social stratification and status display. Laying the groundwork for future examinations, he poses questions of their implications on energy use and environment. In outlining the role of non-income factors, Stern et al (2016a) underline identity, status and social norms as key influencers on households’ energy choices. People view their consumption as a signal to others. The pattern of such consumer behaviour, often associated with the notion of ‘keeping up with the Joneses’, has been examined from multi-disciplinary perspectives. Eastman and Eastman (2011) studied status consumption with economic aspects of value, price and brands through consumer consciousness. Kim and Jang (2014) examined the drivers of status consumption using the mental accounting framework (Thaler 1985) and signalling theory (Griskevicius et al 2007) to reveal the difference in income sourced and gender based consumption patterns.

Status as a form of social value associated with energy behaviours and consumption patterns plays out differently across geographies, urban/rural settlements, goods and services and socio-economic backgrounds. To comprehensively assess the interrelationship between households’ energy choices and their status-seeking practices, it is useful to bring together existing research evidence on the status perceptions from across disciplines for a systematic analysis. Currently, there exists no comprehensive and systematic review work, formal or otherwise, that collates existing research on status to draw sectoral or theoretical insights on the energy consumption. This systematic review aims to fill that gap.

Specifically we ask: what does the evidence reveal about the role of status as a demand-side driver of household energy consumption choices?

Section 2 briefly explains the definition of status we adopt for the review. Section 3 outlines the review methodology and section 4 presents results of topic modelling and the literature heat map. Section 5 expands on the quantitative estimates and a synthesis of theoretical evidence on status and sector-wise consumption. Section 6 discusses the results with a focus on the evident research gap on positional goods such as housing and big cars when it comes to status. We conclude with recommendation for future research in Section 7.

2. Characterization of status

Status has been identified as one of the important non-financial factors motivating household energy choices (Steg et al 2015). The term status encompasses various definitions and forms, although to convey the same idea of the ‘position or rank that a person holds within a social structure (groups and society) or is awarded to an individual by others’. Often social status has been linked to the hierarchical social differences derived from income level, education and occupation types (Coleman 1983) that is achieved over-time. While these hierarchical social differences allow for determining the amount of social status or those with whom one makes social comparisons, a consumer may also desire for status through the purchase or consumption of goods and services that confer the status, irrespective of the consumer’s objective income or social class (Eastman et al 1999). This refers to status consumption, the utility of which is measured by the social advantage offered by their purchase onto the consumer and perceived so by the relevant others. The paper aims to review available literature focused status that emerges from the consumption of end-use energy (goods and services).

3. Methodology

After defining the research question, the review process commenced with search for relevant studies on 2 March 2019. We used the Web of Science (WoS) database to implement the search query that aims at capturing documents that refer to: (a) status (or other expressions of social identity), (b) an energy consuming sector or activity, and (c) the final consumer (non-commercial in nature). A compilation of ‘Status’ in its various terminologies was done from previous studies on social drivers of household consumption.

The Boolean search string used in the WoS database was: (‘status’ OR ‘social standing’ OR ‘positional goods’ OR ‘relative standing’ OR ‘social norm’
Mercator Research Institute on Global Commons and Climate details the step-wise flow of the systematic independent search results in 11 additional papers. The WoS database yielded 2662 papers reference to goods consumption or activities by end consumers. The search query was restricted to the English language but included all kinds of documents spanning the time period from 1945 to 2019. In addition to searches through the WoS database, studies were individually identified through Google scholar that matched the review criteria of studying social status in reference to goods consumption or activities by end consumers. The WoS database yielded 2662 papers after two iterations of the search query, while the independent search results in 11 additional papers. Figure 1 details the step-wise flow of the systematic review process including the inclusion and exclusion criteria.

The first step of scoping review involved screening the titles and abstract to exclude articles that were irrelevant to the theme of the review. Exclusion was based on no mention or preliminary examination of status (social or otherwise), and neither household consumption (behaviour). The first level of screening reduced the article count to 200. In the second step, we extracted full texts of the 200 articles. In cases where the articles were not accessible through online subscriptions, the authors were contacted for copies of the same. All except one were retrieved. The full texts were focused on including articles that examined consumption of goods or activities by consumers (individuals or households). The search string was developed to include all forms of consumption undertaken by a household. This consumption was sought for the energy using sectors, such as transport, buildings, food, clothing, electricity and recycling, as well as consumer behaviour (such as environmental conservation, green practices), luxury goods and conspicuous expenditure. Upon examination of the corpus of literature, activities and domains that were not directly associated to household consumption such as visual media, hospitality industry, were excluded. We did not exclude any article based on a country.

The second step of screening lowered the article count to 69.

The final screening step, and in some cases a parallel process to step 2, we screened for more precise reference to status being measured or theoretically examined. This was a key concern of the authors with respect to the definition of status to be considered for the review. A paper was included if there was a direct discussion in terms of status symbol, status signalling, social standing/class, prestige, reputation, status seeking, status-based consumption, social stratification. The paper was excluded if it referred to status as socio-economic status or alternatively mentioned educational attainment, occupational class, or household income as status indicators. With an initial literature set capturing all ways in which status was captured, it was realized that status from a social position, that is closely related to the image signalled via consumption needed to be separated from other definitions of status. Status that was defined as representative of profession/occupation types, income levels, education levels, marital/family status and other categories that were more indicative of the economic or demographic position of the household, were removed from the literature for review. Out of 69 papers that were selected for full text reads in step 3, 16 paper were removed as they considered status as socio-economic and demographic indicators as defined above. Most importantly, it was essential to the review that status was amongst the key components of analysis in the papers. And so, studies that mentioned status, even explicitly, but as background information or in brief or extended linkages were excluded. Lastly, studies that involved systematic reviewing, evidence synthesis or review of reviews but did not explicitly discuss status (as defined by us) or clear consumption sectors/behaviours were excluded from this review. The final number of articles selected for the review was 53.

As a first step in analysing the body of literature on status and household energy use, we use topic modelling that allows for an exploratory review of literature to identify concepts and subjects and the underlying thematic structure out of the corpus (collection of research papers). More formally, topic modelling an unsupervised machine-learning technique, where patterns of word co-occurrences are used to learn a set of topics (or group of words) that describe the corpus (Callaghan et al 2020). By providing a rough panorama of the research at hand, this statistical approach will facilitate organisation, understanding and summarisation of the large amount of textual information provided in the 53 papers into key words in order of association with underlying topics. For us, the results are useful in mapping out the research topics examined in relation to status in energy consumption.

The search results were screened and managed using the software for evidence synthesis—‘Scoping Review Helper’ (developed by MCC3). The software was used for eliminating duplicates, extracting data and conducting synthesis including Topic Modelling.

Additionally, we also created heat maps to visualize the literature that intersects across all consumption ‘sectors’ and the ‘methods’ used in studies to analyse status.

3 Mercator Research Institute on Global Commons and Climate Change.
4. Results from topic modelling and heat map

Using abstracts from the collected articles as the primary data, topics are machine learned using the non-negative matrix factorization (NMF) method (Lee and Seung 1999) for a comprehensive content analysis in the text corpus. A crucial consideration when applying topic modelling is the selection of an appropriate number of topics—*k*, for the corpus at hand. Choosing a value *k* too less would generate topics that are very broad, while choosing a value too high could result in ‘over-clustering’ of the data (Greene et al 2014). To tackle this challenge, we carry out various topic models for a *k* value ranging from five to ten topics. For each model iteration, the topics are hand-labelled and compared across the models (topics generated when *k* = 5 is compared with topics generated when *k* = 6, and 7, and so on), to ensure robustness in the topics that are finalized by us for the review. Furthermore, all topics derived from NMF method are also compared to the topics derived using latent Dirichlet allocation (LDA) method (Blei et al 2003). Under the LDA method, the clusters produced were too similar to label with adequate distinction, less coherent as the number of topics modelled increased, and often had multiple topics with similar themes. For this reason, NMF was chosen over LDA method.

