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Market, Money and Morals

The Ambiguous Shaping of Energy Consumption in Norwegian Households

Thesis for the degree of Philosophiae Doctor

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Norwegian University of Science and Technology
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Åsne Lund Godbolt

Introductory essay

Introduction

This thesis explores the energy consumption and energy efficiency efforts of Norwegian households. How do household consumers relate to energy consumption, and how do they make sense of energy efficiency issues? In order to understand the dynamics of household energy consumption and energy behavior mechanisms in relation to the surrounding context, I have investigated these matters (energy consumption, energy efficiency and the electricity market) from different angles and perspectives, representing policymakers, economists and household consumers. How do actors and elements influence the dynamics of household energy consumption? The four research papers, which make up the main part of this thesis, take different approaches to this area of concern that, together, draw a comprehensive picture of household energy consumption and energy efficiency.

The first article investigates the political constructions of household energy consumers: How are consumers expected to act in relation to electricity usage? The second article analyzes different framings of household energy consumption from the perspectives of both economists engaged in policymaking and consumers. How is the electricity market supposed to work, and how do people respond to this framing? The third article investigates whether climate change has influenced the domestication of energy consumption, and analyzes changes over time in Norwegian energy culture. Finally, the fourth article dives into the moral aspects of household energy consumption: How do people reason and argue when it comes to dealing with energy efficiency issues?

These different approaches to energy consumption and energy efficiency involve an analysis of the political-economic shaping of household energy consumption and an investigation of how households think and act in respect to their energy use. Thus, this thesis offers insights into energy efficiency issues, seen from

different vantage points, and explores the dynamics of policymakers', experts' and consumers' interference with energy consumption. The user perspective is essential to this comprehensive study of household energy consumption. How do people engage with energy consumption and energy efficiency in their everyday lives? How do they make sense of the energy market and their personal energy consumption? Can we observe changes in energy culture? Obviously, many factors contribute to shaping households' attitudes and actions with respect to energy use. To begin, let us consider the types of policy messages Norwegian households receive from their surroundings regarding these complex issues. What information are they presented with?

In Norway, a public enterprise called Enova, owned by the Ministry of Oil and Petroleum, was established in 2001 to push transitions towards energy efficiency and more environmentally friendly production and consumption.[1] One of Enova's main goals is to make it easier for households to choose suitable, energy efficient and climate friendly solutions. The tools used to achieve this are primarily economic support and professional advice to encourage upgrades in the energy efficiency level of private dwellings. So, what kind of recommendations are household consumers given to improve the energy efficiency of their houses and to make their energy consumption more environmentally friendly?

Enova claims to offer advice and financial support to consumers in order to make their homes even better places to live. Apparently, smart energy solutions can increase the comfort level of everyday life: "We all live in different homes, and we all live our lives differently. One thing we all can agree on is that comfort is important – especially in our own home."[2] Enova presents different stories of happy families who have made (technical and economical) efforts to make their houses more energy efficient and, consequently, enjoy the increased comfort of their homes. Here, energy efficiency efforts are mainly presented as measures for improved life quality. So, what are these smart energy solutions that will make

[1] http://www.enova.no/about-enova/about-enova/259/0/ (05.05.2014).
[2] http://www.enova.no/radgivning/privat/28/0/ (05.05.2014).

our everyday lives better? Let us consider, for a moment, a scenario in which you live in a regular house that was built in 1986. How can you improve the energy efficiency of this home?

A quick review of Enova's website uncovers some general advice for private households living in houses built earlier than 1987:[3] (1) insulate walls, floors and ceilings with an extra layer, (2) change the exterior door and change the windows to triple low-energy windows, (3) install a heating system that controls the indoor temperature in different zones of the house and regulates the temperature according to the time of day, (4) change the heating sources of the house (bio fuel/pellets and heating pumps are examples of energy efficient heating sources), and (5) invest in electricity saving equipment (lights or an energy saving shower head, etc.). If, in contrast, you live in a house that was built after 1987, the general energy efficiency advice is the same, except it is no longer recommended that you change the windows. Instead, Enova recommends that you install a ventilation facility with a heat recycling system.[4]

As this thesis demonstrates, energy efficiency proves to be a lot more complicated than what is portrayed in stories of comfortable homes and satisfied families. The practical advice that Enova provides is based on advanced technological knowledge; thus, the technical aspects of energy consumption and energy efficiency cannot be underestimated in studying how households make sense of these issues. It is not necessarily easy to figure out what to do and how to do it correctly – a point that is also made clear by household consumers. Furthermore, new technological energy solutions are not free. For instance, following Enova's advice and fulfilling these energy efficiency efforts in your house would actually cost you a lot of money. For this reason, the current political discussion in Norway emphasizes tax incentives for energy efficiency efforts. What policy message does this proposal suggest?

[3] http://www.enova.no/radgivning/privat/energismarte-rad-for-din-bolig/gammel-boligfor-1987/148/0/ (05.05.2014).
[4] http://www.enova.no/radgivning/privat/energismarte-rad-for-din-bolig/nyere-eneboligetter-1987/142/0/ (05.05.2014).

According to the most important Norwegian organizations in the environmental movement, the building industry and the co-operative housing movement,[5] Norwegian households should get a tax deduction for conducting energy efficiency efforts. This proposal points to the very high level of renovation in the Norwegian housing market (Norwegian households spend more than 60 billion NOK each year to maintain and upgrade their dwellings)[6] and claims that a tax deduction would push more of these investments in an energy efficient direction. From this point of view, which is also shared by the conservative government of Solberg (2014)[7], the consumer is supposed to orient herself in the energy market to search for smart energy solutions that qualify for tax deductions. In this way, the political proposal argues, it should be easier and more economically profitable for households to invest in energy efficient technologies.

Norwegian energy companies also support the following message of economic profitability: if people are energy efficient – or even if they are not (and are simply regular energy consumers) – they should save money. A quick review of some of the websites of the largest energy companies shows that energy consumption – or, in this case, electricity usage – is framed in terms of economic profitability and, to a certain degree, supply security (Hafslund;[8] Norges Energi;[9] Nord-Trøndelag Elektrisitetsverk[10]). Obviously, people are supposed to have electricity available when they need it, but, most of all, energy companies emphasize that consumers should feel certain that they are paying the lowest price available for their energy. From this perspective, consumers are expected to behave as rational actors on the energy market, following the dynamics of price mechanisms and changing their energy suppliers frequently in order to

[5] Forslag til skattefradrag for ENØK (notat), Oslo 24. februar 2014: Norske Boligbyggelags Landsforbund, Bellona, Naturvernforbundet, Zero Emission Resource Organisation, Byggenæringens Landsforening og Norsk Teknologi.
[6] Approximatly 7.5 billion Euros.
[7] Forlag til skattefradrag for ENØK (notat), Oslo 24. februar 2014.
[8] http://www.hafslund.no/strom/privat/forsiden/2010 (05.05.2014).
[9] http://www.norgesenergi.no (05.05.2014).
[10] http://www.nte.no/index.php/no/ (05.05.2014).

reduce their electricity expenses. According to the energy companies, it is easy and free to switch electricity suppliers: "Cut your electricity expenses now!"[11]

As is evident, the policy messages to household energy consumers are rather ambiguous. Enova presents energy efficiency efforts as mainly measures for improved life quality. From this point of view, increased comfort is an important motivation for investment in smart energy technologies. However, policymakers and energy companies seem to focus more strongly on the economic benefits that energy efficiency might provide. If Norwegian households were to be offered a tax deduction for conducting energy efficiency efforts in their house, policymakers argue that it would be economically profitable for households to invest in energy efficient technologies (and thus attractive for them to do so). The energy companies support this message of economic rationality: household energy consumers should save money when dealing with energy consumption.

So how do households respond to these ambiguous policy messages concerning energy efficiency and energy consumption? What is more important to household consumers when making energy decisions in their everyday lives: money or comfort? How can household consumers be motivated to engage in energy efficiency efforts? In order to build a better understanding of the surroundings of Norwegian household energy consumption, we should take a quick review of the Norwegian energy situation. What is the context of Norwegian household energy consumption?

The Norwegian energy situation is characterized by the dominance of renewable hydropower and by a large national income from the export of oil and gas. Energy saving, or "energy economizing" (ENØK), as it has been called in Norway, has none the less been on the agenda since the mid-1970s. It was first introduced by a governmental report in Norway in 1975 as a political strategy to meet the concern over future electricity shortages. This fear was a result of the ongoing shift from an oil-based energy system to an electrical energy system, related to the high oil prices that had sprung from the oil crisis (Næsje 2000). Since 1975,

[11] http://www.norgesenergi.no (05.05.2014).

energy economizing as a policy instrument has gone through different stages of motives and means. The main tendency, however, has been to emphasize the ideal of economic rationality, dubbed by Ryghaug and Sørensen (2009: 985) as the "iron cage of economics." Materially, Norway has first and foremost been geared towards energy export and economic profit, whereas, in most other countries, energy security has been of comparatively greater concern (Skjølsvold 2012).

In 1990, Norwegian legislators introduced the New Energy Act and the Norwegian electricity market became one of the first to be deregulated in Europe. In many ways, the deregulated Norwegian electricity system appears to have been a success story: "Based mostly on hydroelectric power from the country's many waterfalls, Norwegian electricity is abundant, clean and above all cheap to produce" (Karlstrøm 2012: 9). However, in 1996, Norway entered a common energy market with Sweden – and later with Denmark and Finland – based on Nordic electricity exchange (Nordpool). This development presented consumers with a new market situation in which, for instance, electricity generated from Norwegian hydropower could be exported, while electricity from nuclear power plants in Sweden and coal fired energy plants in Denmark could be imported.

The liberalization of the energy market in the early 1990s changed energy supply and, also, potentially changed the role of energy users. Energy evolved from a good that had been delivered at a reasonable and stable price to a market commodity, and users became consumers in that market. Consequently, users were expected to develop an interest for energy efficiency and energy saving, because this was seen as the economically rational and beneficial thing to do. Around 2005, climate issues also entered the public energy agenda in full strength, and the public discourse emphasized the moral obligations of the single individual to act to mitigate the climate problem; this was especially voiced by politicians through mass media. Hence, consumers were expected to save energy through acting as economically rational and moral actors.

Statistically speaking, energy use among households has actually levelled out since 1990, despite the fact that population growth and consumer spending have seen somewhat higher increases than were predicted (Hille et al. 2011). Today, most of the energy used is hydroelectricity. Norwegian households are largely heated by panel ovens and electric floor cables, and stoves and hot water are also heated electrically (Skjølsvold 2012). According to Hille et al. (2011), the total temperature-adjusted energy use in Norwegian year-round residences increased by 3% during 1990–2009 (from 42.2 to 44.9 TWh), while energy use during the previous 20-year period (1970–1990) increased by 55%. If the development in energy use for the period 1990–2009 had followed the trend of 1970–1990, the energy use in 2009 would have been 73 TWh (Hille et al. 2011). What are the reasons for this unexpected reduction in household energy use?

Hille et al. (2011) present some suggested partial explanations for this reduction by 30.8 TWh (42%) in relation to the expected trend in energy use. Firstly, Hille et al. (2011) suggest that the most significant reason for the levelling out of energy use is the slower increase in building size. This change in per capita living area is probably due to the fact that immigrants from non-Western countries have constituted as much as 61% of the population growth (2001–2009). Furthermore, there has been a considerable increase in real estate prices and real interest rates. The second explanation involves changes in energy use per square meter. According to Hille et al. (2011), the most critical factor in this reduction is incremental energy saving measures (as opposed to complete renovation) related to improvements in the building envelope of older residences. Equally responsible is the implementation of heat pumps and the subsequent reduction in heat loss as a result of increased heating efficiency (mainly due to the phasing out of household furnaces).

However, Hille et al. (2011) emphasize that, because of a substantial knowledge deficiency concerning energy use in Norwegian households, they have not managed to come up with an overall explanation for the levelling out of energy use after 1990. This knowledge deficiency is related to measurements of total living area, dwelling renovations, indoor temperature, hot water consumption

and use of electrical equipment, as well as the purpose of energy use in cottages. Moreover, as Hille et al. (2011) put it: "The lack of knowledge is even more evident when considering the underlying factors deciding energy use, among which consumer behavior mechanisms constitute the largest knowledge deficiency" (p. 16). They claim that we know little about the effect of changes in behavior, in the sense that we do not know the extent to which behavior has influenced development, as a whole. What we do know, Hille et al. (2011) argue, is that behavioral differences may have a great impact on an individual level. How can we understand the underlying factors that determine household energy consumption?

