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# Concerned consumption. Global warming changing household domestication of energy

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## HIGHLIGHTS

- Increased climate change focus has affected household domestication of energy.
- The changes produced concerns about energy consumption.
- Some energy saving activities were reported.
- Household energy cultures are less stable than anticipated.
- Suggests wider climate policy measures to motivate for energy efficiency.

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## ABSTRACT

This paper addresses possible effects of the growing focus on global warming on households' domestication of energy and the dynamics of energy consumption by comparing data pertaining to the domestication of energy within Norwegian households from two time periods: first, 1991–1995, when climate change was given little public attention, and, second, 2006–2009, after climate change became a major public concern. In the first period, we observed that the domestication of energy resulted in an energy culture emphasizing comfort and convenience with respect to everyday life and the abundant supply of clean hydropower. In the second period, this culture seemed to have changed, making households more concerned about their energy consumption. Consumption of energy was linked to climate change, and many interviewees claimed to save energy. However, the dominant expectation was still to be able to manage everyday life in a convenient and comfortable way. Thus, climate change concerns produced some but not very radical changes in the practical domestication of energy, including energy saving. A main effect was feelings of guilt, tempered by arguments regarding why change is difficult and complaints about political inaction. Thus, public engagement with climate change issues may facilitate energy efficiency policy but to succeed, wider climate policy measures seem to be needed.


## 1. Introduction

In most countries, there is an increased focus on energy saving in households because energy consumption is seen as a vital issue in climate change mitigation. This paper investigates how increasing public concerns regarding climate change may effect household consumption of energy, re-analyzing data from qualitative interviews and quantitative surveys. The data have been collected in Norway during the last two decades, and offers a rare opportunity to explore possible changes in energy cultures over a longer period of time. Such a study is important because of the widespread assumption that such cultures are rather resilient to change (see, e.g., Stephenson et al., 2010; Gram-Hanssen, 2011).

Norway should be an interesting context of this kind of analysis because, contrary to expectations driven by substantial population growth and increased levels of comfort, household energy consumption leveled out during the period we analyze (Aall, 2013). However, Aall (2013) offers only a few suggestions to explain this rather surprising finding, like increased energy efficiency of homes through energy saving technologies and refurbishment. This paper goes beyond such quantitative analysis by exploring the dynamics of households' domestication of energy that results in particular energy cultures – assemblages of knowledge, action, everyday life routines, norms and material objects (Stephenson et al., 2010) –

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focusing on the role of climate change concerns.

Norway also represents an interesting context for studying the extent to which climate mitigation issues transform people's relationship to and consumption of energy, because the country could be considered a hard case for such changes. For example, the level of security of supply has remained high, with fairly abundant resources of oil, gas and relatively cheap renewable hydropower. Nearly all Norwegian electricity is renewable and investments in new renewable energy have started to grow (Skjølsvold et al., 2013). Furthermore, since the late 1970s, energy efficiency has been on the political agenda with an increasing emphasis on the relationship between energy consumption and climate mitigation.

With regard to the public perception of anthropogenic climate change and the need for mitigation efforts in Norway, the situation is ambiguous. A majority of the population acknowledges climate change (Karlstrøm and Ryghaug, 2014), but there is widespread disagreement with respect to the seriousness of the situation (Ryghaug et al., 2011). Thus, while global warming is a widely recognized public concern, it is not clear how this affects household energy cultures, which shape the consumption of energy.

Previous studies have observed effects of public sustainability engagement. Karlstrøm and Ryghaug (2014) found that environmental concern influence decision-making with respect to household consumption of energy more strongly than economic issues. A similar finding is reported by DeCicco et al. (2015). Howell (2013) observed that climate issues were very important to people having adopted lower-carbon lifestyles, but with considerable diversity regarding what kind of climate issues that motivated them. Noppers et al. (2014) found clear links between perceived environmental qualities of sustainable innovations like electric cars and local renewable energy and the assessment and acceptability of such innovations. On the other hand, Sovacool and Blyth (2015) question the public's knowledgeability about energy and environmental issues, and thus problematize the idea that these issues actually are being linked. These contributions are important but more insight is needed into how households co-produce experience, concern and practice. We aim to contribute such insights, thus also providing knowledge that should be important to policy-makers trying to make household energy consumption more sustainable.