As the resolution of the topic models increased from five to ten, the topics seemed to become over defined for topics over seven, such that multiple topics consisted of similar terms thus reducing the meaningfulness of the model results. The topics and highly-associated words from the seven-topic model extracted from the topic model NMF appeared to have the optimal coverage of topics and is presented in table 1 (the order of the topics in the table is not meaningful). Based on the top ten associated words describing the topic, the labelling was done to be semantically meaningful. These included ‘Ethical Consumption’, ‘Conspicuous Consumption’, ‘Household Energy’, ‘Green Signaling’, ‘Transport (behaviour)’, ‘Organic Food’, and ‘Urban housing’. Text mining done through topic modelling uncovered latent themes in textual data that provided details on the various domains of literature on energy and status. The topic names in table 1 represent the ten highly-associated and representative terms, that have occurred the most when examining status and consumption.
The topics and words highly associates with it for five- and six-topic models as well as the proportion of the topics over the year of publication is provided in the appendix. The proportion of topics over the publication years present the changing literature landscape for research on status (social or otherwise) highlighting topics that have gained or lost references over time. Analysing the topic proportions in the seven-topic model, the past 10 years (2010–2019) saw a gradual increase in the proportion of papers on the topic of ‘Conspicuous Consumption’, while papers covering topics of ‘Green Signaling’, have severely fallen in share. Article on topics of ‘Transport’ and ‘Ethical Consumption’ have been relevant in proportion over the assessment period, though the proportion of the topic ‘Ethical Consumption’ reduced with topics of ‘Organic Food’ and ‘Urban Housing’ gaining proportion in the recent years. Over the past decade, papers including topic of ‘Rural Energy’ have constituted atleast 10% of the corpus.

The seven-topic model highlights evidence on transport, housing and food as sectors most prominent in literature surrounding status and energy demand. Along with the growing number of studies in recent literature, the model findings are consistent with our assumption that exploring status-based energy consumption is gaining high relevance. A deeper review of existing evidence of housing and transport from the lens of positionality (‘Positional Goods’, Hirsch 1976) is carried out in section 5.

The heatmap (figure 2) reiterates the findings of the topic modelling, such that the studies under

Table 1. Seven-topic model—topics and top ten words.

| High-ass. | Topic #1 | Topic #2 | Topic #3 | Topic #4 | Topic #5 | Topic #6 | Topic #7 |
|-----------|----------|----------|----------|----------|----------|----------|----------|
| words     | ethical  | transport| green    | conspicuous| household| organic  | housing  |
| 1         | Social   | Car      | Status   | Ethic    | Growth   | Meat     | Incom    |
| 2         | Consumpt | Policie  | Product  | Behaviour | Environment| Altern   | Automobil|
| 3         | Status   | Signal   | Status   | Behaviour | Because  | Cost     | Mobil    |
| 4         | Ethic    | Behaviour| Status   | Consumer  | Becausc  | Consum   | Environment|
| 5         | Environment | Conspicuous| Culture   | Signalling| Consumpt | One     | Style    |
| 6         | Growth   | Prefer   | Behaviour| Consumer  | Service  | One     | Style    |
| 7         | Meas     | Alter    | Cost     | One      | Service  | One     | Style    |
| 8         | Prospect | Use      | Consum   | Class    | Display  | Load    | Style    |
| 9         | Incom    | Automobil| Environment| Style   | Display  | Load    | Style    |
| 10        | Inequity | Relat    | Think    | Load     | Display  | Load    | Think    |

Note: Stemming (shortening) of key words is carried out before Topic Modelling using snowball stemmer. Further details are provided in the appendix (available online at stacks.iop.org/ERL/16/053010/mmedia).
review are concentrated in residential energy (housing, cooking, lighting etc.), transport, food and consumer goods sectors. The studies for most part use similar analytical methods and incorporate status either as proxies though symbols or signals of status. Qualitative and Statistical methods are the most frequent applications across sectors. Statistical analysis methods include ANOVA, factor analysis and regression, while qualitative methods include narrative (also interview-based) analysis, phenomenological techniques, literature review, and theoretical analysis. Other methods, while adopted in few studies include material flow analysis and diffusion models.

5. Synthesizing evidence from quantitative estimates and theoretical underpinning

5.1. Quantitative estimates of the effect of status on consumption

Nearly 30% of the studies provide some form of quantification for the effect of status on the consumption of good or service. Table 2(a, b, c) summarizes the effect of status (seeking or signalling) on various consumption options in the domains of transport, residential energy, food, consumer goods, clothing and buildings. The effect of status is seen to have favourable as well as unfavourable benefits/impacts on the environment. Accordingly, table 2(a) summarizes the status effects that are beneficial to the environment (promote green goods, reduced energy consumption etc.), table 2(b) summarizes effects that are environmentally harmful (higher (carbon) consumption), and table 2(c) summarizes effects that are not specifically significant (does not increase or decrease consumption levels).

Quantitative findings were extracted out of 16 studies that varied in dimensions and measurements. The lack of standard results permitted low comparability across studies. Yet, classification based on direction and magnitude of status effect and the nature of intended consumption was possible. The studies can be classified to address status effects with regard to conspicuous or low-carbon consumption (with mitigation potential).

Most studies that quantified the status effect was in the domain of transport, a sector well associated with status-based consumption. The value of prestige conferred on vehicle ownership, specifically car, can shift people from multi-modal lifestyles to automobile dependency. Litman (2011) estimated the positional concern to potentially increase the vehicle ownership by 5%–15% in the short term, while accounting for the functional value of ownership. This ownership potential can increase by 10%–20% in the long run, as a result of alternate modes such as walking, public transit and cycling being simultaneously stigmatized. For example, car reduction policies in Lahore, Pakistan were found to be less preferred as the social status consciousness (measured on a six-point Likert scale) increased among consumers (Javid 2017). Furthermore, associating a status indicator (positive or negative) with carsharing revealed no significant influence in uptake in Beijing, China (Yoon et al 2017).

Status has also been examined through conspicuousness but in the low-carbon context. In assessing the value of car ownership as a conspicuous good, Sexton and Sexton (2014) and Delgado et al (2015) found car segments carried a value share for status that was conveyed through increased environmental consciousness—for instance, the Toyota Prius. Testing and confirming the presence of conspicuous conservation effect, Sexton and Sexton (2014) estimated the willingness to pay for a green status signal as $430–4200. Alongside, Delgado et al (2015) estimated the value of environmental status signal between $587 and 1954 for hybrids over non-hybrids.

The effect of status on residential energy use was estimated for energy reduction (low-carbon) measures such as recycling, electricity consumption reduction and sustainable consumption behaviour as well as on ostentatious visible expenditures. Status displayed through reputation (for green consumption) that is signalled via public information was found to result in a 20% reduction in heating and cooling energy (Delmas and Lessem 2014). The link between status and environmentally conscious behaviour was also tested by Zabkar and Hosta (2013), who found individuals with perception of high prosocial status to be twice more likely willing to engage in environmentally conscious behaviour than those with low prosocial perceptions. In exploring how social status experiences can turn into ethicality nudges in North American universities, Puauchunder (2017) found that a loss in social status is met with increased consciousness on recycling behaviour and reduced energy light consumption. Status and conspicuous consumption in the residential energy context of rural India was examined by Rao (2001) arguing that publicly observable celebrations such as weddings and festivals serve as arenas for status-making competition, thus increasing conspicuous consumption. Rao finds an increase in expenditure on such events to raise the social status levels of the family.

Daily household consumables such as edible groceries, toiletries, batteries were found to positively determine the level of social status if the consumable held a ‘green’ profile, i.e. produced by eco-friendly companies (Kohlova and Urban 2018). A shopping basket comprising green products increased the odds of the consumers holding a higher social status by over 2 times, relative to consumers of conventional products. However, 'Fair Trade' coffee that symbolized ethical consumption, was found not to be affected by the pursuit of an image (status) in...
Table 2. Effect of status on consumption options.