In 2013, Ipsos MMI, on behalf of the Norwegian Research Council (NFR), carried out a survey that charted the type of knowledge Norwegian consumers asked for in energy and climate research. The survey demonstrated that 50% of consumers were concerned or very concerned about climate change, while 81% claimed that humans influenced the climate on Earth quite a lot or very much. How do people relate to these concerns? For the first time, the Norwegian Research Council invited the public to participate in defining and deciding the type of research that the field of climate and energy research would provide. "The people's climate research," which this research program was named, points to some highly relevant research questions that emphasize both practical, political and moral aspects of energy consumption and climate change (Folkets Klimaforskning 2013):

- What type of effects can be obtained from efforts made by individuals to antagonize climate change (for instance, recycling)?
- How can a system be implemented so that a consumer can see the climate consequences of practices and product use?
- How can we make sure that all the countries in the world take responsibility in the fight against global warming?
- How can we influence Norwegian society to reduce oil extraction?

The above questions were found to be important to the public when dealing with these complicated issues in their everyday lives. How can changes be made, both on an individual level and on a global scale? Obviously, my thesis does not give full answers to these overarching research questions. Rather, I choose to see them as a reminder of how people make sense of energy consumption and energy efficiency. These research questions were defined some years after I did my focus group interviews. However, I am not surprised by the outcome of this survey. The questions defined by the public in 2013 reflect many of the concerns my informants expressed in the focus group interviews in 2009 regarding energy consumption and climate change: Do my energy actions matter? How do I know what to do? What about other actors – industry and foreign countries? These complex considerations will be discussed in the following four articles.

Despite the pessimism and powerlessness related to the status quo of energy consumption – often expressed by household consumers and other actors when dealing with energy efficiency – Hille et al. (2011) show that we may be optimistic in our outlook, since household energy consumption has levelled out since 1990. After all, maybe there is room for still more energy efficiency and reduced energy consumption. However, this observed change in energy consumption is not easily explained. How has energy consumer behavior influenced this development? What elements have contributed to the reduction of energy consumption in households?

According to the survey of NFR (Folkets Klimaforskning 2013), most consumers do care about climate change and want to know what they can do on an individual level to help solve the energy problem. Nevertheless, they also address changes carried out by policymakers and industrial actors on a societal level, and point to moral considerations concerning the responsibility share of acting on environmental challenges. This thesis will look into these matters and investigate how rationalities of comfort, convenience, fairness, economics and climate change influence household energy consumption. What role do these rationalities play in consumers' interference in the electricity market and their framing of energy efficiency? The four research papers deal with these complex

issues from different points of departure. How may we proceed to understand the mechanisms of energy consumer behavior?

The thesis is structured as follows: In the next section I give a brief summary of each of the four articles, explaining the theories and topics discussed without going into much detail. Then, I present previous social studies of energy consumption and energy efficiency that have tended to focus on various barriers to achieving energy efficiency in households. In order to move beyond the barriers and explain the dynamics of energy efficiency, I introduce the theoretical framework that informs my analysis of household energy consumption. I start with a presentation of co-production, actor-network theory (including the concepts of "program" and "framing") and domestication theory, before I dive into the cross-cutting analysis that discusses the relevant research questions and findings that span the articles. What is there to learn from a re-reading of the four papers? Is there a shared story? I then move on to a description of the methods of data collection and analysis. Finally, the four papers are included, which investigate household energy consumption and energy efficiency from different angles and perspectives.

Energy consumption from different angles: a summary of the papers in the dissertation

The first article examines the way in which Norwegian policymakers domesticated economic theory when constructing energy household consumers over 30 years of official policymaking. It answers the question: How are household consumers expected to act in relation to electricity consumption? The second paper investigates how energy consumption is framed, from the perspective of both energy economists engaged in policymaking and household consumers. It analyzes, especially, household consumer responses with respect to the intentions of the electricity market, and examines the ways in which consumers view themselves as market actors (or not). The third article looks into the dynamics of energy consumption and energy efficiency over a period of two decades, and compares Norwegian energy cultures in two different periods:

the early 1990s and the late 2000s. The article addresses the question: Has global warming changed the domestication of energy consumption? Finally, the fourth article explores how people make sense of their energy consumption and energy efficiency efforts through the concept of "ethos," which refers to a set of guiding beliefs or values. It asks: How do people explain their actions with respect to engaging (or not engaging) in energy efficiency?

Paper 1: Consumers as Professional and Political Constructions. On the Performativity of Energy Economics (Karlstrøm, Sørensen and Godbolt)

This paper investigates how policymakers constructed an idea of the typical electricity consumer over 30 years of official policy on electricity consumption. By examining official policy documents, we gain an impression of how consumers are supposed to think and act under the new policy regime. In this analysis, we discuss Michel Callon's theory of the performativity of economics, which assumes that economics is performative – in the sense that it shapes economic actions in the image of economic theory. Have Norwegian policymakers domesticated economic theory when dealing with official policy for energy efficiency in households, and thus provided for a homo economicus, as well as an energy saving, governmentality?

In this paper, we examine government white papers, legal documents and corresponding parliamentary debates to analyze the ways in which Norwegian households have been conceptualized in relation to the market behavior anticipated by economic theory and the relative role of professional economic knowledge and political experience. In an analysis of the period since 1975, we identify three distinct ways of conceptualizing the household consumer as part of the introduction of three key electricity policies related to: the so-called oil crisis, the deregulated electricity market and the crisis of electricity supply. A main idea is that energy policy, in important ways, is shaped by the underlying understanding of consumers. How have policymakers constructed energy household consumers?

The paper demonstrates how the construction of household consumers changed over the 30-year period analyzed. First, in the wake of the oil crisis, there were two conflicting constructions in one: consumers were seen as economically rational in the policy documents, but policymakers did not completely trust consumers to act in economically rational ways, and thus kept invoking knowledge and moral deficits in the parliamentary debates. There was relatively little controversy regarding this framing. In the second period, starting with the deregulation process in the beginning of the 1990s, the center-right government constructed consumers in the image of homo economicus, while the opposition put forward a construction that emphasized consumers' right to buy electricity at a "reasonable" price and portrayed consumers as needing paternalistic care. After the energy supply crisis in 2002–2003, policymakers turned their attention to the utility companies that had failed to invest in new production. In this last period, we observe an additional, shared construct of the policymakers: the household consumer as an investor in alternative energy technologies.

These findings do not support any strong versions of the performativity of economic theory. While economists played a vital role in designing the liberalized electricity market in Norway (Karlstrøm 2012), only for a while did a majority of the policymakers trust the new calculation devices of a liberalized market to achieve a balance of supply and demand in the way that economic theory assumes. Obviously, policymakers observed that household consumers responded to the deregulated electricity market in a different way than was expected by the economists, and thus corrected their consumer constructions accordingly. Therefore, we find that performativity is, at best, context-dependent when policymakers frame consumer constructions.

Paper 2: Mismatch or Misunderstanding? Economists and Consumers Framing Electricity Consumption in a Deregulated Market (Godbolt, Aune and Sørensen)

This paper analyzes how economists engaged in energy policymaking and how household consumers framed energy consumption, particularly with regards to electricity and the electricity market. First, we show that the main intention behind the deregulation of the electricity market was to make the system of energy production and distribution more economically efficient. During this transformation process, economists were primarily concerned with utility companies. Assuming utility companies fulfilled their role as retailers, household consumers were thought to benefit from deregulation. By receiving sufficient information and good service, consumers were expected to act in an economically rational manner and to use their consumer power to choose the most favorable supplier. In this way, they were expected to exercise control of their expenses. Consequently, we observed household consumers to be framed as homo economicus.

Furthermore, the paper demonstrates that energy efficiency concerns did not appear to be important in the considerations made with respect to the deregulation of the electricity market. However, the lack of explicit focus on energy efficiency may also be explained by the reasoning around the dynamics of the consumption and price of electricity. The predominant homo economicus framing implied an assumption that, in the long run, consumers would consider their energy costs and invest in energy efficiency measures and/or save electricity. In this way, energy efficiency would result from more or less complex calculations regarding electricity bills, investments to increase energy efficiency in homes and utility gained from consuming electricity. Consequently, energy efficiency behavior was taken as part of calculation efforts prompted by the deregulated market and the provided information about costs and prices.

From the economists' perspective, household consumers were supposed to be free and informed in the deregulated electricity market. Contrary to this economic perspective, household consumers emphasized transaction costs, trust and collective fairness when framing energy consumption. Their framing appeared as much more complex and heterogeneous than the framing represented by policymakers. To begin, they gave the impression that energy costs mattered and that saving money was the main motivation for saving energy. Thus, their framing did not seem to be the result of any misunderstanding related to the way in which markets were supposed to work, at least not in general terms. However, we characterize the consumers as homo economicus "wannabes," because elements other than economic considerations seemed to be more important in their framing of energy consumption.

As the analysis demonstrates, many of the interviewees found it difficult to navigate the electricity market. Moreover, the transaction costs of staying informed were considered too high, since the potential gain was so small. Furthermore, the consumers' low level of trust with respect to the electricity market hampered their perceived ability to act. They considered the price of electricity beyond their influence, and thus chose not to bother. Also, the fact that they viewed electricity as a public good contributed to an externalization of calculations based only on costs, utility and other economic variables.

Most importantly, the analysis demonstrates that moral issues were internalized in consumers' framing of household energy consumption and the electricity market (in contrast to the economists' framing). The focus group participants came to engage with what Cochoy (2008) labels "qualculations," related to trust and fairness. This framing of energy consumption and the electricity market, emphasizing moral arguments, should be considered in relation to the increased focus on global warming. The analysis shows that climate concerns and consumers' moral framing of energy consumption were co-produced. In this way, focus group participants shifted between calculation and qualculation, between a cost frame and a moral frame.

Paper 3: Concerned Consumption. Global Warming Changing the Domestication of Energy? (Godbolt, Aune, Sørensen and Ryghaug)

Based on data from several interview studies and surveys, this paper investigates Norwegian energy cultures over a period of two decades. It focuses on the ways in which users understood energy consumption in two periods: 1991–1995 and 2006–2009, when climate change rose to the top of the public agenda. Did the widespread acknowledgment of human-made global warming change the domestication of energy? In our analysis, we draw on a social scientific frame of energy culture, which implies that consumer energy behavior can be understood by examining the interactions between cognitive norms, material culture and energy practices linked to wider systematic influences of behavior (Aune 2007, 1998; Gram-Hanssen 2010; Owens and Drifill 2008; Stephenson et al. 2010; Young and Middlemiss 2011). Theoretically, the analysis builds on a socio-technical approach – more specifically, domestication theory (Sørensen et al. 2000; Sørensen 2006). Accordingly, we demonstrate how the domestication of energy-related artifacts and knowledge in households results in energy cultures.

The paper investigates how the issue of global warming and national discussions related to energy supply influenced consumers' reasoning and practices with respect to energy consumption and the organization of everyday life. First, we study the symbolic, sense-making aspects of energy, as accounted for by the interviewees. Here, we find that, in the early 1990s, climate change issues were barely mentioned. At this time, Norway was considered rich in energy resources – not the least with respect to clean hydroelectricity. Energy saving was considered important by a few, but mainly because they were concerned with minimizing waste. Thus, energy use was not perceived as a problem in this first period.

In the second period, however, energy consumption was rendered more problematic. To a certain degree, people were aware of the fact that Norway also imported less clean energy sources (relative to hydropower) from other

countries. Concerns about climate change became much more prominent in the late 2000s, making energy consumption more problematic. Still, due to several moderating influences that are discussed further in the paper, there was no complete transformation with respect to the way energy use was considered. Hence, we show how energy consumption, above all, became a matter of concern in the second period, compared to the first period, in which energy was considered more "innocent."

Furthermore, by studying people's accounts of their practices and their resulting narratives about energy consumption, the paper investigates whether energy consumption practices were modified over these two periods. Apparently, as a consequence of the ambiguous sense-making of energy consumption, domesticating climate knowledge into energy saving practices was considered difficult, and happened only on a fairly modest scale. Because of the increased emphasis on the need for climate change mitigation, energy consumption caused feelings of guilt in the last period studied. However, despite this tendency of concerned consumption, the paper finds that the comfort- and convenience-oriented energy practices in everyday life were rather stable.