Traditionally, research on household energy consumption has framed this as mainly shaped by economic deliberations. It has focused on the effects of energy prices on consumption patterns, neglecting for example climate and other environmental issues. Another common framing of household energy consumption considers this to be basically a technological or techno-economic matter. This framing has also been found wanting (see, e.g., Guy and Shove, 2000: 63).

For our purposes, social science approaches are more relevant. They have been developed to overcome deficiencies of the economic and techno-economic understanding of the dynamics of household energy consumption. In particular, we are interested in how the influence of climate change concerns may be conceptualized. Some contributions focus on technology, innovation and (lack of) communication, stressing the importance of communicating about energy efficiency and new energy technologies rather than social and value concerns. A main finding is that experts misunderstand how households make decisions because they do not grasp consumers' logic of energy consumption (Heiskanen and Lovio, 2010; Hyysalo et al., 2013; Palm, 2013; Aune et al., 2016). This leads to the issue of how to comprehend this logic.

Scholars primarily concerned with barriers for energy efficiency tend to claim that there are only weak links between attitudes and practices. This suggests a lack of significant relations between total energy consumption and consumers´ value patterns, motives and problem perceptions, implying that climate change concerns will have little significance (Abrahamse et al., 2005; Slocum, 2004; Thollander et al., 2010; Throne-Holst et al., 2008). However, this lack of influence may depend on the way households' consumption of energy is regarded by the surrounding community. For example, some studies present development of so-called low-carbon communities as a potential solution to overcome persistent challenges in energy efficiency policy, like social conventions and the helplessness of individuals facing the enormity of climate change. Thus, living in a community valuing climate mitigation efforts may make households become engaged in sustainable energy practices (Aall et al., 2007; Barr and Gilg, 2006; Heiskanen et al., 2010). To understand the logic of household energy consumption, one may also analyze empirically the actual economic practices of energy use. Such research has highlighted the complexity of households' decision-making, emphasizing the importance of both economic and environmental motives (Aune et al., 2016; Biggart and Lutzenhiser, 2007; Winther and Ericson, 2013).

The most comprehensive framework for analyzing household energy consumption and energy efficiency practices draws on the concept of energy culture. This concept leads to a broad approach that includes, besides economic concerns, issues like values, household activities, acquired technologies, and everyday life routines. Thus, it takes on board many of the concerns of the other approaches. From the energy culture point of view, household energy consumption may only be understood through a contextualized examination of the interactions between norms, attitudes, material objects, and energy practices (Aune, 1998, 2007; Gram-Hanssen, 2010; Stephenson et al., 2010). This paper studies changes in Norwegian energy culture by employing domestication theory (Aune, 2007; Sørensen, 2006) to analyze our data. In the next section, we outline in some detail what this perspective entails.

## 2. Energy cultures and the domestication of energy: conditions for change

The energy culture framework implies that a realistic understanding of household energy consumption must consider such consumption to be enacted within a broad network of everyday life practices and infrastructures, including economic considerations (Aune, 1998; Shove, 2003; Southerton et al., 2004). Rather than a standard commodity, energy is a derived demand. In other words, energy is not used as such but as a consequence of other activities, including the employment of relevant technologies, such as cooking, cleaning, working or driving a car (see also Gram-Hanssen, 2011). Thus, the consumption of energy in a household is an effect of its energy culture, of the socio-material assemblage of the house and its artifacts and activities (Strengers et al., 2014). We use domestication theory to analyze this, a theory that has been developed to study the making and remaking of such assemblages (Sørensen, 2006).

Analyzing processes of domestication of technology or knowledge means to study the construction of practices and meaning as well as related processes of learning. The focus may be a piece of knowledge, an artefact or a set of artefacts, like those constituting the material objects included in an energy culture (Sørensen et al., 2000; Sørensen, 2006). In this paper, our main concern is how knowledge about human-made global warming and climate mitigation is enacted (or not) in everyday life and the extent to which this changes energy cultures. Such enactment may involve the articulation of positions with respect to the truth and falseness of knowledge claims, as well as consideration of how one should act on the perceived challenges: what to do – here, with respect to the