| End-use sector | Nature of consumption | Detailed status effect | Quantitative effect of status on consumption | Reference Article |
|----------------|-----------------------|------------------------|---------------------------------------------|------------------|
| (a) Positive benefit to the environment | | | | |
| Transport | Conspicuous consumption | Estimate of the mean willingness to pay for the environmental status afforded by Prius ownership. | $430–4200 | Sexton and Sexton (2014) |
| | Conspicuous consumption | The Prius status signal of $587. Hybrids, in general, have a premium over non-hybrids of approximately $2000. The environmental status signal is approximately $650 to $700 across green and brown cities. | $587–2000 | Delgado et al (2015) |
| Residential Energy | Low-carbon consumption | Loss in social status is significant in driving recycling behaviour and sustainable energy light consumption. | ANOVA F-statistics | Puaschunder (2017) |
| | Low-carbon consumption | Results suggest that while private information alone was ineffective, public information combined with private information motivated a 20% reduction in electricity consumption achieved through lower use of heating and cooling for above median energy users. | | Delmas and Lessem (2014) |
| | Low-carbon consumption | The positive association between ‘willingness’ and ‘behaviour’ increased as ‘prosocial status’ perceptions increased—from 0.49–0.81. | Low-status perception—0.49 high-status perception—0.81 | Zabkar and Hosta (2013) |
| Consumer Goods* | Low-carbon consumption | Odds of consumer purchasing green (profiled) products signalled elevated social status 2.05/2.54 times higher than consumer purchasing conventional products, independent of the explicit costs associated with such consumption. | Odds Ratio = 2.05, 2.54 | Kohlová and Urban (2018) |
| Food | Low-carbon consumption | The majority of participants agreed that organic food consumption is a type of social prestige and a change in lifestyle that can motivate people to buy organic foods (percentage of people agreeing to this view is given). | Stated preference—63% agree that buying organic suggests a type of social prestige | Al-Taie et al (2015) |
| | Low-carbon consumption | Whereas 50% of the chosen products were organic in the control condition, the corresponding share was 70% in the status condition (where high status motives were elicited to the participants during the study). | 70% of products chosen organic under status condition, relative to 50% in control | Puska et al (2018) |
| Clothing | Low-carbon consumption | A unit increase in measure of Status enhancement (measured on a seven-point scale 1—strongly disagree to 7—strongly agree) significant increased the overall consumer attitude towards ERC by 0.34 unit. Regression Coefficient: 0.34. | $\beta = 0.34$ | Reimers et al (2017) |
| Buildings | Low-carbon consumption | Enhancement of status was found to be one of the benefits of sustainable affordable housing. | Status component explained 5.48% of the total variance; or 86% of the model | Olanrewaju et al (2018) |

(Continued.)
| End-use sector | Nature of consumption | Detailed status effect                                                                                                                                                                                                                                                                                                                                                      | Quantitative effect of status on consumption | Reference Article |
|----------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------|
| (b) Negative effect to the environment                                                                                                                                  |                      |                                                                                                                                                                                                                                                                                                                                                                                  | β = −0.14 to −0.25 | Javid (2017)     |
| Transport      | Low-carbon consumption| An increase in social status consciousness (measured on a six-point scale 1—strongly disagree to 6—strongly agree) negatively affects car reduction policies, i.e. a unit increase in social status consciousness results in a decrease in policy of reduced use of private vehicles by 0.23, decrease in use of public transport by 0.25, decrease in shift to car sharing by 0.14, and decrease in the shift to office or campus transport by 0.25 in Lahore city, Pakistan. | β = −0.14 to −0.25 | Javid (2017)     |
| Transport      | Conspicuous consumption| Motor vehicles do provide significant functional benefits, so prestige value alone only increases vehicle ownership only modestly, perhaps 5%–15% in the short-term. The total impact of stigmatization on travel behaviour is probably moderate to large, particularly in urban areas over the long run, increasing automobile travel 10%–20% more than would otherwise occur. | 5%–15% increase in vehicle ownership in short term, 10%–20% increase in automobile travel | Litman (2011)    |
| Residential    | Energy                | Expenditures on weddings and festivals as publicly observable celebrations have two functions: they provide a space for maintaining social reputations and webs of obligation, and they serve as arenas for status-enhancing competitions. Annual festival expenditures are independently associated with higher social status, and, once again, festival expenditures interacted with income to result in lower status. At the median income a 1000-rupee increase in festival expenditures raises the family’s status level by 0.39 standard deviations. | A 1000-rupee increase in festival expenditures raises the family’s status level by 0.39 standard deviations | Rao (2001)       |
| Consumer       | Goods                 | A unit increase in the social status demonstration (measured on a five-point scale 1—strongly disagree to 5—strongly agree) of people with strong face consciousness (i.e. view of their own public image) increases the Habitual HCCB by 0.231 unit. | β = 0.231 | Mi et al (2018) |
| (c) No significant effect to the environment                                                                                                                             |                      |                                                                                                                                                                                                                                                                                                                                                                                  | No significant influence | Yoon, Cherry and Jones (2017) |
| Transport      | Low-carbon consumption| Large decal (decorative sticker) advertising that you are using a carshare vehicle is any indicator of image or status (positive or negative), it has no influence on carsharing choice.                                                                                                                                                                                                                                              | No significant influence | Yoon, Cherry and Jones (2017) |
Table 2. (Continued.)

| End-use sector | Nature of consumption | Detailed status effect | Quantitative effect of status on consumption | Reference Article |
|----------------|-----------------------|------------------------|---------------------------------------------|-------------------|
| Consumer Goods<sup>b</sup> | Low-carbon consumption | People consume ethically (fair trade coffee in this case) primarily because they actually care about the people and the places that are impacted by the production of commodities they purchase, rather than because they are concerned about their image in the eyes of others. That is status does not have an effect of if people consume fair trade coffee in public or private. | No significant influence | Hudson et al. (2013) |

Note:
- a Green cities are those with relatively high share of democratic voter support for President Obama in the 2008 election, and brown cities are those with relatively low democratic voter support for President Obama.
- b Consumer goods include household consumables such as laundry detergent, shampoo, paper towels, groceries, bulbs etc.
- β refers to the regression coefficient estimating the effect of status on consumption levels.

HCCB: high carbon consumer behaviour
ERC: environmentally responsible clothing

an audience, but rather the pre-existing belief or concern around responsible consumption (Hudson et al. 2013). Confirming conventional linkages, conspicuous consumption motivations such as status, was found to significantly determine high carbon consumption behaviour (HCCB) amongst urban residents of China’s Jiangsu province. Mi et al. (2018) show the demonstration of social status (measured on a five-point Likert scale) as a driver of habitual HCCB specifically for affect people with strong face consciousness.

The review on the potential of status to influence food choices focused primarily on organic food options, characterizing low-carbon choices. As drivers of organic food consumption, over 60% of sample respondents from selected communities of the United Arab Emirates associated social prestige to organic food purchases (Al-Taie et al. 2015). The activation of status motives also resulted in significant prosocial organic food choices for student respondents of a Finnish city (Puska et al. 2018). Relative to a control condition with no status pretexts provided, 40% more respondents under treatment conditions with status motives activated chose organic food products. Further, the study found strong linkages between status, food choices and wellbeing, with prosocial status signalling of ‘going green to be seen’ manifesting itself at a level where the organic food choices indicated happiness and hopefulness.

Clothing has been closely seen to reflect individual status consciousness, through preference for brands and perception of brand’s status (O’Cass and Siahtiri 2014). How significant is status in consumer attitudes towards environmentally responsible clothing was examined by Reimers et al. (2017) to find that more the purchase behaviour tended to seeking reputation and recognition from others, higher was the attitude and intention towards purchasing environmentally responsible clothing. The enhancement of status was also significant in explaining the choice of sustainable affordable housing over conventional buildings (Olanrewaju et al. 2018). Status improvements though the increased image of housing and of occupants were seen benefits of sustainable housing.

5.2. Theoretical underpinnings for role of status in consumption

From our literature base, we identified theories that formed the underlying basis for the frameworks of analysis, explaining or hypothesizing how status relates to consumption choices or levels. Among the 53 articles under review, 32 articles explicitly cite theories. All together these papers cover 23 theories that address the relationship between status and consumption. A brief definition of these theories and the sectors that have applied them for analysis is presented in table 3.

Twenty-one studies did not explicitly specify a formal theoretical basis for their analysis. Yet, most of the 21 studies refer to theories and models that have been more explicit in other articles.