Paper 4: The Ethos of Energy Efficiency (Godbolt)

The final article in this thesis deals with the moral aspects of household energy consumption and energy efficiency in the late 2000s. Based on focus group interviews from 2009 and domestication theory (Sørensen et al. 2000; Sørensen 2006), the paper maps and discusses the arguments that people drew upon when they were asked to account for how they used energy in their homes. How did they navigate different concerns, such as cost and comfort, when confronted with expectations of increased energy efficiency in their households? From a user-centered perspective, I analyze how people explained their actions with respect to engaging (or not engaging) in energy efficiency measures in their homes.

The paper explores how people made sense of their energy consumption and energy efficiency efforts through the concept of "ethos," which refers to a set of guiding beliefs or values. By studying the ways in which people domesticated energy efficiency issues, important elements of the ethos of energy efficiency are identified and analyzed. The paper demonstrates that, rather than focusing on economic motives (as expected by the policymakers), people domesticated energy efficiency in dialogue with their ethos of energy efficiency – especially in relation to the symbolic dimension of energy use, which is co-produced with the ethos. The ethos of energy efficiency consists of four partly conflicting moralities concerning: (1) saving, (2) needs, (3) merit and (4) entitlement, with respect to energy use.

In my analysis, I show how these four moralities provided interviewees with arguments related to their decisions on energy consumption and efficiency, and how the moralities moderated each other through the diverse calculations or qualculations (Cochoy 2008) made by the interviewees. The morality of saving, which emphasizes thriftiness, argues that energy saving is crucial for economic, as well as for environmental, reasons. This argument was first moderated by a morality of merit, through which efforts to save energy in some areas were said to merit relative wastefulness in others. Second, the morality of saving was hampered by a morality of needs, as demonstrated by the argument that people lack possibilities for saving energy. Finally, interviewees argued that access to plentiful energy is a self-evident privilege; this latter argument represents a morality of entitlement, which also moderated the morality of saving. In addition to these conflicting sets of arguments, a final moderating factor for energy saving was the externalization of the responsibility to act.

Together, these four papers emphasize the challenges in understanding the dynamics between energy policy and energy household consumption. How do the values, beliefs and practices of energy household consumers interplay and relate to energy policies? Furthermore, the papers explore the processes of domestication within the household: How is energy consumption and energy

efficiency made sense of and acted upon by household consumers? In the following, I present previous studies on energy consumption and energy efficiency that offer insight into these matters. Traditionally, economics and environmental psychology dominated this field, but, since these approaches tend to externalize socio-cultural dimensions of energy use, my thesis seeks alternatives to this research. Accordingly, I focus on social studies that provide us with more comprehensive understandings of attitudes and behaviors. Subsequently, I turn to theoretical perspectives from science and technology studies to analyze the dynamics of household energy consumption and energy efficiency.

Frames of social studies of household energy consumption

Although energy efficiency has improved considerably over recent years, the European Union (EU) assumes that it is technically and economically feasible for such efficiency to progress further by using different strategies across all active sectors. According to the EU, buildings represent the most promising target for energy efficiency improvements. Despite the fact that occupant behavior is a major determinant of energy use in buildings, the energy saving potential of behavior is often neglected or considered unimportant, relative to the energy saving potential of technology (Lopes et al. 2012). How can social science research provide us with different approaches to understanding and conceptualizing energy efficiency as a social issue?

Lopes, Antunes and Martins (2012) argue that energy behavior represents a significant untapped potential for the increased end-use energy efficiency in buildings. Further, they claim that most of the research on energy behavior has been essentially focused on the residential sector, and less has been focused on service buildings. The majority of these contributions have come from environmental psychology – first and foremost by Steg and Vlek (2009), who identify motivational, contextual and habitual issues as the most important factors in environmental behavior. However, because it has traditionally focused

on the individual perspective, environmental psychology has often failed to examine contextual influences on energy behavior.

While environmental psychology mainly addresses behavioral factors, economics assumes individuals are fully rational actors who make calculated decisions and actions. Therefore, economic strategies correct market failures by providing information, securing capital for investments and so forth. On the other side, whereas psychology and economics focus on individual behavior, sociology proposes that energy demand is not only originated by the individual, but is also a social construct. Energy behavior strategies (e.g. social learning, collective actions, etc.) must therefore take such perspectives into consideration in order to be effective (Lopes et al. 2012). How can one achieve this?

Lopes et al. (2012) propose a variety of approaches to energy efficiency: first, disciplinary approaches related to economics, psychology and sociology; second, methodological approaches, traditionally distinguished between quantitative and qualitative approaches; third, ontological approaches to energy efficiency, which refer to the underlying understanding of what actually constitutes an object of energy efficiency. Further, they propose welding these approaches into an overarching interdisciplinary framework.

While the multidisciplinary argument is tempting, I choose to use a more fine-meshed differentiation than that of Lopes et al. (2012). In order to assess the possibility and potential for multidisciplinary perspectives on energy consumption, I lean on the concept of framing (Goffmann 1971). In a traditional sociological setting, framing is a way of analyzing how actors produce and define interaction with other people, more or less independently of their surrounding context. Goffmann emphasizes the dual nature of this framing process: it presupposes commitment among actors who represent cognitive resources and forms of behavior that have been shaped and structured by previous experience, and, at the same time, root the process of framing in the outside world (Callon 1998). According to Goffmann (1971), the frame is, in many ways, a product of the interaction between actors and their networks of connections to the

surrounding context. In the following, I use the concept of framing to categorize different perspectives on energy use, energy behavior and energy efficiency.

Throughout the literature review, I identify the following frames: (1) economic sociology, (2) community focus, (3) technology, innovation and (lack of) communication, (4) barriers and (5) energy cultures. In the frame of economic sociology, I place Biggart and Lutzenhiser (2007), Ek and Söderholm (2008, 2010), Thøgersen et al. (2010) and Winther and Ericson (2013). Aall et al. (2007), Barr and Gilg (2006) and Heiskanen et al. (2010) give their contributions to the frame of community focus. In the frame of technology, innovation and (lack of) communication, we find Heiskanen and Lavio (2010), Hyysalo et al. (2013) and Palm (2013). Further, I place Abrahamse et al. (2005), Carlsson-Kanyama and Lindén (2007), Slocum (2004), Thollander et al. (2010), Throne-Holst et al. (2007) and Vringer et al. (2007) within the frame of barriers. Finally, in the frame of energy culture, we find Aune (1998, 2007), Gram-Hanssen (2010), Owens and Driffill (2008), Stephenson et al. (2010) and Young and Middlemiss (2011). In what follows, I characterize the five frames of social studies of energy efficiency.

Economic sociology

Biggart and Lutzenhiser argue that energy inefficiency in the built environment is poorly understood by the current reliance on economically-based understandings such as demand-side management and supply-side market transformations. They also claim that the built environment is inadequately theorized and is understudied in the social sciences. So, where can economic sociology contribute to our understanding and intervening in social problems such as environmentally deleterious energy use? Economic sociology has fewer limitations than does neoclassical theory and can therefore explore energy use and exchange from a very different perspective. Economic sociologists can investigate actual economic behavior and analyze empirical settings to understand observable energy use and choice. In this way, economic sociology

can reveal the complexity of the social nature of "economic" behavior (Biggart and Lutzenhiser 2007).

Biggart and Lutzenhiser point to four areas in which sociology can make a difference by offering better assumptions and analyses about energy inefficiency: price rationality, organizational dynamics, markets and the social context of policy. While economics assumes that energy use is largely driven by prices, there are many instances in which price clearly does not shape behavior (or, if it does, it is not the only factor involved). Economic sociology can help us go beyond price rationality and explore the other factors involved, such as beliefs and status aspirations. Second, sociology can help us study how social relations and cultural variability affect actions related to energy consumption. Based on the simplified assumption of autonomous and rational individual behavior, economic theory cannot explain organizational dynamics. Third, an organization's choices are constrained and shaped by complicated organizational network relationships with different market actors. Economic sociology can help us understand how energy use is influenced by power, moral candidates and other factors that economic theory does not include. Moreover, economic sociology appreciates the interpenetration of different spheres of social life. Culture, beliefs, social structure, power relations and other non-economic considerations are often imbricated in energy decisions, and perspectives from sociology can explore how these complicated factors affect energy use.

Another study that leans on economic sociology in energy efficiency framing is Ek and Söderholms' analysis of Swedish households' willingness to increase their daily efforts to save electricity through new behavioral patterns (2010). Their empirical results, based on a postal survey, indicate that costs, environmental attitudes and social interactions are all important determinants of electricity saving activities. According to Ek and Söderholm, both economic and environmental motives play a role in households' decision-making processes, and the latter matter just as much as the former (or even more). This raises questions about the approach of many information campaigns conducted by, for instance, interest organizations, authorities and energy companies, which tend to

place a stronger emphasis on the economic benefits of saving measures (see also Gyberg and Palm, 2009).

Furthermore, based on postal survey responses from 655 Swedish households, Ek and Söderholm provide an econometric analysis of the most important determinants of Swedish households' decisions to pay a price premium for "green" electricity (2008). They show that the choice between "green" and "brown" electricity is determined by both economic factors as well as the presence of norms:

> The impact of choosing "green" on the household budget largely influences the willingness to contribute to "green" electricity schemes (a result well in line with most other studies), but so do also the degree of perceived personal responsibility for the issue and the felt ability to affect the outcome in a positive way. (Ek et al. 2008: 179)

Ek and Söderholm (2008) find evidence of a general lack of trust in the "green" electricity scheme. They also identify a view of the responsibility sharing that emphasizes the role of the government and the energy companies, rather than households. These factors probably explain the (so far) modest amount of "green" electricity purchases among Swedish households:

> Even though the possibility to purchase "green" electricity for a relatively small amount of money exists, many households are unwilling to "giveaway" money to something that does not achieve any good purpose and for which others have the main responsibility. (Ek et al. 2008: 179)

Winther and Ericson (2013) did a similar study of the responses of Norwegian households to the promotion of renewable electricity. They analyzed an experiment conducted by a power company that offered Guarantees of Origin of

supply to 5,000 of their customers, but gathered minimal responses. In line with the findings of Ek and Söderholm (2008), their analysis shows that customers tended to disregard information coming from their suppliers, and there was a low degree of commensurability between the message presented in the information and customers' understanding and perception of that message. (Similarly, Norwegians perceive electricity to be renewable in its current form.) Additionally, consumers found the presented terms and figures to be incomprehensible, to the extent that the information could have been said to have produced ignorance in them. As we will see further in this literature review, other perspectives or frames of energy efficiency also stress the barrier of using information as a tool for changing people's consumption patterns in deregulated energy markets.

According to Ek and Söderholm (2010), the more detailed the information about available options (for instance, feedback from electricity suppliers), the more effective it is in inducing behavioral changes. They also suggest that public measures that raise problem awareness of any negative environmental effects of electric power generation can induce more intense electricity saving behavior among households – at least if household members perceive that their activities matter for environmental outcomes.

> Finally, stimulating both public and private deliberations about everyday habits as a way of encouraging knowledge spillovers from one household to another could also form part of an effective policy package to stimulate additional reductions in households´ electricity use. (Ek et al. 2010: 1,585)

Furthermore, the frame of economic sociology shows that predictable patterns of interactions among household members influence energy saving efforts (Ek and Söderholm 2008, 2010; Thøgersen et al. 2010). Thus, Thøgersen et al. (2010) suggest two approaches to promoting electricity savings in households: (1) changing the socio-structural environment to be more facilitating to energy

saving and empowering householders to be more effective in striving towards this goal through improved feedback about their household's electricity consumption (i.e. improved communication services from electricity suppliers) and (2) social norms marketing that communicates social expectations and others' successful electricity saving achievements.

As we can see, the frame of economic sociology emphasizes that households' energy consumption depends on both motivational and structural factors, or barriers and drivers for change (Biggart and Lutzenhiser 2007). Within this frame, economic motives are considered important determinants of energy efficiency, but environmental motives also play a crucial role. Ek and Söderholm (2008, 2010) stress the presence of norms and self-expectations: shared responsibility and lack of trust in the surrounding context (of policymakers, energy companies and so forth) has a great impact on households' energy use. Consequently, in order to make informative policy instruments more effective, politicians and practitioners need an improved understanding of how policies interplay with attitudes, household values and constraints of time, money and knowledge that people face in daily life (Ek and Söderholm 2010).