5.3. How theories explain status consciousness in energy consumption decisions?

Literature has argued for the existence of social status as a key element in consumption. Signaling through consumption can be traced back to Plato, who claimed happiness to be guided by the importance of appearance over truth (Heffetz 2011). More recently, the relationship is studied through ‘conspicuous consumption’ (Veblen 1899), ‘positional goods’ (Hirsch 1976), and ‘consumption behaviour’ in perpetuating ‘social class’ and maintaining ‘power structures in society’ (Bourdieu 1986). These seminal works in the literature on the social influences
Table 3. Key theories relevant to Status identified in the review.

| Theories | Brief theoretical explanation | Sectors | Reference Article |
|----------|--------------------------------|---------|-------------------|
| Behaviour Economics | Study of mechanisms analysing the economic consequences of behaviour, both in experiments and in reality—preferences, beliefs and decision-making. | Transport | Mattauch et al (2016) |
| Behaviour theory (conservation, environmental) | Theories that seek to systematically understand behaviours and decision-making that will provide motivation for conservation—cultivating a green reputation—and pro environmental-actions. | Residential energy, consumer behaviour | Delmas and Lessem (2014), Vugt et al (2014) |
| Conspicuous consumption (incl. Veblen’s theory of consumer behaviour) | In societies with fluid social mobility, inequalities encourage households to seek social certification and social status through (conspicuous) consumption. | Transport, food, residential energy, consumer goods, buildings | Wisman (2011), Sexton and Sexton (2014), Nielsen and Wilhite (2015) Grier et al (2016), Welsh and Kühling (2016), Aliyev and Wagner (2017), Reimers et al (2017), Sunikka-Blank et al (2018), Mi et al (2018), Noel et al (2019) |
| Costly signalling theory | Individuals send honest signals about desirable characteristics and access to resources through costly displays, altruism or other behaviours that are hard to perceive directly. | Transport, food, residential energy, consumer goods, clothing | Griskevicius et al (2010), Zabkar and Hosta (2013), Brooks and Wilson (2015), Aliyev and Wagner (2017), Reimers et al (2017), Kohlko and Urban (2018), Puska et al (2018) |
| Critical theory | Social theory directed towards critiquing and changing the society as a whole and in the improved understanding of the society by integrating all major social sciences. | Transport | Gartman (2004) |
| Diffusion of innovations theory | The diffusion of innovation explains the process in which an innovation diffuses through communication channels across a population. Adoption of an innovation follows a curve, due to the normal distribution of innovativeness in the five adopter categories and the process of communicating and dispensing information throughout society. | Transport, consumer goods | Janssen and Jager (2002), Noel et al (2019) |

(Continued.)
Table 3. (Continued.)

| Theories                | Brief theoretical explanation                                                                                                                                                                                                 | Sectors                | Reference Article                      |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------|
| Domestication theory    | The approach developed by Silverstone (1994) in science and technology and media that describes the process by which innovations, especially new technology is 'tamed' or appropriated by its users and become in everyday lives. | Residential energy     | Winther and Bell (2018)                |
| Evolutionary Psychology | Perspective asserts that humans inherit brains and minds equipped to behave in ways that are adaptive—that are fitted to the demands of the environments within which their ancestors evolved. | Consumer behaviour     | Van Vugt et al (2014)                 |
| Hirsch’s status-seeking hypothesis | Goods and services that share some or all of the characteristics of positional goods (status-seeking) attract an increasing proportion of family expenditure as family income rises. | Consumer behaviour     | Brekke et al (2003)                   |
| Multi-dimensional approach to Corporate Social CSR | CSR comprises four main dimensions as a pyramid—economic dimension at the bottom—companies should 'make an acceptable profit', Philanthropic dimension at the top—companies should behave as good corporate citizens, Legal and Ethical dimension in the middle—companies should abide by laws and regulations, and avoid morally unacceptable behaviours and respect human rights, respectively. | Consumer goods         | Amatulli et al (2018)                 |
| Positional good         | Positional goods confer status on their users, but this benefit is offset by reduced status to others, resulting in little or no net benefit to the society.                                                                                                                                 | Transport              | Litman (2011)                         |
| Postmodernism theory    | The new post-modern society emerges in advanced capitalist countries and 'are increasingly characterized by diversity, differentiation and fragmentation, rather than homogeneity, standardization and the economics and organization of scale which characterizes modern mass society'. | Transport              | Gartman (2004)                        |
| Prospect theory         | In explaining monetary gains and losses, prospect theory captures human behaviour to code outcome perspectives as gains or losses relative to an individual reference point, by which decisions are anchored.                                                                                                                                 | Consumer behaviour     | Puaschunder (2017)                    |
| Social action theory    | Preferences and economic constraints are decisive determinants that point to social function of consumption and are linked to wider models of social action—namely, social status, attitudes and personal values.                                                                                           | Consumer goods         | Andorfer (2013), Lutzenhiser and Gossard (2000) |
| Social network theory   | Role of social relationships in transmitting information, channelling personal or media influence, and enabling attitudinal or behavioural change.                                                                                                                                               | Consumer goods         | Janssen and Jager (2002)               |

(Continued.)
| Theories                                      | Brief theoretical explanation                                                                 | Sectors                          | Reference Article                  |
|----------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------|
| Bourdieu’s social theories of consumption²  | **Social Reproduction.** The emphasis on the structures and activities that transmit social inequality from one generation to the next, comprising of economic capital, cultural capital, human capital and social capital. | Food                             | Costa et al (2014)                |
|                                              | **Theory of taste formation** Tastes are socially conditioned and objects of consumer choice reflect a symbolic hierarchy that is determined and maintained by the socially dominant in order to enforce distance or distinction from other classes of the society. | Consumer goods                   | Elliott (2013)                    |
|                                              | **Theory of cultural capital** Consumption is perceived as a game of distinction, in which different classes compete for culture capital or status honour. Cultural objects carry socially constructed meanings that testify to an individual’s class position. | Transport                        | Gartman (2004)                    |
| (Social) Practice theory                     | Theory focusses on routinized actions of social groups in forming the external influences on a person’s habitus or behaviour; individuals’ practices influence each other which both consequently influence the framing and narrative of the diverse practices in the sharing economy. | Transport, food, residential energy, buildings | Marx-Pienaar and Erasmus (2014), Sunikka-Blank et al (2018), Guyader (2018), Winther and Bell (2018) |
| Social theory (Weber’s)                      | Individuals wish to feel worthy of their positions in the society—demonstrated by class, status and power, and they wish to be convinced that they deserve their positions because of who they are and their qualities. | Transport, clothing              | Schimpfoss (2014)                 |
| Status characteristics                       | Interpersonal traits that influence the beliefs individual develop about each other’s capabilities and that—in a group with a shared goal—actors then ‘develop performance expectations of themselves and others on the basis of such traits’. | Consumer behaviour               | Zabkar and Hosta (2013)           |
| Structuration theory                         | Theory acknowledges the duality of the problem, that is the role of consumer knowledge that is required to make sense of, and to direct their daily activities as well as industry’s role in terms of efforts to mitigate climate change. | Food                             | Marx-Pienaar and Erasmus (2014)   |
| Symbolic interactionism                      | Analysis of how individuals build their world of understanding through interactions by examining how symbols are defined and used within social interactions and explaining how the social world changes through these interactions. | Food                             | Costa et al (2014)                |
on demand have received validation and relevance for the consumption of good and services in general.

As a key finding of our review, the theory of conspicuous consumption is the most referred theory, motivating how consumption decisions in daily life is influenced by the social advantage offered by the good or service and the consequent prestige the consumer gains. The theory is frequently referred to in transport related studies, where automobile purchases are classified as conspicuous purchases made to signal positionality or status. For example, the effect was observed by Grier et al (2016), where the relationship between consumption expenditure (on car purchases) to signal social status and marriage market conditions in China is examined. The pressure to consume conspicuously in order to remain competitive in the marriage market suggested an increased spending on cars as the sex ratio in the cities increase. With purchase behaviour favouring inefficient vehicles, the expenditure change resulting from conspicuous consumption is seen to generate negative externalities. In the continuous reconstitution of consumption hierarchies, Nielson and White (2015) map the rise of Tata Nano that was set to be the Indian ‘people’s car’, but falls short of achieving the standards of a ‘status symbol’ set by differentiation and distinction within classes and hence fails to keep up in the market. Conspicuous consumption motivations is found to positively effect high-carbon consumption behaviour in urban China (Mi et al 2018), increase the willingness to buy luxury brands (Amatulli et al 2018) and negatively influence sustainable luxury products (Aliyev and Wagner 2017), while also perpetuating inequality in socially mobile societies (Wisman 2011). However, the notion of conspicuous consumption received a different theoretical variation through conspicuous diffusion, that builds on the theory of diffusion of innovation (Noel et al 2019) and conspicuous conservation (Sexton and Sexton 2014, Welsch and Kühling 2016) allowing conspicuousness to be examined in the light of green (buying organic food) and pro-environmental (owning hybrid-car Prius) consumption behaviour.

The costly signalling theory was used to explain the positive and significant influence of status enhancement for green consumption—such as environmentally responsible clothing (Reimers et al 2017), and household consumer goods (Griskevicius et al 2010, Kohlova and Urban 2018). The willingness to behave environmentally conscious (Zabkar and Hosta 2013) or the preference for organic food products (Puska et al 2018) driven by status motives and reputational concerns also found its basis in costly signalling. The theory also lends support for why consumption-reducing behaviours (in travel behaviour, food choices, household energy behaviour) may be associated with low-status perceptions, but may change when accounted for varying contexts (Brooks and Wilson 2015).

Status seeking and transport demand is explained using several social and behavioural theories. Looking at the car beyond its immediate utility, Gartman (2004) draws on sociological theories of consumption such as Bourdieu’s theory of culture capital, Frankfurt School’s critical theory and postmodernism theories to demonstrate the interdependent dimension of an automobile that is entrenched in cultural consumerism bestowing it with meaning and identity. Extending behavioural effects to include status-seeking behaviour in explaining mobility choices, Mattauch et al (2016) argues for the inclusion of behavioural effects in designing transport policy and planning as well as in transport demand modelling that almost entirely assumes rational choice. Another aspect less explored in transport policy making is the implication of mobility as a positional good. Litman (2011) explains that transport choices made for its positional value may increase individual benefits at a cost to societal wellbeing, resulting in analysis of transport demand overestimating aggregate welfare gains. Practice theory proves valuable in investigating the ridesharing economy to categorize collaborative consumption revealing a consumerist style of consumption where participants seek status and convenience in their rides (Guyader 2018).

The pursuit of social distinction to obtain legitimacy in the society, as iterated by Weber’s social theory, lead to the Russian social upper class (in late 2000s) to rework previously prevalent taste and culture of ostentation to that of a less aggressive display of wealth. These are seen through consumption behaviour such as dressing down with ‘simple’ clothing and a changing attitude towards public modes of transport (Schimpfossl 2014). While, evolutionary psychology and environmental behaviour (Vugt et al 2014) help explain the existing psychological bias of status-seeking as a hindrance to pro-environmental consumer behaviour, status characteristic theory justifies interpersonal traits (statuses) as positive influencers of environmentally conscious behaviours (Zabkar and Hosta 2013). Contrarily, prospect theory by associating social status to ethicality demonstrates social status losses as significant drivers environmentally-conscious recycling behaviour and sustainable energy consumption (Puaschunder 2017). Critiquing Hirsch’s hypothesis, Brekke et al (2003) establish various degrees of relationship between status-seeking and consumption levels that are contingent on individual preferences for status versus non-status goods. Extending the link between status and energy consumption, Lutzenheiser and Gossard (2000) discusses the relevance of lifestyles in energy efficiency the environmental effects of the lifestyles differences. The arguments are grounded
primarily in theories of social action, conspicuous consumption and distinction.

The significance of social status on environmentally or ethically produced goods has received moderate attention. Theoretical considerations of Veblen and Bourdieu complementing models of social action explain the positive link between subjective social status and consumption of fair trade goods (Andorfer 2013), while Bourdieu’s theory of taste formation is used by Elliot (2013) to demonstrate that at green consumption suggests social status and distinction. By the virtue of taste, as treated by Bourdieu as its naturalness and not socially innocuous, status from green consumption is implied implicitly and subconsciously. More evidentially, Janssen and Jager (2002) link status-seeking to the transition to green products through its importance in the diffusion process. The model of social networks allowing for a cluster of peers that provide a sense of belongingness and the attribute of relative advantage in the innovation diffusion theory provide theoretical consideration to the importance of status.

Energy consumption in the residential and food sector has been reviewed for status effects through the theories of conspicuous consumption and costly signalling previously. Delmas and Lessem (2014) use behaviour theory on conservation to find that the public disclosure of conservation behaviour results in electricity consumption reduction, by way of encouraging a green reputation. Additionally, social practice theory and domestication theory provide grounds for reduction in electricity consumption through the use of in-home displays through status association made by households with the gradual domestication of the display (Winther and Bell 2018). In examining the role of symbols in the social world, Costa et al (2014) use symbolic interactionism and Bourdieu’s theory of social stratification to identify what symbols or social value is associated with organic food. By examining organic food as a symbol across social boundaries demanding capital, organic food is found to be consumed to signal social status, or identity. Likewise, the influence of status consciousness was found present in the purchasing fresh produce among the young consumers of South Africa (Marx-Pienaar and Erasmus 2014). The study uses structuration theory and social practice approach to test the role of the consumer’s knowledge and awareness in daily activities and the consequent impact on the climate and society.

6. Discussion and research gaps

Status by consumption has become a hallmark of postmodern society and is gaining relevance in the emissions versus wellbeing debate. An association, and in most cases positive, between green consumption and status has been found in environmental research (Griskevicius et al 2010, Welsch and Kühl 2016, Kohlova and Urban 2018). However, from the perspective of materialism, travel habits (to distant destinations) of a materialist, that are often emission intensive, are correlated with high status considerations (Andersson and Nääsén 2016). Brooks and Wilson (2015) examined the impact of contextual information on the perceived status of consumption-reducing behaviours, highlighting the significance of social acceptability of sustainable consumption. More recently, Ramakrishnan et al (2020) established status as a key social dimension that impacts the increase in household car and appliances ownership in urban India. Yet, the research on status in the context of energy use is only emerging and is often disjointed. A possible reason is the subjective nature of status that necessitates contextual understanding thus preventing an overall generalization. The terminologies used to explain or describe ‘status’ is evolving, and often leads to multiple phrases used to explain the concept. As a result, there is no standard measure of status that is accepted theoretically or otherwise.

A common thread across the most reviewed studies were theories that provided the basis for analysing status effects or significance. While some were explicit in the theories they use, others indirectly use the theories without obvious referencing. Certain theories such as the theory of conspicuous consumption, costly signalling theory, practice and behaviour theory were common to explaining the role of status for multiple end-use energy sectors. This allows comparison across sectors (using different methodologies) easy, and serves as evidence for future studies. However, this was not the case for other studies. Most theories were referred to by a single study (sector), limiting a detailed comparative analysis. But what it did exhibit was the wide theoretical base that is available for status to be investigated as a potential mitigation solution.

Although the evidence that the quest for status signalling and positionality influences household consumption choices is mostly consistent, it is difficult to quantify a standard magnitude of impact on the demand for energy embodied in the household goods and the effect on actual energy consumption and subsequent emission levels. Status ties up well with energy consumption (indirectly) through various correlations. Most evidenced in the transport sector, ‘status seeking’ is seen to increase car ownership by 5%–20%, while need for ‘status signalling’ increases the value of a hybrid car in the United States (US) between $400 and $4000. In promoting energy use reduction in the residential sector in the US, the pursuit of status or reputation leads to a 20% reduction in energy or increase willingness for low-carbon consumption behaviour by 0.81, while the loss of status positively drives sustainable behaviour. Organic food choices, examined for UAE and Finland, is strongly (60%–70%) associated with social
prestige. Social status signalling is found to have a stronger impact on greening products (2.5) amongst Czech adults than on high carbon conspicuous behaviours (0.23) by urban Chinese residents. Though the quantitative estimates have been tough to standardize for comparability, status is found to have positive effects on both high as well as low carbon consumption choices and behaviours.

An exploratory topic modelling revealed topics of ethical consumption and green signalling to be strongly associates with the term ‘status’. At the same time, topics of transport, urban housing, and organic food though distinct and intuitively relatable to status, did not have status in the top-ten highly associated words. This low association reflects the existing gap in literature of articles examining status in associated with consumption levels in the transport, housing or food sector. And so a prominent exclusion is the discussion around status-related decisions such as big houses and cars.

Section 6.1 delves deeper into literature, not captured through the search query but externally selected, on positional consumption in terms of cars and housing, highlighting the role of status in such consumption, particularly in high-income countries.

### 6.1. Positional consumption—housing and cars

A significant way through which individuals try to signal higher status is through the consumption of positional goods and services. The value of such goods depends on how they compare with goods owned and consumed by others, thereby allowing one to retain their social ranking in society (Frank 2005). Existing research has pointed to individual concerns about relative positions in life domains such as children's education, family healthcare, housing, and the value of car. Investigating the relative positional ranking of items, Solnick and Hemenway (2005) confirm the hypothesis that consumption goods such as housing (size) and clothing are more positional than health and safety. Carlsson et al (2007) find the value of a car to be more positional than its safety in case of Sweden. Given the positional ranking, to what degree is the good then consumed to meets basic needs and how much to meet positional needs?