Community focus

Four main instruments change behavior in relation to environmental problems: regulation and incentives; education and awareness raising initiatives; community management of environmental resources; and reference to moral, religious or ethical principles (Gardner and Stern 1996). According to Heiskanen et al. (2010), the first two instruments are used almost exclusively in European societies for energy efficiency purposes, but have met with little success. One of the main problems of these instruments is their focus on the individual, rather than the community. Their frame of collective action/community focus suggests that energy users should be engaged in the role of citizens – for instance through sustainable energy communities – and not only that of consumers. In this way,

people could gain the capacity to work together to transform their energy infrastructure on the local level.

Heiskanen et al. (2010) present low-carbon communities as a potential solution for four persistent problems in energy demand-side management: social dilemmas, social conventions, shared infrastructures and the helplessness of individuals when faced with the enormity of climate change. Social dilemmas arise when we try to solve collective problems like climate change by focusing solely on challenging individual behavior: "Unless people can assure themselves that others are contributing, their efforts to reduce the carbon footprint of their personal behavior may appear pointless" (Heiskanen et al. 2010: 7,587). By ensuring that everybody is participating and that people see that others are also taking responsibility, community management could be a solution for the social dilemmas of sustainable consumption.

Another obstacle consumers face when seeking to convert to low-carbon lifestyles is social convention. Shove (2003) shows how conventions of comfort, cleanliness and convenience are learned and maintained through social interaction. Conventions are socially shared and create common understandings of decency and appropriate behavior. It is therefore difficult for individuals to step outside conventional systems of consumption – the individual choice has a very limited role (Wilwhite et al. 2000). One solution that Heiskanen et al. (2010) suggest to this problem is support of new social groups to collectively develop alternative conventions (since this is too hard for an individual to do, alone). Moreover, they call for deliberative and inclusive processes that question existing conventions by problematizing current lifestyles.

Lack of infrastructure is another problem in energy demand-side management. The evolution of consumption patterns, conventions and customs is closely linked to the development of technologies of everyday life. Shove (2003) and others have shown how socio-technical systems shape the carbon intensity of our lifestyles: the unavailability of alternative systems creates barriers to change, and when alternative technologies become available they are difficult to adopt

because of the lack of supporting services, competencies and social structures. According to Guy and Shove (2000), high-carbon technologies are linked to broader systems of supported knowledge structures, supply chains, commercial interests and conventions – systems that we can call "regimes." Shifting to low-carbon lifestyles therefore requires a questioning and search for alternatives to existing infrastructures of energy consumption (and that is not an easy job for one person to do alone): "For lasting change, individual learning needs to be supported by new routines, infrastructures, institutions and networks" (Heiskanen et al. 2010: 7,588).

The final barrier to behavioral change that Heiskanen et al. (2010) identify is helplessness. The lack of infrastructure that makes it difficult for individuals to change their energy lifestyles shows how people are often locked into existing consumption patterns. When individuals are faced with the societal expectations of "taking responsibility," they may feel frustrated and helpless. "The small things that are easy for individuals to do may be relatively useless in the face of the enormity of climate change" (Heiskanen et al. 2010: 7,588). Helplessness and disempowerment can be countered by the provision of feedback to individuals on the collective impact they make in reducing carbon emissions. People need to feel that their efforts are making a difference. "From the individuals' perspective, collaboration in a community may counter helplessness and help to empower individuals by providing a feeling of competence, feedback on the impacts of their and others' actions, and a voice in devising solutions" (Heiskanen et al. 2010: 7,588).

Another contribution to the community-focused framing of energy efficiency examines the nature of environmental action in and around the home (Barr and Gilg 2006). According to Barr and Gilg (2006), individuals have come to symbolize the move from global, collective action to local, personalized responses to environmental issues. Barr and Gilg argue that this shift has individualized and privatized environmental action, such that environmental action has been integrated into everyday life. They discuss environmental behavior in relation to two key issues: (1) the way in which environmental action

is framed in everyday practices (consumption behavior, habitual activities and recycling behavior) and (2) how these practices are reflected among different segments of the population to form lifestyle groups. Barr and Gilg (2006) suggest that policymakers should focus on lifestyle groups as a means for changing behavior. This political advice has many similarities to the strategy of engaging energy users in their role as citizens (and not only that of consumers) in sustainable energy communities (Heiskanen et al. 2010). How can people gain the capacity to work together to transform their energy infrastructure on the local level?

Aall et al. (2007) examine the policy options available for local governments when addressing climate change mitigation. Their main conclusion is that the local administration ought to play an important role in climate policy. The climate change problem is both global and local, and the local administrative level has relatively strong powers of influence that are only expected to increase. According to Aall et al. (2007), it is important to involve the local level of government in order to legitimize and improve the efficiency of national climate policy initiatives. They claim that local authorities can play a central role in translating the climate change problem and making it comprehensible and relevant for local action: "The foremost challenge in climate policies will thus be to clarify how the global and the local levels are interconnected, in both nature and society" (Aall et al. 2007: 98).

As pointed out earlier, within this frame, increased community focus is presented as a potential solution to four complex barriers or overflows of energy efficiency: social dilemmas, social conventions, shared infrastructures and individual helplessness. According to Heiskanen et al. (2010), climate change is a collective problem that cannot be solved by focusing solely on individual behavior. Rather, in order to overcome complex overflows, we should support new social groups that collectively develop low-carbon communities with alternative conventions, practices and infrastructures. By providing individuals with feedback on their collective impact, their sense of futility might disappear (Heiskanen et al. 2010). Furthermore, Barr and Gilg (2006) emphasize the

importance of everyday practices and segments of lifestyle groups that represent different framings of environmental action. The translation of energy efficiency to make it relevant and available for different lifestyle groups is thus an important task for local authorities and communities.

Technology, innovation and (lack of) communication

When framing energy efficiency with a focus on technology, innovation and communication, Heiskanen and Lovio (2010) ask a highly relevant question: Why is there no (more) progress in energy efficiency, even though the technology is within reach? Although low energy prices have offered little encouragement in searches for the most energy efficient solutions – and the political will to regulate the energy efficiency of the built environment has been lacking – the authors argue that the core of this problem is a communication gap. If prices and legislation were to more forcefully steer the parties involved toward greater energy efficiency, we would still suffer from a communication breakdown. What is this problem really about?

According to Heiskanen and Lovio (2010), the exchange of energy efficiency knowledge among experts and laypeople reflects a fundamental problem in product innovation. This communication challenge can be termed as a problem of "sticky information" (Von Hippel 1994, 1998): "Information about users' needs and manufacturers' capabilities is highly contextual, tacit, and difficult to transfer from one site to another" (Heiskanen and Lovio 2010: 93). Users and producers frame energy use in different terms, and thus experts fail to understand why households behave "irrationally" because they fail to grasp consumers' logic of energy use. The problem of sticky information is further complicated in the case of societal innovations such as energy efficiency, since societal actors (such as public energy agencies) have their own perspective on the innovation and must try to communicate with both producers and users as market actors.

One problem with "sticky information" is that designers and societal actors produce user representations that often do not correspond with the way consumers actually act (Akrich 1995). As a solution to this, Heiskanen and Lovio (2010) suggest three forms of intensified interaction between the world of designers and the world of users: designer participation in the user context, user participation in design and user innovation. On the basis of findings from a case study on the introduction of low-energy housing concepts in Finland, they argue that the communication gap between producers and users can be filled by the introduction of new communication skills and methods. Energy efficiency research and policies should also pay more attention to issues of power, interests and trust, which highly influence user involvement.

Despite the focus on citizens as energy end-users and the intentions of more active energy users, it has remained less clear what citizens can and are willing to do. Another study that has framed energy efficiency in terms of technology, innovation and communication has tried to clarify how Finnish citizens are able to invent home heating systems (Hyysalo et al. 2013). This study demonstrates that, during the years 2005–2012 there were 192 inventions or modifications that improved either the efficiency, suitability, usability, maintenance or price of heat pumps or pellet systems by users in Finland, alone. These citizen user inventions point at what is missing in the market: people who are aware of the limitations of the technology and try to solve these limitations with inventions. Furthermore, the inventions complement and offer alternative routes to the proliferation and design of the technologies in question.

According to Hyysalo et al. (2013), inventive users can speed up the development and proliferation of distributed renewable energy technologies – both through their alternative designs and through the advanced peer support they provide in popular user-run Internet forums related to the purchase, use and maintenance of these technologies. Hence, policymakers, manufacturers and standards-setters should examine the inventions from the perspective of what needs to be done, especially when bringing products to new local markets. Moreover, policy actors should equally provide support for attempts to set up

new forums that bridge different renewable technologies. Hyysalo et al. (2013) claim that both corporate and policy actors could benefit from identifying and inviting the "lead-users" into ideation workshops to chart future development: "Another implication for energy and climate policy is the possibility to invite inventive users into the ideation of innovation support mechanisms and in identifying barriers to proliferation of local renewable energy and electricity generation" (p. 499).

Still, as is true for most technologies, the proportion of users who have the will and capacity to create inventions and inventive modifications is relatively small – less than 0.5% (Hyysalo et al. 2013). So, what about the other 99.5% of energy users? When studying the process of building new single-family houses and examining how energy efficiency and energy efficient technology are incorporated into the building process, Palm (2013) found that actors did not see energy efficiency as a critical problem. According to Palm, it is a big challenge to make low-energy building important to consumers: "Consumer preferences for new products are unlikely to fully develop unless individuals have the opportunity to interact with them" (Palm 2013: 762). She claims that it is difficult for consumers to know what to ask for if they lack experience with energy-efficient technologies. In this way, building codes and established standards become extremely decisive for the ways in which energy issues are included in the process. In addition, to take building codes and standards more seriously, policymakers must change the design of incentives to make the least energy-efficient choice the most expensive. Palm (2013) argues that the most energy-efficient solution should be standard, and, if a buyer wants to depart from that standard and build with less energy-efficient construction, this should cost more.

To summarize, the frame of technology, innovation and (lack of) communication points to the problem of "sticky information" (Von Hippel 1994, 1998) that occurs in the exchange of energy efficiency knowledge. Since users and producers frame energy consumption in different terms, there is a communication gap that creates externalities of energy efficiency (Callon 1998).

This frame focuses on the technology and innovation processes, and holds that we can create better progress in energy efficiency with more intensified interaction between the world of designers and the world of users (Heiskanen and Lovio 2010). User representations are important within this perspective, as is the involvement of inventive users who Hyysalo et al. (2013) claim can speed up the development of energy technologies. Still, most energy users are not inventive, and are not even interested in energy innovations. Palm (2013) shows that the enrollment of consumers in new energy efficient technologies is a major challenge; for instance, in building processes, users must be able to interact with energy efficient technologies and innovations in order to achieve energy efficiency.

Barriers

Thollander et al. (2010) identify 15 barriers to energy efficiency. These theoretical barriers are divided into three categories, according to each barrier's system complexity. In the first category – the technical system – results are restricted to technology and its associated costs. In the second category – the technological regime – results are influenced by human factors but nevertheless coupled with the technology in question. In the third category – the socio-technical regime – results are heavily influenced by human factors and less influenced by the technology in question. According to Thollander et al. (2010), re-defining how we should categorize barriers can open up new ways of looking at the problem, which, in turn, might lead to other suggestions for addressing the energy efficiency gap. In other words, how we perceive and define these barriers leads to different solutions for overcoming the barriers and, ultimately, to different policy recommendations.

On the basis of focus group interviews, Throne-Holst et al. (2008) identify six barriers for changing energy consumer behavior: physical and structural barriers, political barriers, cultural-normative barriers, economic barriers, information barriers and individual-psychological barriers. Of these six barriers,

they find three most relevant, with the highest explanatory value: cultural barriers (i.e. visions of a good life: big and flexible homes, a degree of freedom, etc.), economic barriers (i.e. economic barriers to invest in new energy technologies, payback time, increased wealth, etc.) and information barriers (i.e. questions such as: What should we do? How do we save energy?). The researchers consider situations of opportunities for households and find that people who move or plan to move are more open to question their own use of energy than are households without such plans. They claim that there is a weak link between attitudes and behavior: "the environmentally conscious participants tended to focus more on the health aspects of housing, than on the potentially positive effect of energy efficiency on the environment" (Throne-Holst et al. 2008: 64).

The missing link between attitudes and behavior is supported by Vringer et al. (2007). Using a consumer survey of 2,304 respondent households, they investigated whether there was a relationship between the total household energy requirement, on the one hand, and value patterns, a motivation to save energy or a problem perception of climate change, on the other hand. The study shows no significant relation between the total household energy requirement and value patterns of consumers, their problem perception of climate change or their motivation to save energy, after taking into account the differences in households' socio-economic situations. Accordingly, Vringer et al. (2007) argue that a self-regulating energy policy, based solely on a strategy of internalizing environmental responsibility, would not be effective in saving energy.

Moreover, Abrahamse et al. (2005) evaluated the effectiveness of interventions aiming to encourage households to reduce energy consumption; most of these interventions focused on voluntary behavior change through attempts to change individual knowledge and/or perceptions, rather than contextual factors that could have determined households' behavioral decisions. In line with Vringer et al. (2007), Abrahamse et al. (2005) found that information tended to result in higher knowledge levels, but not necessarily in behavioral change or energy savings. Rewards effectively encouraged energy conservation, but with rather

short-lived effects. Feedback also proved its merits, particularly when given frequently. To improve intervention planning and to enhance the effectiveness of interventions, Abrahamse et al. (2005) suggest that multidisciplinary research teams should focus on both the micro- and macro-level factors contributing to household energy use.

An important message from the frame of barriers is that energy efficiency policy must find strategies to overcome the different barriers of technology, culture, information and economy that households struggle with in everyday life. How can energy efficiency be made relevant and available to people? Slocum (2004) examined the strategies of organizations that work with global climate change or climate politics. These organizations represent climate change in ways that they hope will make the problem relevant to people and thereby inspire political action. Their strategies require a choice of objects for bringing climate change home to constituents. Slocum investigated the strategies of two organizations that tried to localize or make climate change relevant through different objects (polar bears and energy efficient light bulbs), and argues that organizations localizing climate change should choose objects that are more accountable to their constitutive effects on societies.

In addition to the barriers that Thollander et al. (2010) and Throne-Holst et al. (2008) highlight, Carlsson-Kanyama and Lindén (2007) argue that there is a need for a gender perspective on residential energy use. Drawing on interviews with 30 Swedish households who participated in energy efficiency campaigns, they explore how the sexes divide the new household chores and analyze their opinions regarding these chores. Their study focuses on the ways in which households respond to policy instruments and the degree to which these potential changes in behavior may affect the workload of men and women. One of the main findings is that information, alone, is not enough to promote change; user-friendly equipment and/or economic incentives such as individual energy bills are also needed to support a change in behavior. The other important message from this study is that the extra workload induced by energy savings may, at times, be significant and fall upon women in a disproportionate way:

"Designing policy instruments in ways that do not increase this stress further is an important undertaking for the future in settings similar to the Swedish case" (Carlsson-Kanyama and Lindén 2007: 2,171).

On the whole, the frame of barriers focuses on different ways of identifying externalities in relation to energy efficiency. From this perspective, re-defining categories of barriers will lead to different perceptions and suggestions for addressing the energy efficiency gap. Thollander et al. (2010) divide the barriers into three categories – the technical system, the technological regime and the socio-technical regime – while Throne-Holst et al. (2008) find cultural barriers, economic barriers and information to be the most relevant. The frame of barriers emphasizes the missing link between attitudes, information and behavior (Throne-Holst et al. 2008; Vringer et al. 2007; Abrahamse et al. 2005; Carlsson-Kanyama and Lindén 2007). According to Vringer et al. (2007) there is no significant relation between the energy consumption of households and consumers' value patterns, perceptions of climate change or motivations to save energy. In this way, energy efficiency policy based on strategies of information, alone, or internalizing environmental responsibility, would not be effective.

Energy culture

According to Owens and Driffill (2008), it is important to study the social, cultural and institutional contexts in which energy attitudes and behaviors are formed. They show how the "information deficit" models have failed in this manner, and criticize the use of "NIMBYism" (Not In My Back Yard) as a limited theoretical approach for explaining these complicated factors. They believe there is a need for a richer understanding of opposition to energy facility siting. Furthermore, they call for more deliberation and better communication between decision-makers, technical experts, other stakeholders and the public.

Consequently, Owens and Driffill (2008) argue that the social sciences can help us understand issues related to attitudes and behavior in the context of energy in

a better way than can traditional economic, rationalist information deficit models. For instance, the fact that individuals' pro-environmental attitudes are often not reflected in significant shifts in behavior, or that these attitudes are apparently inconsistent, should not come as a surprise (although it is often offered as a paradox). Insights from social psychology demonstrate the complexity of attitudes and behaviors, and the relationship between the two. Behavior is influenced in complex ways by factors such as price, awareness, commitment and trust, as well as a sense of moral obligation. Also, recent work from the social sciences has drawn attention to the important influence of routine habits, cultural norms, practices, social networks, fashion and the dynamic interplay of human agents and technologies in socio-technical systems that structure patterns of energy consumption in everyday life. Energy use is, in many ways, framed by dominant conceptions of comfort, cleanliness and convenience, which become embedded in the built environment (Shove 2003).

When it comes to dealing with energy demand and energy efficiency, people may frame the problem in different ways – for example in terms of the morality of human interference with the planet, rather than as a scientific issue (see Thompson and Rayner 1998). Insights from the social sciences also show us that individuals may perceive that they have "neither the prime responsibility to take action, nor the agency to have much effect" (Owens 2000). In this way, behavior may be restricted by a sense of the futility of individual action. A study by Levin (1993) on the reaction to increasing levels of information about environmental problems concluded that more information led to greater concern, but paradoxically also to greater helplessness. Research also suggests that people see governments as responsible for addressing environmental problems, yet they have little faith that they will. This problem might be a consequence of the mixed messages that people receive from the government (Owens and Driffill 2008).

To improve understanding of the factors that influence energy consumption behavior and to help identify opportunities for behavior change, Stephenson et al. (2010) offer the "Energy Cultures" framework. The Energy Cultures framework suggests that consumer energy behavior can be understood at its

most fundamental level through examination of the interactions between cognitive norms (e.g. beliefs and understandings), material culture (e.g. technologies and buildings) and energy practices (e.g. activities and processes). These three core concepts are highly interactive, and are also linked to an outer ring of wider systematic influences of behavior that is referred to as the "contextual soup." The framework is change-oriented, rather than deterministic: "wider social, environmental and economic forces *structure* but do not *determine* people's cognitive norms, practices and material cultures" (Stephenson et al. 2010: 6,127). This interdisciplinary framework is designed to identify clusters of energy cultures – similar patterns of norms, practices and/or material culture – as a tool for understanding the potentials and possibilities for sites of action to achieve behavioral change.

Inspired by this Energy Cultures framework, Young and Middlemiss (2011) claim that any organization of influence – be it a central government, local authority, public institution, company, community group or charity – should use a package of policies that impacts on the individual level, community level and the wider context. In order to demonstrate practical approaches that might give initiatives real impact, they have developed a "wheel of change" framework. This framework is based on theories of: (1) empowering individuals to change their actions, (2) empowering communities to change individuals' actions and (3) changing the context to change individuals' actions. To help change the actions of individuals, low-carbon initiatives must enable individuals to take actions, themselves. They must also enable the community to change individuals through a mixture of social pressure and support (see Heiskanen et al. 2010) and to change individuals' context to reinforce and dictate action change.

Another contribution within the frame of energy culture is Aune's Norwegian case study, in which she discusses private energy consumption and possibilities for change in energy behaviors and technologies (Aune 1998, 2007). Aune argues against a rational economic view of the consumer and shows that many factors shape the consumption pattern: "According to social and cultural approaches, private energy consumption is a result of a combination of activities,

preferences, values, technologies and material structures" (Aune 2007: 5,463). In her analysis, Aune develops four distinct energy cultures as a result of these various combinations: "The environmentalists," "the indulged," "the hesitating environmentalists" and "the sober indulged" (Aune 1998). She also uses the home as an entry point into this network and constructs three categories of homes (Aune 2007). These categories illustrate the various ways in which houses can be domesticated and turned into homes by constructing and negotiating networks of occupants, activities, values and technologies: "the home as haven," "the home as project" and "the home as arena for activities."

Similar to the findings of Palm (2013), Aune (2007) demonstrates that the issue of energy is only one of many factors involved in building a house or making a home. Design, functionality, images, activities and artifacts are, among others, important parts of the domestication of a home, and also important in respect to energy use. Accordingly, the three categories of the home represent energy users that behave in very different ways when it comes to energy efficiency and energy consumption. For this reason, Aune (2007) suggests that energy policy directed towards the "home market" should meet the requirements of different images and practical constructions of the home, and not expect a simple diffusion process of either information or energy efficient technologies. The analysis indicates that it is important to integrate economic instruments with policies and technologies that appeal to different types of homes.

Likewise, Gram-Hanssen (2010) demonstrates how a user-centered approach to heat consumption in housing can reveal highly relevant aspects of residential energy use. Through a detailed analysis of empirical evidence from different households living in similar houses in a suburb of Copenhagen, she shows that significant variation in energy consumption is due to people's different usage patterns of both their house and its heating system. Gram-Hanssen proposes a framework for understanding why people act as they do through a practice-theory approach, which finds that "technologies, embodied habits, knowledge and meanings are the main components in the understanding of both what holds this practice together as a collectively shared practice and the different socio-

material configurations of each of the individual households" (Gram-Hanssen 2010: 175).

In line with Aune (1998, 2007), Gram-Hanssen (2010) argues that studies of energy use related to comfort must include an understanding of different social, cultural and material structures. She focuses on practices that are strongly shaped by technology and discusses four elements that hold these practices together: (1) practical understanding, embodied habits and know-how, (2) rules, knowledge and language, (3) engagements and meanings, and (4) products, things and technologies. According to Gram-Hanssen, the most important lesson for energy policy and other practical applications should be the insight gained from the four elements holding these practices together: "Each of the four elements should be seen as a structure sustaining practices, at the same time as these elements are sustained and developed by the practitioners performing the practices" (Gram-Hanssen 2010: 185).

As we can see, the frame of energy culture departs from a rationalist economic view of the consumer and shows that many factors shape energy consumption patterns (values, activities, technologies, habits, etc.). Accordingly, this perspective addresses further collaboration, transparency and acknowledgment of limitations for social scientists working in this area (Owens and Driffill 2008; Stephenson et al. 2010; Young and Middlemiss 2011). The frame of energy culture suggests that policies to change individuals' actions on GHG emissions should use a package of measures based on a multidisciplinary view of research evidence and theories, rather than favoured, individual social science theories. It also has some similarities to the frame of community focus; for instance, the frame of energy culture shares the call for empowering communities to change individuals' actions, but the frame of energy culture also stresses the impact of the individual level and the wider systematic context of energy efficiency ("the contextual soup"). From this perspective, the variation in individual behavior and energy practices in people's everyday life is crucial for understanding energy use.

The five frames and beyond: A pessimistic outlook

In this literature review, I have used the concept of "framing" (Goffmann 1971; Callon 1998) as a scientific tool to analyze and categorize a range of socio-cultural approaches. The focus on framing offers an effective entry point for identifying and exploring the social scientific approaches to energy efficiency and their differences. While this thesis draws on understandings inspired by all of these five frames, it primarily draws on insights from the frame of energy culture. Accordingly, in my analysis of Norwegian households' energy consumption, I study the interactions between cognitive norms, material culture and energy practices in relation to "the contextual soup" (Stephenson et al. 2010). What other insights from these five frames should we bring into our analysis of household energy consumption?

In contrast to economics and environmental psychology, the social sciences provide insights that show that energy demand not only originates in the individual, but is also a social construct wherein institutional and cultural contexts influence energy behaviors and attitudes (Owens and Driffill 2008). What these contributions have in common is that they criticize the economic approach for externalizing the socio-cultural dimensions of energy use, and leave consumer behavior and other important contextual factors outside their framing of energy efficiency. In this way, the five frames of socio-cultural research on energy efficiency and energy use offer a set of understandings of attitudes and behavior in an energy context that strongly differs from the economic (and psychological) frame.

However, there is no unified approach to social studies of energy efficiency. For instance, the relationship between attitudes and actions is framed in very different ways. Economic sociology emphasizes the impact of internalized norms and self-expectations; from this perspective, environmental motives play an important part in decision-making. In contrast, research within the frame of barriers claims that there is a missing link between attitudes and behavior. Moreover, issues of responsibility and empowerment concerning individuals,

society and energy efficiency are framed differently. From the perspective of community focus, climate change and energy efficiency are collective problems that cannot be solved by a focus on individual behavior (Heiskanen et al. 2010). The frame of energy culture, on the other hand, does not deny the impact of the local level, but also suggests strategies that concentrate on the individual level and the wider context.