As goods resulting in high energy consumption, housing and car ownership in comparison to other non-conspicuous items such as education, health and leisure allow us to examine the positional component in household energy consumption. Housing, when rented can be considered as shelter for necessity—the need for space. But home ownership can lead to housing being considered as positional to impart status. This association with home ownership was conceptualized as a positional good by Foye et al (2018). In examining the relative benefits of home ownership, Foye et al (2018) found positional concerns for home ownership significant for owners, but not for renters. This could be explained by the more materialistic trait of owners and their relative others as compared to the renters, as well as housing tenure serving as a relative wealth indicator more for owners than for renters. However, when conceptualizing home ownership as a social norm, the higher importance accorded to home ownership by relevant others increased the subjective wellbeing of homeowners and decreased subjective wellbeing of renters. Another aspect of living where housing considered as a positional good motivates people to buy bigger, more expensive home, is the marriage market (Wei et al 2012). That is owning a house, a visible wealth indicator, improves the perceived attractiveness or status in the marriage market (in China) compared to those who do not. This competition in marriage market in regions with high sex ratio triggers people to demand larger houses and is also seen to raise the housing prices.

Hirsch (1976) and Frank (2007) established that the size of the house is an important positional good, where in, the utility value of the house size depended strongly on the consumption of others. The positionality of housing was best illustrated through the thought experiment (see box 1) cited by Frank (2005). It was further lent to the preference for ‘Monster’ homes by residents of selected Chicago counties studied by Charles (2019), found that though monster homes in Chicago were moderately positional, but these homes were preferred for their aesthetics more than their size. Foye (2017) examines the relationship between the size of living space and subjective wellbeing for individuals through the value and activities that a living space facilitates and by way of the status it accords. This relationship is established by analysing the British Household Panel Survey implying that the size of living space is a positional good.

Understanding positional goods also entails a comparison of consumption in absolute (when the change in consumption is based on actual prior self-consumption level) and relative (when the change in consumption level is dependent on the consumption by others) terms. Leguizamon and Ross (2012) explore the importance of relative status by investigating the value placed on relative and absolute housing consumption through the revealed preference approach. Contrary to what stated preference surveys reveal, the evidence based on housing data of three US cities indicates that if all parties are handed an equal increase, the willingness to pay is higher for an absolute increase in house size than the increase in relative house size. As a policy implication, it suggests that competition reduction for higher relative status may be welfare enhancing, only until it does not negate absolute wellbeing.

Empirical evidence for hypothesis of varying degree of positionality in housing and cars is severely limited. Alpizar et al (2005) measured the degree of positionality for different goods by letting individuals...
made tradeoffs between their own consumption and relative consumption. They find the mean and median degree of positionality for cars and housing to be in between 0.5 and 0.75 (on a scale of zero to 1, where one indicates that the good is completely positional) implying that absolute consumption is also important. Carlsson et al (2007) while measuring people’s perception of relative consumption found that 50%–75% of a car’s purchase price or value is related to the positionality of the car, while vehicle safety counts for only 25%.

The role of affective and social motives, such as power and superiority, along with instrumental motives such as travel time, safety and costs have been significant in car use and ownership (Steg and Terwel 1999). The utility that people derive from larger, faster cars is an aggregate of direct utility from the car features and additional utility derived from the positionality of the car (Institute for Policy Integrity 2012). The purchase of high performing, luxurious cars over a low cost one is driven more by relative needs to signal status rather than for transportation needs (Verhoef and van Wee 2000). While bigger cars may provide functional advantages with comfort, the willingness to pay an additional premium for the additional engine power, expensive accessories and vehicle size would seem less likely in the absence of a status boost. This evidence was echoed by Hoen and Geurs (2011) who suggested that the attributes of size, engine capacity and interiors increase the positionality of cars in the Netherlands. An increase in positional competition would translate to a cost inflation, if newer cars were acquired to signal wealth and status.

At the same time notwithstanding the claim that cars are positional, Grinblatt et al (2004) uses Finnish data to argue for informational barriers as more important factors than behavioural influences. They find that households’ vehicle purchases are strongly correlated with the purchases by close neighbours but as a result of information sharing about the quality of the vehicle and the cost of owning it. They also find few evidence that purchasing behaviour is driven by the desire to conform or envy. The effect of social comparisons on car choices was noted by Narayanan and Nair (2011) in their analysis of the poster child for green envy—the Prius. They found that a one percent increase in the adoption of the Prius in the zip code increased the probability that the individual will purchase a Prius by 5.3%.

The policy implications that follow relative consumption is discussed by Frank (1985, 2008) and raises efficiency arguments in favour of progression income and consumption taxation. With car still recognized as a positional good—if more people end up buying larger cars, the absolute gain in the size of the car alone is insufficient to compensate for the reduction in overall wellbeing that results from congestion, higher air pollution and lower health benefits. Furthermore, the plausible impact of such consumption on global emission levels is seldom linked and understood.

**Box 1. Status-consumption externalities: Housing and Schools.**

Housing and schooling are major status items. Frank (2008) conducted a thought experiment about hypothetical trade-offs between world A, in which you will live in a 4000 square-foot house and others will live in 6000 square-foot houses; and world B, in which you will live in a 3000 square-foot house and others in 2000 square-foot houses. Frank argues that most people would choose the smaller house but with relatively better standing, in contrast to the classical utilitarian approach. The shifting frame of reference on what is an acceptable standard of home living—often determined by the wealthier households—accentuates the existing inequality in housing access, the most visible positional good. Leguizamon (2016) find the influence of the neighbour’s house size not significant in the lowest and higher income percentiles but in the mid-to-upper consumption groups that are willing to pay the highest for increase in relative status. When examined in context of families wanting to provide their children with education to compete in a ‘winner-takes-it-all’ society (Goldstein and Hastings 2019), it sets off a cascading ‘positional arms race’ for the bigger and better house, as also suggested by the positional competition thesis (Frank 2007).

Studies have adopted hedonic pricing frameworks to quantitatively evaluate the effect of school quality on housing prices (Wen et al 2014, Chin and Foong 2006, Leguizamon 2016). The premium parents are ready to pay on house prices increases with the quality of education offered in the neighboring schools (Davidoff and Leigh 2008). This pursuit of households wanting to send their children to good schools, result in them exceeding their budgets and spending more on housing. The positional externalities arising from such competitive consumption expenditures, as discussed by Frank (2008), often involve resorting to schools of below-average quality for middle-class households that fail to match up the spending, or reduced levels of subjective wellbeing in terms of longer working hours, lesser savings, and riskier jobs for households that do match the housing expenditure. If all households were to consume similarly, the outcome would be inefficient and welfare reducing. The consequence—a possible cycle of positional inequality induced income inequality that could starkly impact the future social mobility of children who...
cannot compete.

As status consumption thus realizes substantive externalities in wellbeing and economic outcomes, a case for policy intervention can be made. A specific proposal suggests that a progressive consumption tax would best limit status consumption without being prescriptive of what counts as status and what not (Frank 2008). Such as progressive consumption tax would have higher marginal tax rates for high annual consumption of individual tax payers, thus incentivizing savings instead (Frank 2008). At the same time, it would limit the economic externalities induced by buying oversized housing or vehicles.

7. Conclusion and future work

In this review, we identify 53 studies and examine these studies for trends, contexts and correlations between status and consumption (behaviour). A topic modelling of all documents confirms literature focus on transport, housing and food, with topics of conspicuous consumption, organic food, ethical consumption and urban housing increasingly gaining reference in literature from 2010 to 2019. Where applicable, the effect of status on consumption was mostly estimated using statistical and qualitative methods of analysis. This opens scope for exploring additional methods to better understand the nature and impact of status on end-use energy consumption and behaviour.

Our results demonstrate that status seeking has an effect on levels of end-use energy consumption. A suggestion for future research is to closely consider the impact of status effects emerging out of positional consumption on the actual energy and emissions levels. Changes in lifestyles (downsized) beyond meeting basic material needs, will require the collective works of institutional and societal power (Wiedmann et al 2020), individual attitudes and behavioural leaps (Hurst et al 2013), and stronger pathways to integrate sustainable consumption and production in daily consumption practices. This calls for disciplines including Economics, Psychology and Environmental sciences to explore, where linkages between energy and status seeking hold high research scope.