Obviously, the social sciences represent different and, to a certain degree, conflicting approaches to energy efficiency and energy use. Still, the five frames of energy efficiency have some common calls. First, they criticize economics and environmental psychology for neglecting societal factors by focusing solely on the (economic rational) individual when framing energy efficiency. Second, the five frames contribute to more comprehensive understandings of attitudes and behaviors, new disciplinary insights and more sophisticated concepts of the interdisciplinary. Furthermore, they deal better with complexity in policymaking by re-conceiving the role of the public and consumers (public engagement), challenging the deliberative turn, using fewer mixed messages and offering a more systematic approach to help clarify the implications for energy efficiency policy (Owens and Driffill 2008). The five frames seem to agree that energy efficiency studies require an increased integration of disciplines in order to deal with the complexity of energy behaviors.

What also characterizes the five frames is that many of these approaches have a rather pessimistic outlook on household energy consumption in the sense that they focus on fairly singularly policies that do not work and challenges in making consumers change their everyday lives. The frames point to several problem areas concerning the status quo of energy consumption, which appear to be difficult to solve: (1) lack of trust and externalized responsibility to the surrounding context (of policymakers, energy companies, etc.) hamper the reduction of households' energy consumption, (2) household consumers do not act according to their expressed attitudes, (3) changes in energy behavior cannot be made on an individual level because of various social dilemmas (there must be a community focus), (4) comfort and convenience are more important to

household consumers than are environmental considerations, (5) a communication gap between users and producers of energy consumption causes externalities of energy efficiency, and (6) energy consumption is determined by old habits and practices that are hard to change.

However, the findings of Hille et al. (2011) give us reason to believe that some changes in household energy consumption and energy efficiency are actually happening. Despite the various barriers that the five frames emphasize, Norwegian household energy consumption has levelled out since 1990 (Hille et al. 2011). In this thesis, papers 3 and 4 point to possible changes in household energy consumption. Paper 3 shows that the symbolic domestication of household energy consumption changed due to climate concerns; to a more modest degree also the practical domestication. Apparently, the increased focus on global warming produced a feeling of guilt among household consumers in relation to energy use, making them consider their energy consumption in a more concerned way than they had in the past. Although the political technologies for energy efficiency efforts had not worked in the way they were supposed to, people tended to view energy consumption as more problematic than they had previously.

Furthermore, paper 4 demonstrates how household consumers made sense of energy consumption and energy efficiency through the concept of ethos, which consisted of four partly conflicting moralities concerning (1) saving, (2) needs, (3) merit and (4) entitlement, with respect to energy use. As a result of this symbolic domestication, household consumers called for a different program of household energy consumption that incorporated their ethos of energy efficiency. In other words, they asked for energy efficiency instruments that actually corresponded with their values, needs and beliefs.

Although the practical domestication of energy consumption seemed rather unchanged, in that everyday life practices were similar to their previous forms (cf. comparison of energy cultures in paper 3), this thesis shows that there was an ongoing shift in mentality among consumers. This observed change in the

symbolic domestication of energy issues might have a positive effect on future household energy consumption and energy efficiency. How can we understand these dynamics of household energy consumption?

Household energy consumption can be understood as a hybrid of social and technological elements that interplay with different dynamics of the household (Aune 1998). Energy consumption is thus a consequence of both human behavior and technologies; energy consumption is electricity, a long shower, house insulation, a warm cup of coffee, dried clothes and so forth. In other words, it is a socio-technical construction. Accordingly, when studying household energy consumption and energy efficiency, I lean on science and technology studies (STS), which combine material/technological and social/cultural elements in a seamless web (Hughes 1988). From this perspective, technological and social elements are not separated in descriptions of socio-technical phenomenon such as energy consumption.

In order to unpack and understand the dynamic processes shaping energy policy and energy consumption, I turn more specifically to actor-network theory and user studies. These STS approaches can help us analyze how policymakers frame household energy consumption and how household consumers domesticate energy consumption and energy efficiency into different patterns of norms, understandings and practices in their everyday lives. Compared to the majority of other social studies of energy consumption (cf. the five frames of social studies on energy consumption), this thesis offers a more comprehensive approach to energy consumption by combining the perspectives of policymakers, economists and household consumers. It explores the dynamics between these actor groups in addition to the domestication processes that take place within the households when dealing with energy efficiency issues.

Theoretical concerns and analytic concepts

Science and technology studies (STS) show how technology and science are socially and culturally shaped, as well as how technology and science influence

society and culture (Bijker et al. 1987). From an STS perspective, culture and practices should not be considered separate from technology. In the same way, we cannot look at technology as independent from the cultural or social conditions of technology. Rather, the STS perspective points out that technological, scientific, economic and political factors are connected in a seamless web (Bijker et al. 1987; Callon 1987). The metaphor of the seamless web can also illustrate the connection between attitudes, behaviors and technology on a micro-level, which means that we should study technology and society through dynamic interaction. For this thesis, it implies studying the creation of socio-technical constructions related to household energy consumption.

Co-production: How do things change in relation to each other?

Jasanoff (2004) tries to answer the question of dynamic interaction, or how things change in relation to each other, by introducing the idiom of co-production. The concept of co-production represents an integrated approach to studying technology and society. Jasanoff claims that, today, science and technology are interwoven with issues of meaning, values and power in ways that demand sustained critical enquiry. Increasingly, the realities of human experience emerge as the joint achievements of scientific, technical and social enterprise: science and society are *co-produced*, with each underwriting the other's existence (Jasanoff 2004). This complicated exchange of actors in various spheres of society (including policymakers, experts, household consumers, etc.) requires a nuanced analysis, which can offer a way of understanding the constant framing or construction of household energy consumption. How should we study these dynamic and complex processes of interaction?

Jasanoff criticizes the linear model for being an unconstructive tool for analyzing society and technology; this is because the traditional model, focusing on cause and effect in a linear way, does not grasp the complexity and fluidity of these processes. According to Jasanoff, science, technology and social systems mutually

contribute to each other's construction. In this way, there is a co-production of the social, the scientific, the cultural and the technological (2004). Jasanoff's post-modern contemplation can be understood as a criticism of the realistic ideology that divides nature, sense, facts and objectivity from culture, values, sensibility and subjectivity. Technological and scientific phenomena (for instance energy efficiency) are brought together by nature, culture, facts and values. Thus, co-production relates to different fields and explores the dynamic interaction between them.

By uncovering the connections between science and practice, knowledge and values, co-production can also offer us new ways of studying energy behavior and energy consumption: "in broad areas of both present and past human activity, we gain explanatory power by thinking of natural and social orders as being produced together" (Jasanoff 2004: 2). The idiom of co-production emphasizes the constant interplay between the cognitive, the material, the social and the normative. According to Jasanoff (2004), this co-production of nature and culture, technology and society, happens along four pathways that occur in various combinations and with different strengths, according to the context: making identities, making institutions, making discourses and making representations (Jasanoff 2004; Karlstrøm 2012).

These four pathways can be seen as the consequences, or results, of co-production, but also as points of departure for studying co-production. They all play their part in the maintenance and stabilization of knowledge, technology, practice and politics. Accordingly, the pathways can serve as effective tools for analyzing the co-production of knowledge, values and practice in household energy consumption and energy efficiency. In this thesis, I study various forms of co-production. Paper 1 investigates the co-production of economic knowledge and energy policy when policymakers engage with energy efficiency issues: How is household energy policy assembled by values, economic theory, political intentions and beliefs? The second article deals with the relationship between energy policy and energy practices. It demonstrates how economists and household energy consumers frame energy consumption and the electricity

market in very different ways. In this case, there is a lack of co-production between the two worlds of policymakers and users. Papers 3 and 4, on the other hand, explore the co-production of energy consumption and energy efficiency understandings that happen within the households.

In order to study the co-production of energy technologies, practices, values, knowledge and beliefs in household consumers' dealings with energy consumption and energy efficiency, I turn to domestication theory. This approach offers a way of understanding the processes by which knowledge and practices are re-shaped, transformed and eventually used in people's everyday lives. How do people make sense of energy consumption? How are energy practices and attitudes co-produced? Second, I use theories of framing to analyze the construction of household energy consumers. Finally, in order to analyze the lack of co-production between energy policies and energy practices, I turn to actor-network theory, which offers an analytic tool through the concept of program/anti-program. How can we characterize the program of the policymakers and the anti-program of the consumers? First, let us dive into domestication theory.

Domestication theory

One of the issues this thesis deals with is how people make sense of energy efficiency as it is presented to them as public policy. To respond to this question, we must consider the hybrid nature of energy efficiency policies. In Norway, as we saw in the previous section, the policy of ENØK is based on economic, as well as technological, elements. Thus, making sense of energy efficiency means, on the one hand, understanding and engaging with knowledge about economic aspects – in particular the liberalized market for electricity. On the other hand, people must also make sense of energy efficiency technologies and methods of developing new practices. I shall explore these issues by drawing upon domestication theory.

Traditionally, studies of the way people relate to science and technology have been methodologically based on surveys focusing on fact-oriented knowledge. A common finding in this literature is that the public lack important information about science and technology (Wynne 1995). These studies have also tended to work from a lay–expert binary, wherein experts have supplied the knowledge that the public has been expected to appropriate (Ryghaug, Sørensen and Næss 2010). Irwin and Michael (2003) critically label this method "a deficit model"; according to their approach, the public's lack of knowledge should be rectified through more and better communication of science and technology. They also claim that the patterns of public understanding are much more complex than what this deficit model can capture, and that the lay–expert (and related science–society) binary should be challenged, since the distinction between experts and the public (and between science and society) is blurred (Irwin and Michael 2003; Ryghaug et al. 2010).

According to Sørensen, Aune and Hatling (2000), a user-centered focus can help us understand the processes by which knowledge is re-shaped, transformed and eventually put to use in people's everyday lives. They claim that the tension between people's efforts to act in and make sense of their everyday world and the authority and insights found in scientific and technological knowledge call for appreciation and understanding (Sørensen et al. 2000). How can we understand and appreciate the public's efforts to gain and domesticate knowledge? Sørensen et al. (2000) suggest that we find a way to study appropriation and agency. One such approach to this is domestication theory – we must investigate how people translate information about energy consumption and energy efficiency and integrate this into their everyday lives.

To domesticate energy consumption and energy efficiency, people need to negotiate the meanings and practices of these matters in a dynamic, interactive manner that makes sense within their own cultural framework (Sørensen et al. 2000). How do people relate to energy consumption and energy efficiency, and how do they produce meaning in their actions as energy consumers? Domestication theory has been expanded to also serve as a tool for studying how

scientific knowledge is appropriated by the public (Sørensen 2006). As Martin (1994) shows, most people do not appropriate scientific concepts to emulate experts, but rather to make sense of their own lives and find solutions to relevant challenges in their own cultural framework. Instead of seeing the public as passive recipients who have been excluded from the production and validation of knowledge, we should therefore understand and include the public as participating societal actors who consider, validate, adapt and supplement the knowledge that is communicated to them (Martin 1994; Ryghaug et al. 2010). How does this user perspective affect the analysis of how people make sense of energy consumption and energy efficiency issues?

Domestication theory helps us understand how knowledge and information is selected, transformed and, eventually, put to use in people's everyday lives. This concept conveys the public's need to "tame" facts and artifacts that are taken from a "wild" outside world and to put them into a domestic setting (Sørensen et al. 2000). However, the taming of technologies or knowledge is not one-sided. As Lie and Sørensen put it: "This process of taming is characterized by reciprocal change" (1996: 8); in other words, both technology/knowledge/artifacts and users may change. "Domestication therefore has wider implication than a socialization of technology: it is a co-production of the social and the technical" (Sørensen 2006: 46). Moreover, this approach allows for clarification of the involved beliefs and values in this process. To analyze domestication of the hybrid of technologies and knowledge that constitutes household energy consumption and energy efficiency issues means to study the development of practices, the construction of meaning and the processes of learning with respect to the area or object of concern (Sørensen et al. 2000; Sørensen 2006).

Strategies of domestication – or, in this case, sense-making and appropriation of energy consumption and energy efficiency – thus take place in three main dimensions: the practical, the symbolic and the cognitive. First, people develop energy consumption and energy efficiency practices that they deem appropriate. How can they act upon the challenges they perceive? Second, regarding the symbolic dimension, they interpret energy and energy efficiency in ways that

allow them to make sense of the issues, to uphold their identity and to be helpful to the public self-presentation they wish for. What meanings do people produce when they are faced with energy consumption and energy efficiency issues, and how do they represent themselves and their opinions in public? Third, and finally, energy efficiency needs to be cognitively appropriated to allow people to make use of available technologies and behavioral options (Sørensen 2006).

According to Sørensen et al. (2000), what is constructed through domestication may be understood as micro-networks of humans, artifacts, knowledge and institutions. This thesis focuses on how individuals account for and appropriate energy consumption and energy efficiency, but this does not mean that individuals' decisions and their domestication of these matters are performed independently of others. Appropriation happens in complex intersections of meaning, learning and practice among actors in different areas of societal life (e.g. media, experts, transport systems, the economy, laypeople, housing, etc.). In these networks, different domestication processes constantly construct micro-networks such as heating systems, homes, ecological products, energy efficiency policies and car use. To be able to function within these micro-networks, people draw upon symbolic, cognitive and practical resources that, again, produce effects that result in observable energy lifestyles, patterns of energy consumption and various energy identities or energy cultures (Sørensen et al. 2000).

As already noted, domestication is a process whereby technological objects and the handling of scientifically described phenomena (like energy efficiency policy or the electricity market), and the people who appropriate this knowledge, may change (Aune 2007). In this way, domestication offers insights into dynamic interactions that take place with respect to human beliefs and actions, as well as technology and the material environment (Aune et al. 2011). Phrased differently, domestication processes may result in acceptance or rejection of energy efficiency policy or market mechanisms that come in different shapes of individual or collective knowledge transformation. What is certain is that energy efficiency policy and the electricity market must be recognized as real and

important in everyday life (symbolically), must be understood (cognitively) and must be acted upon (practically), to result in active energy consumer behavior. In this way, if domestication processes are prepared properly, the public can gain scientific knowledge about energy efficiency on their own (and energy policy might be more effective).

According to Sørensen, the main advantage of the domestication perspective is that:

> It is a conceptual device that sensitizes the analyst to the complexity of integrating artefacts into socio-technical settings, like the household, the workplace, or society. It is a reminder to be concerned with the practical, symbolic and cognitive aspects of the work needed to do this integrations, at multiple sites. (2006: 56)

In this way, the domestication perspective enables a socio-technical theoretical perspective that integrates well with actor-network theory. The domestication approach focuses on the user and serves as an effective tool in explorations of how people frame (Callon 1998) their own scripts (Akrich 1992) or anti-programs (Latour 1992) when dealing with energy efficiency issues in their context of use, or what we may label everyday practices. How are the practical, symbolic and cognitive aspects of energy use framed in their domestication of energy consumption and energy efficiency? Furthermore, this approach can help us understand how people not only shape, but are also shaped by, domestication processes. Likewise, energy efficiency issues both shape and are shaped by consumers (Sørensen 2006). How are people and their socio-technical relations co-produced?

The term "co-production," which I have already discussed, was originally introduced by Latour (1992). Latour claims that the modern distinction between nature and society is human-made and Western-oriented. As a reaction to this differentiation, he launches a new post-modern constitution: our world consists

of a large, joint collective that includes humans, non-humans/artifacts and nature (Latour 2004, 1987; Jasanoff 2004). According to Latour (2004), the associations between actors construct meanings, knowledge and practices. Therefore, the main challenge and commission of the scientific researcher's work is to uncover and analyze these connections in the collective of co-production. Actor-network theory (ANT) offers an interesting entry point to this study of actors, networks and connections.

Actor-network theory

Actor-network theory was developed in the 1980s by Michel Callon and Bruno Latour at the École des Mines in Paris, and later in dialogue with a larger group of researchers such as John Law, Susan Leigh Star, Arie Rip, Donna Haraway, Donald MacKenzie, Anne-Marie Mol and more (Sørensen 2004). Instead of focusing on traditional linear cause-effect explanations, ANT emphasizes how the techno-scientific society can be analyzed as a set of interconnected relations between humans and non-humans/artifacts. In this way, ANT shows how phenomena, knowledge, technology and practices are made, understood, changed and integrated in a wider cultural context. The actor-network cannot solely be reduced to a single actor or network, alone (Asdal et al. 2001; Callon 1987; Latour 1999; Sørensen 2004). "The point is to see society as a set of heterogeneous associations or networks of humans and non-humans" (Sørensen 2004: 8). Thus, from this perspective, it is important to examine the cultural context that energy consumption is part of.

In ANT, society is perceived as a network or a structure of both humans and non-humans (e.g. artifacts, technologies, etc.) that cannot be reduced to either nature or culture. Latour claims that humans and artifacts are in a productive relationship of exchange, and that this relationship constructs and constitutes social structures (Latour 1988, 1992; Sørensen 2004). In this context, the stabilizing elements are the artifacts or non-humans, as humans continue to delegate more tasks to the artifacts. This delegation is based on relatively clear

conceptions of what the artifacts/technologies ought to do and ought not to do. For example, the bus brings us from one place to another, the road regulates how we walk or drive and the parking lot takes care of our car.

To include and focus on technology and artifacts is thus important, because artifacts and technologies function as stabilizing elements: "Through our connections to the artefacts, we get tied up, normalized and defined. This way, social structure is produced. If we remove the artefacts, the structures will erode" (Sørensen 2004: 10). However, this does not mean that the artifacts/technologies are to determine behavior. If people feel that technology is taking over, then this is a result of human actors delegating too much decision-making to technology. The connections must be understood as products of negotiations between human and non-human actors, whereby meaning and moral, things and technologies are in constant change (Latour 1988, 1992; Callon 1987; Sørensen 2004).

Technology semiotics – program and anti-program

ANT represents a material and extended version of semiotics, also called "relationism" or "associationism," which studies how things/phenomena become what they are as a result of the relationships they exist in (Asdal et al. 2001; Latour 1988). In other words, the surrounding networks or associations of human and non-human actors determine the development of issues such as household energy consumption and energy efficiency. "An actor in ANT is a semiotic definition – an actant –, that is, something that acts or to which activity is granted by others" (Latour 1988: 5). Accordingly, actors and entities have no built-in qualities or essence, in themselves. There are no defined anchor-points; everything is in constant motion. The actants are given meaning only in relation to other actants (Latour 1988; Sørensen 2004).

From this post-structural perspective, I understand the challenges concerning energy consumption and energy efficiency as expressions of the relationships

that are made or not made between the different actors involved. In other words, it is the heterogeneous associations or networks surrounding household energy consumption, energy technologies and energy practices that produce meaning. This comes from an understanding of technology as something open and fluent, with the quality of technology brought forward by the network the technology is part of (Latour 1992, 1988; Sørensen 2004). For instance, the fact that the bus is a public transportation service makes sense only when people actually use it to travel from one place to another – namely when the bus is encircled by a network of expectations and relations. In this way, technologies never work for themselves, but only work for others (Sørensen 2004).

Technology semiotics in ANT focuses on the interaction between the designers and users of technology (Sørensen 2004). According to Latour (1992), the designer constructs a narrative structure or a program that says something about how the technology is supposed to be used. Through this program, the designer defines specific actors with certain interests, competences, motives and tastes. In this way, technology is equipped with a kind of manual description – a script – that predetermines connections and movements according to the way the designer has pictured it to be:

> The technical realization of the innovator's beliefs about the relationships between an object and its surrounding actors is thus an attempt to predetermine the settings that users are asked to imagine for a particular piece of technology and the pre-scriptions (...) that accompany it. (Akrich 1992: 208)

The concept of "program" implies that, when introducing new technology, designers attempt to control users by developing certain possibilities for action and restricting others. Thus, designers enrol users by motivating, persuading and "seducing" users, so the technology or the system appears attractive (Latour 1992). Users, on the other side, want to employ technology for their own purposes. They wish to construct their own connections and movements, their

own narrative structures or programs, without necessarily directly engaging in the designers' programs (Latour 1992; Sørensen 2004).

However, nothing can stop the user from behaving differently from how the designer's program advocates. This form of adversity/opposition is what Latour (1992) labels "anti-program." The concepts of program and anti-program demonstrate how designers and users develop different strategies for options of actions related to a technology. The designer tries to develop programs or scripts that add certain qualities and values to the technology and the user. The user, on the other side, can develop counter-strategies by creating anti-programs (Latour 1992). In this way, there is a risk that a gap will occur between the designer's imagined user and the actual user. In the creation of programs like energy efficiency policy, it is therefore important to map users in order to avoid anti-programs. Latour (1999) claims that users know what they are doing. The challenge is to learn from what they are doing, how they do it and why.

According to Akrich (1992), technological objects contribute to building heterogeneous networks in which both human and non-human actors are brought together. In order to reveal the connections between technological innovations, user representations and the actual use of technology, we must follow the negotiations between designers and users and examine how the results of negotiations transform into technological products. Akrich emphasizes that we should not limit our focus to the different points of departure of the designer and the user, but we should rather move between the designer's script and the real user: "the world inscribed in the object and the world described by its displacement" (Akrich 1992: 209). By studying the negotiations between designers and users we gain insight into how a technology (or program/policy, e.g. energy efficiency) is created, adjusted, maintained and stabilized.

The concepts of program/anti-program and script provide us with interesting entry points for studying the interaction between designers and users of household energy consumption. By investigating the program that is related to energy consumption and energy efficiency, we can gain insights into the

mechanisms of discipline that the political technologies express. Further, we can examine whether the discipline of the users works as it is supposed to by studying consumer practices: How do energy household consumers behave? Here, we can look for possible anti-programs that express users' relationships to energy efficiency issues. To what degree do users enrol themselves in the designers' (policymakers') program of energy efficiency?

However, in this dissertation I am not only interested in exploring the relationship between the designers and users of energy efficiency programs/technologies. An important part of understanding household energy consumption is to grasp the meaning of how people make sense of these issues in dialogue with their surrounding contexts. How do household consumers' connections to the outside world contribute to their shaping of energy practices? In order to study the dynamics between household energy consumption and external factors, it is appropriate to consider Michel Callons' concepts of framing and overflows (1998), briefly introduced in the overview of previous research regarding household consumption of energy. Also, this approach may function as an effective tool for analyzing the different framings of household energy consumption and energy efficiency made by policymakers/economists and household consumers, which result in certain programs.

Framing and overflows

When analyzing the dynamics of markets, economics and sociology, Callon (1998) points at "externalities" as an important concept for reviewing the conditions required for the existence of markets. Within the economic tradition, externalities are first and foremost associated with "market failures," meaning projects or investments that have not been accomplished in an economically efficient way. According to Callon (1998), however, externalities can lead to both positive and negative consequences. With this acknowledgment in mind, he argues for a new contract between the disciplines of economics and constructivist sociology.

Callon (1998) claims that constructivist sociology can improve the calculation of externalities, which is important for market activity to function optimally. In order to analyze the dynamic processes in the market, including the handling of externalities, Callon applies the sociological term "framing". As previously noted, this concept is borrowed from Goffman (1971). In a traditional sociological setting, framing is an expression of how interpersonal relationships are defined and described. The term is used to analyze how actors frame or stage interactions with other people, apparently more or less independent of their surrounding context. Primarily, the framing process comes out of the relations and commitments between actors, but Goffman (1971) also shows that the framing process is rooted in the outside world.

According to Goffman (1971), framing can be understood as a result of the actors' networks and connections to the outside world. New interactions are shaped and defined based on earlier experiences. Callon (1998) moves the framing concept out of its sociological frame and over to an economic setting. Within this field, framing serves as an instrument for defining economic and market-related phenomena. For this matter, Callon brings out the concept of "overflows," which are externalities that run over the economic frames. By analyzing the framing process, overflows can be identified and contained. The relationship between framing and overflows is, however, understood differently in economics and sociology. Callon points to two rather contrary approaches that are based on completely different interpretations of how framing and overflows interfere with each other.

The first approach takes the view that framing is the norm, while overflows represent leaks. In this approach, framing is a norm in a double sense: it is both desirable and statistically predominant. Overflows, on the other hand, are understood as exceptions or accidents; they disturb the normal framing process and must be contained and channeled with the help of appropriate investments. This attitude focuses on the interactions and connections between actors, without considering the factors that sustain these interactions:

> Framing defines the effectiveness of the market because, in this closed interactional space, each individual can take into account the viewpoint of every other individual when reaching a decision. In this sense, it is possible to assert that externalities are simply the results of imperfections or failures in the framing process. (Callon 1998: 5)

Accordingly, in economic theory, an important aspect in the construction of frames is avoiding overflows, since these externalities are perceived as negative risks.