Another important direction of research can be on examining the policy implications of such consumption. Policies, such as carbon pricing, not only have a direct effect on marginal cost-benefit calculations, but also serve as signalling devices, communicating the social desirability or non-desirability of products. The welfare-enhancing effects of social status concern as examined by Rege (2008) or the classes distinctions driving political consumption (characterized by sustainability or social justice), such as FairTrade by Adams and Raisborough (2008) can extend learnings to leveraging status for conscious consumption. This raises important questions for economists, sociologists and political scientists in studying how to be support a status-aided transition to low-carbon products.

Our findings also have implications for cultural and religious leaders, and those observed as role models, in promoting values and communicating social norms closely linked with the nature of consumption. The relationships with sustainable consumption is examined for the goods marketplace by Holt (2012) and that between conspicuous motives and sustainable consumption by Hammad et al (2019) An adjustment of what is considered high status as communicated by social norms, especially in the case of major carbon emitting products, such as cars and floor-space intensive housing, is likely to have huge benefits for GHG emission reductions. As status is positional, net effects on the self-perception and wellbeing of citizens will be neutral. There will be however individual costs associated with such an adjustment. Sunk investments into the current set of high status products translates into opposition by the moneyed elite, who would like to maintain the culture of contentment through status displays (Galbraith 1993). The rate of adjustment is likely to vary across cultures and with regard to the economic changes in intertemporal trajectories, especially for emerging economies. This is an important area to explore further by the Environmental Humanities.

The understanding of status consciousness is limited in terms of energy implications of high carbon consuming goods such as bigger houses and large cars. Research on the positionality of such goods has recommended progressive taxation as a solutions to address welfare impacts on the society (Frank 2005). Importantly, we here make the case that big status items, such as housing and cars, have negative positional good effects on the economy, but also negative environmental externalities. Hence, a progressive consumption tax would capture two externalities at once, and thus become not only an instrument fostering societies with healthier social balance but at the same time systemically addressing climate change mitigation.

One caveat is that the higher costs of high consumption only increases the social desirability of these items. However, evidence suggests that price signals, if accompanied with social messages explaining the high costs of high consumption, crowds-in the desirable social attitudes and behaviour. For example, Ockenfels et al (2020) observe direct pricing or taxation underpinning moral behaviour surrounding consumption decisions with negative externalities. Price signalling to influence moral decision-making could have a similar effect on the consumption of positional goods. Nevertheless, there is insufficient research is out there to adequately understand the
dynamics at play between status and emissions through the demand for larger homes and bigger cars. This review could serve as an entry point to steer mitigation research in the direction.

Data availability statement

The data that support the findings of this study are available upon reasonable request from the authors.

Acknowledgement

Authors thank Max Callaghan for his constant support and guidance in using the Scoping Review Helper. AR would like to acknowledge the Deutscher Akademischer Austauschdienst (DAAD-57299294) for financial support.

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References

Adams M and Raisborough J 2008 What can sociology say about fairTrade?: class, reflexivity and ethical consumption Sociol. 42 1165–82

Al-Tale W A, Rahal M K M, Al-Sudani A S A and Al-Farsi K A O 2015 Exploring the consumption of organic foods in the United Arab Emirates SAGE 5 215824401592920

Aliyev F and Wagner R 2017 Green luxury: new divide in positioning strategies needed! Strategists—Shift Major Challenges of Today’s Economy (Bucharest) pp 585–94 (available at: www.wiwi-online.de/Literatur/Fachartikel/ 712/Green+luxury%3A+new+divide+in+positioning+strategies+is+needed%03F)

Alpizar F, Carlsson F and Johansson-Stenman O 2005 How much do we care about absolute versus relative income and consumption? J. Econ. Behav. Organ. 56 405–21

Amatulli C, De Angelis M, Korschun D and Romani S 2018 Consumers’ perceptions of luxury brands’ CSR initiatives: an investigation of the role of status and conspicuous consumption J. Clean. Prod. 194 277–87

Andorfer V A 2013 Ethical consumption in Germany: a cross-sectional analysis of determinants of fair trade consumption (2000–2010) Z. Soziol. 42 424–43

Blei D M, Ng A Y and Jordan M I 2003 Latent Dirichlet allocation J. Mach. Learn. Res. 3 993–1022

Bourdieu P 1986 The forms of capital

Brekke K A, Howarth R B and Nyborg K 2003 Status-seeking and positional goods Economica 74 586–98

Charles S L 2019 A quest for status or a desire to fit in? An examination of suburban ‘monster homes’ as a positional good J. Urban Aff. 41 486–502

Coleman P R 1983 The continuing significance of social class to marketing J. Consum. Res. 10 265–80

Costa S, Zepeda I and Sireix E 2014 Exploring the social value of organic food: a qualitative study in France Int. J. Consum. Stud. 38 228–37

Creutzig F et al 2018 Towards demand-side solutions for mitigating climate change Nat. Clim. Change 8 260

Creutzig F, Fernandez B, Habel R, Khosla R, Mulugetta Y and Seto K C 2016 Beyond technology: demand-side solutions for climate change mitigation Annu. Rev. Environ. Resour. 41 173–98

Delgado M S, Harriger J L and Khanna N 2015 The value of environmental status signaling Environ. Econ. 111 1–11

Delmas M A and Lessem N 2014 Saving power to conserve your reputation? The effectiveness of private versus public information J. Environ. Econ. Manage. 67 353–70

Eastman J K and Eastman K L 2011 Perceptions of status consumption and the economy J. Bus. Econ. Res. 9 9–20

Eastman J K, Goldsmith R E and Flynn L R 1999 Status consumption in consumer behavior: scale development and validation J. Mark. Theory Pract. 7 41–52

Elliott R 2013 The taste for green: the possibilities and dynamics of status differentiation through ‘green’ consumption Poetics 249 294–322

Foye C 2017 The relationship between size of living space and subjective well-being J. Happiness Stud. 18 427–61

Foye C, Clapham D and Gabrieli T 2018 Home-ownership as a social norm and positional goods: subjective wellbeing evidence from panel data Urban Stud. 55 1290–312

Frank R H 1985 Choosing the Right Pond: Human Behavior and the Quest for Status (Oxford: Oxford University Press) 350

Frank R H 2005 Positional externalities cause large and preventable welfare losses Am. Econ. Rev. 95 137–41

Frank R H 2007 Falling Behind: How Rising Inequality Harms the Middle Class (Berkeley, CA: University of California Press)

Frank R H 2008 Should public policy respond to positional externalities? J. Public Econ. 92 1777–86

Galbraith J K 1993 The Culture of Contentment (London: Penguin) 208

Gartman D 2004 Three ages of the automobile: the cultural logics of the car Theory Cult. Soc. 21 169–95

Geels F W, Berkhout F and Van Vuuren D P 2016 Bridging analytical approaches for low-carbon transitions Nat. Clim. Change 6 576–83

Greene D, Q.Calhagn D and Cunningham P 2014 How many topics? Stability analysis for topic models Machine Learning and Knowledge Discovery in Databases ed T. Calders, F Esposito, E Hüllermeier and R Meo vol 8724 and Knowledge Discovery in Databases ed T Calders, F Esposito, E Hüllermeier and R Meo vol 8724

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Guyader H 2018 No one rides for free! Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Griskevicius V, Tynber J M, Sundie J M, Cialdini R B, Miller G F and Kenrick D T 2007 Blatant benevolence and conspicuous consumption: when romantic motives elicit strategic costly signals J. Pers. Soc. Psychol. 93 85–102

Griskevicius V, Tynber J M and Van Den Bergh V D B 2010 Going green: stability and the perceived signals J. Pers. Soc. Psychol. 85 85–102

Griskevicius V, Tynber J M and Van Den Bergh V D B 2010 Going green: stability and the perceived J. Pers. Soc. Psychol. 85 85–102

Guyader H 2018 No one rides for free! Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Guyader H 2018 No one rides for free! Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Hammad H, Muster V , El-Bassiouny N and Schaefer M 2019 The quest for status or a desire to fit in? Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Guyader H 2018 No one rides for free! Three styles of positioning signals J. Pers. Soc. Psychol. 118 9–20

Emerald insight Emerald Insights 23 537–50 (available at: www.emerald.com/insight/content/doi/10.1108/JFMM-06- 2019-0115/full/html)
Heffetz O 2011 A test of conspicuous consumption: visibility and income elasticities Rev. Econ. Stat. 93 1101–17
Hirsch F 1976 Social Limits to Growth (Cambridge, MA: Harvard University Press) 208
Hoen A and Geurs K T 2011 The influence of positionality in car-purchasing behaviour on the downsizing of new cars Transp. Res. D 16 402–8
Holt D B 2012 Constructing sustainable consumption: from ethical values to the cultural transformation of unsustainable markets Ann. Am. Acad. Pol. Soc. Sci. 644 236–55
Hudson M, Hudson I and Edgerton J D 2013 Political consumerism in context: an experiment on status and information in ethical consumption decisions Am. J. Econ. Sociol. 72 1099–57
Hurst M, Dittmar H, Bond R and Kasser T 2013 The relationship between materialistic values and environmental attitudes and behaviors: a meta-analysis J. Environ. Psychol. 36 257–69
Institute for Policy Integrity 2012 Publications - Are passenger vehicles positional goods? Publications - Are passenger vehicles positional goods? Are passenger vehicles positional goods? Consumer welfar implications of more stringent CAFE standards (Institute for Policy Integrity) (available at: https://policyintegrity.org/files/publications/Are_Passenger_Vehicles_Positional_Goods.pdf)
Janssen M A and Jager W 2002 Stimulating diffusion of green products J. Evol. Econ. 12 283–306
Javid M A 2017 Influence of travelers’ attitudes, status and auto consciousness on car use reduction measures Jordan J. Civ. Eng. 11 11
Kim D and Jang S (Shawn) 2014 Motivational drivers for status consumption: a study of generation y consumers Int. J. Hospitality Manage. 38 39–47
Kohlova M and Urban J 2018 Green consumption signals altruism and elevated social status
Lee D D and Sebastian Seung H 1999 Learning the parts of objects by non-negative matrix factorization Nature 401 788–91
Leguizamon S J and Ross J M 2012 Revealed preference for relative status: evidence from the housing market J. Hous. Econ. 21 55–65
Litman T 2011 Mobility as a positional good: implications for transport policy and planning (miscellaneous) | ETDEWEB (Victoria Transport Policy Institute) (available at: www.osti.gov/etdeweb/biblio/21039933)
Lutzenhiser L 1992 A cultural model of household energy consumption Energy 17 47–60
Lutzenhiser L and Gossard M H 2000 Lifestyle, status, and energy consumption Proc. ACSEE Efficiency and Sustainability Summer Vol 8 pp 207–22
Marx, Piers N J M M and Erasmus A C 2014 Status consciousness and knowledge as potential impediments of households’ sustainable consumption practices of fresh produce amidst times of climate change Int. J. Consumer Stud. 38 419–26
Mattaucli L, Ridgway M and Creutzig F 2016 Happy or liberal? Making sense of behavior in transport policy design Transp. Res. D 45 64–83
Mi L, Yu X, Yang J and Lu J 2018 Influence of conspicuous consumption motivation on high-carbon consumption behavior of residents—an empirical case study of Jiangsu Province, China J. Clean. Prod. 191 167–78
Nielsen K B and Wilhite H 2015 The rise and fall of the ‘people’s car’: middle-class aspirations, status and mobile symbolism in ‘New India’. Contemp. South Asia 23 371–87
Noel L., Sovacool B K, Kester J and De Rubens G J 2019 Conspicuous diffusion: theorizing how status drives innovation in electric mobility Environ. Innov. Soc. Transit. 31 154–69
O’Cass A and Siahthiri V 2014 Are young adult Chinese status and fashion clothing brand conscious? J. Fash. Mark. Manage. 18 284–300
O’Toole J 2017 Why are the social sciences so important in tackling climate change? | ESRC Blog (ESRC blog) (available at: https://blog.esrc.ac.uk/2017/01/11/why-are-the-social-sciences-so-important-in-tackling-climate-change/) (Accessed January 2017)
Ockenfels A, Werner P and Edenhofer O 2020 Pricing externalities and moral behaviour Nat. Sustain. 3 872–7
Olanrewaju A, Tan S Y and Abdul-Aziz A-R 2018 Housing providers’ insights on the benefits of sustainable affordable housing Sustain. Dev. 26 847–58
Pachauri S and Spreng D 2011 Measuring and monitoring energy poverty Energy Policy 39 7497–504
Pauwender J M 2017 Ethical decision making under social uncertainty: an introduction to überetheticality Sustain. Prod. Consum. 12 78–89
Puska P, Karuki S, Lahdesmäki M, Siltaoja M and Luomala H 2018 Sweet taste of prosocial status signaling: when eating organic foods makes you happy and hopeful Appetite 121 348–59
Rai V and Henry A D 2016 Agent-based modelling of consumer energy choices Nat. Clim. Change 6 556–62
Ramakrishnan A, Kalkuhl M, Ahmad S and Creutzig F 2020 Keeping up with the Patels: Conspicuous consumption drives the adoption of cars and appliances in India Energy Res. Soc. Sci. 70 101742
Rao N D, Mao and Mastrucci A 2019 Energy requirements for decent living in India, Brazil and South Africa Nat. Energy 4 1025–32
Rao V 2001 Poverty and public celebrations in Rural India Policy Research Working Paper vol 2528 (January) (World Bank) pp 30
Rege M 2008 Why do people care about social status? J. Econ. Behav. Organ. 66 233–42
Reimers V, Magnuson B and Chao F 2017 Happiness, altruism and the prius effect: how do they influence consumer attitudes towards environmentally responsible clothing? J. Fash. Mark. Manage. 21 115–32
Schimpfoss E 2014 Russia’s social upper class: from ostentation to culturedness Br. J. Soc. 65 63–81
Schor J, Kanger L and Verbong G 2016 The roles of users in shaping transitions to new energy systems Nat. Energy 1 16054
Sexton S E and Sexton A L 2014 Conspicuous conservation: the Prius Halo and willingness to pay for environmental bona fides J. Environ. Econ. Manage. 67 303–17
Solnick S J and Hemenway D 2005 Are positional concerns stronger in some domains than in others? Am. Econ. Rev. 95 147–51
Steig L, Perlaviciute G and Ellen V D 2015 Understanding the human dimensions of a sustainable energy transition Front. Psychol. 6 1533
Steig L and Tertoolen G Transport Research Laboratory 1999 Affective motives for car use Centre for Environmental and Traffic Psychology COV P340 p 16
Stern P C, Janda K B, Brown M A, Steg L, Vine E L and Lutzenhiser L 2016a Opportunities and insights for reducing fossil fuel consumption by households and organizations Nat. Energy 3 45–53
Stern P C, Sovacool B K and Dietz T 2016b Towards a science of climate and energy choices Nat. Clim. Change 6 547–55
Sunikka-Blank M et al 2018 Harnesing social class, taste and gender for more effective policies Building Res. Inf. 46 114–26
Thaler R 1985 Mental accounting and consumer choice Mark. Sci. 4 199–214
Van Vugt M, Griskevicius V and Wesley Schultz P 2014 Naturally green: harnessing stone age psychological biases to foster environmental behavior Soc. Issues Policy Rev. 8 1–32
Veblen T 1899 The Theory of the Leisure Class; An Economic Study of Institutions (New York: The Macmillan Company) (available at: http://archive.org/details/theoryofleisure00veblala)
Verhoef E T and van Wee B 2000 Car ownership and status-implications for fuel efficiency policies from the viewpoint of theories of happiness and welfare economics
Eur. J. Transp. Infrastruct. Res. 3 15
Wei S-J, Zhang X and Liu Y 2012 Status competition and housing prices w18000 (Cambridge, MA: National Bureau of Economic Research) (https://doi.org/10.3386/w18000)
Welsch H and Kühlung J 2016 Green status seeking and endogenous reference standards Environ. Econ. Policy Stud. 18 625–43
Wiedmann T, Lenzen M, Keyßer I. T and Steinberger J K 2020 Scientists’ warning on affluence Nat. Commun. 11 3107

Winther T and Bell S 2018 Domesticating in home displays in selected British and Norwegian households Sci. Technol. Stud. 31 19–38
Wisman J D 2011 Inequality, social respectability, political power, and environmental devastation J. Econ. Issues 45 877–900
Yoon T, Cherry C R and Jones L R 2017 One-way and round-trip carsharing: a stated preference experiment in Beijing Transp. Res. D 53 102–14
Zabkar V and Hosta M 2013 Willingness to act and environmentally conscious consumer behaviour: can prosocial status perceptions help overcome the gap? Int. J. Consum. Stud. 37 257–64