From the second perspective – typical of constructivist sociology, in particular – overflowing is the rule. This approach, which is the exact opposite of the economic approach, shows that the framing process is deficient. However, it also claims that framing would be less effective without these deficiencies: "Instead of regarding framing as something that happens of itself, and overflows as a kind of accident which must be put right, overflows are the rule and framing is a fragile, artificial result based upon substantial investments" (Callon 1998: 6). This must be understood as part of the "dual nature" of framing: elements that contribute to stabilizing and structuring the frames of interactions are also sources of overflows. Apparently, actors participate in constant re-configuration processes through their networks and connections to the outside world. The re-configuration processes, or the actors' continuous negotiations with overflows, make the framing productive.

In other words, framing should not externalize objects, phenomena and knowledge that emerge through actors' networks and connections with the outside world. In order to embed or integrate the overflows in the processes of framing, the externalities must be made measureable: "Without calculative agents and without the minimum level of information that allows such calculations to take place, market coordination is bound to fail" (Callon 1998: 8).

This explains why economists are concerned with defining the conditions in which actions become calculable, and think up devices that will encourage such externalities to emerge. According to Callon (1998), constructivist sociology's focus on externalities, both in terms of costs and benefits, highlights the importance of the operations required to identify and measure these overflows. The constructivist-sociological perspective raises important questions in regards to the existing mechanisms used to create frames, by suggesting new methods and approaches that might help develop or confine spaces of calculability.

According to Callon (1998), the market is a hybrid-collective of technology, science and humans, where there are no clear barriers between facts and values. Framing is thus a chaotic process. Callon (1998) draws a distinction between "hot" and "cold" situations. In hot situations, everything becomes controversial: the identification of intermediaries and overflows, the distribution of source and target agents and the way effects are measured. Cold situations, on the other hand, are "under control" and marked by agreement: actors are identified and interests are stabilized. As a consequence of the growing complexity in post-modern societies – and also the changed and more heterogeneous production of knowledge – the number of hot situations increases:

> Not only are "hot" situations becoming more commonplace, more visible and more pervasive, thereby indicating that our societies are now thoroughly permeated by the technosciences; but more importantly it is becoming exceedingly difficult to cool them down, ie, arrive at a consensus on how the situation should be described and how it is likely to develop. Externalities are at the centre of public debates with no obvious conclusions. (Callon 1998: 13)

In a "hot" world, which is becoming increasingly difficult to cool down, the work of economists encounters actors and actions that can no longer be easily calculated. This is the point at which ANT can contribute effective tools for analyzing the dynamics in these complex and confusing situations that

economists struggle with. By focusing on how actors construct and operate in connections and networks of science and technology, ANT can reveal how and when overflows arise and thus contribute to developing more appropriate processes of framing:

> Hence it (ANT) is in a position to keep track of controversies and the experiments they engender without giving precedence to any one point of view, whilst at the same time revealing the socio-technical maps produced by the actors involved as well as the progressive development of instruments for making world states calculable. (Callon 1998: 13)

It seems reasonable to assume that household energy consumption requires processes of calculation. However, many of the qualities characterizing consumer attitudes and behavior with respect to, for instance, energy efficiency and use, are not easy to measure numerically. These include features like needs, values, household infrastructure and so forth. When such elements are put inside the frame of calculations, problems emerge in the use of standard calculation devices. How can such properties be analyzed? Cochoy (2008) proposes that we replace calculation with qualculation. This is based on his study of supermarkets and shopping carts, which demonstrates how consumers transformed their calculation skills when transporting groceries through a store. Cochoy (2008) found that, during the process of shopping with a cart, consumers considered family needs, product qualities, market information and shopping equipment, in addition to economic considerations. Consequently, they engaged in processes of qualculations, or "quality based rational judgement" (2008: 17), rather than mere calculations. How do households engage with calculating or qualculating devices when framing energy consumption?

As already noted, ANT can provide us with interesting approaches for studying the framing processes concerning energy consumption and energy efficiency, as well as the resulting program (and anti-program) of energy efficiency: What is

contained within the program, and what is left as externalities and overflows? In this area of concern, externalities are at the centre of public debates with no necessarily obvious conclusions (as Callon puts it). By focusing on the complexity of households' energy consumption – how consumers perform constant re-configuration processes through their networks and their interaction with the surrounding contexts – externalities may be identified and analyzed. In the following section, the four papers that form the core of this thesis are examined, as a whole, to show how a cross-cutting analysis may contribute to illuminating the abovementioned problem and the overarching issue of energy efficiency in households.

Energy efficiency in households: A cross-cutting analysis

The four papers in the thesis illuminate the issue of energy efficiency from the different perspectives of economists, policymakers and consumers. This issue has remained a constant challenge for at least four decades (Sørensen 2007), politically, as well as academically. As the literature review demonstrated, insights from the social sciences contribute to a more comprehensive understanding of attitudes and behaviors among consumers, compared to the established economic approach that has guided most of the policymaking in this area. This contribution has typically produced a critical reading of energy efficiency policies directed at households, above all by pointing at the way in which socio-cultural dimensions of energy use are externalized by the dominant framing of energy consumption.

The literature review identified five alternative ways of framing, based on social science research. However, the identified frames do not represent a unified approach to social studies of energy consumption. Instead, they deal with issues of energy attitudes and actions, empowerment and responsibility in rather different ways. Nevertheless, one common feature of social science research is the predominant focus on various barriers to energy efficiency and reduced energy consumption. Mainly, this research has tried to explain why energy efficiency incentives do not work in the way that they should, by pointing to

social and cultural factors that tend to make policy instruments less effective in changing the way household consumers use energy. For example, higher levels of information do not lead to more energy efficient behavior; energy efficiency incentives should not focus only on the individual consumer; energy policymakers do not represent climate change in ways that make the problem relevant to people and thereby inspire political action, and so forth. This thesis is an effort to go beyond the rather pessimistic outlook on energy consumption that has been produced by previous research by highlighting ongoing dynamic processes within the actor-networks of household energy consumption: How can we identify and understand the possibilities for change?

The four papers included in this thesis all engage with issues of household energy consumption and energy efficiency, but from different angles. The first paper demonstrates how policymakers constructed household energy consumers over a period of 30 years: How did they frame household energy consumption? The second paper explores the differences between economist policymakers in the energy area and consumers with respect to their framing of energy consumption and the electricity market, thus comparing two sites where such a framing is made. The third paper investigates how climate concerns influenced households' domestication of energy consumption. Did it change? Finally, the fourth paper examines the sense-making processes of households with respect to their energy consumption and demonstrates the importance of moral arguments in understanding how household consumers deal with energy issues in their everyday lives.

Thus, a main advantage of this thesis is the combination of several research sites in the analysis of how energy efficiency issues are dealt with. Accordingly, I trace the topic of household energy consumption and energy efficiency through multiple social spaces, using a multi-sitedness approach (Marcus 1995). Although my main data is focus group and expert interviews, I also lean on a consumer survey, document analysis and a re-analysis of existing data (survey and interviews). This allows for interesting comparisons, above all to explore and compare the ways in which energy efficiency in households may be framed

differently when the issues are observed from different vantage points. For example, my approach recognizes an investigation of the co-production and lack of co-production with respect to policymaking and energy practices in households. Is the long-standing energy efficiency problem found in the (lack of) dynamics between policy and practice, and/or is it found in overflows due to the unfortunate externalization of social and cultural factors? In what follows, I explore the dynamics between the two main vantage points – from "above" (policymakers) and from "below" (household consumers) – through the concepts of program/anti-program, co-production, framing and domestication theory. How are household energy consumption and energy efficiency framed? What elements constitute the program and anti-program of energy efficiency in households?

As we have learned, the concept of "program" implies that designers (in this context policymakers) attempt to discipline users through particular technological features (the technology of policy instruments to stimulate, in this case, energy efficiency). Through their program, designers define specific actors with certain interests, competences, motives and tastes. However, users may develop anti-programs or counter-strategies that render the initial program less effective (Latour 1992). Thus, the analysis is based on an interpretation of the policymakers' program of household energy efficiency as a set of political technologies. According to Foucault (1977), political technologies may represent strategies of governmentality that indirectly discipline citizens by rendering some forms of behavior more rational or moral than others through information campaigns and other forms of political incentives. Asdal (2008), however, suggests that political technologies should not be understood only as techniques of domination, but also as tools for public involvement.

In order to understand how actors shape a program or anti-program of energy efficiency in households, we must investigate how policymakers and household consumers frame the issue. What elements of household energy consumption and energy efficiency are internalized and externalized in the framing processes?

What does this mean for the making of a program and anti-program regarding energy efficiency? The cross-cutting analysis will focus on the following:

1. A re-construction of the program of politicians, policymakers and economists – papers 1 and 2 show that these groups may be analyzed together – made to influence energy use and energy efficiency activities of household consumers. How is household consumption framed? How can the program of energy efficiency be characterized?
2. An analysis of how household consumers respond to this program using the concepts of anti-program and domestication. Do consumers domesticate any of the elements in the policymakers' program or do they construct their own anti-program of energy efficiency?
3. An investigation of the co-production of households' energy policy and energy efficiency activities. How do the different framings of energy consumption and energy efficiency interact? What is the interaction between the program and the anti-programs (if the latter exists)?

The political framing of household energy consumption and the making of a program for energy efficiency

A political technology to increase the energy efficiency of households would involve a program that inscribed wished-for ways of behaving with respect to the use of energy and ways of achieving better energy efficiency. The first step in analyzing what such a program would contain is to investigate how policymakers (including politicians and economists) frame energy efficiency and energy consumption. In papers 1 and 2, a main finding is that this framing is primarily concerned with the characterization of household consumers. The first of these two papers shows how the political construction of energy users changed over the course of three particular phases of Norwegian energy efficiency policy, and how these constructions involved controversy. We observe in the paper that Norwegian policymakers produced ambiguous and fairly vague constructions of consumers, which may be interpreted as efforts to frame

household energy consumption and energy efficiency. How can we characterize these ways of framing?

The dominant frame was that of the energy consumer as homo economicus. This frame was developed through the work of a government commission in 1974–1975, led by a prominent economist, Professor Einar Hope.[12] The Commission's proposal framed energy consumption mainly in economic terms, through the concept of economically efficient energy use. The homo economicus frame resulted in a focus on consumers as market actors who react to prices in line with textbook economics: if electricity prices are increased, households will reduce their energy consumption. Thus, consumers were supposed to be disciplined by the market to spend less energy through price-related calculations.

In general, this frame was accepted by the large majority of MPs. However, quite a few MPs thought that this framing was too narrow. They doubted that consumers would be sufficiently disciplined by price signals. According to them, household users knew too little about how to interpret prices and what alternatives were available to saving electricity. Moreover, several felt that people had grown accustomed to comfort, and thus they questioned people's willingness to assume a moral responsibility for conserving energy. Thus, a supplementary framing was articulated, which added to the homo economicus frame. Consumers were expected to be price-sensitive and thus potentially economically rational energy savers, but, at the same time, they were constructed as having two important shortfalls: a knowledge deficit and a moral deficit; both of these shortfalls were thought to potentially mitigate energy efficiency measures. These deficiencies, when integrated in the frame, would have to be addressed by additional instruments catering for information about and motivation to engage in energy efficiency.

[12] NOU 1975: 49 Om tiltak for energiøkonomisering.

As demonstrated in both papers 1 and 2, household consumption of energy was not considered particularly important to arguments for the deregulation of the electricity market. The main arguments focused on the potential for increased economic efficiency in the overall trade in electricity. However, the parliamentary debates in 1989 about the new Energy Act showed that the framing of consumers was becoming more controversial. The centre-right government used a singular homo economicus framing, while the centre-left opposition emphasized consumers' right to buy the electricity they needed at a "reasonable" price. Thus, the opposition framed household consumers as needing political care. The knowledge and moral deficits were, at this point, seemingly externalized by both parties in the debate.

Paper 1 traces yet another reframing of household energy consumers in the aftermath of the electricity supply crisis in the winter of 2002–2003. Arguably, this reframing involved a merging of the homo economicus and political care frames. Household consumers were seen to have a right to buy a sufficient amount of electricity at a stable and reasonable price. In 2006, the Labour government brought forward a white paper that extended the homo economicus frame to include household consumers as potential investors in energy efficient technologies. Consumers were still expected to react rationally to price changes, but they were also stimulated to invest in technology to make their homes more energy efficient. This represented a more inclusive, but still predominantly economic, framing of household consumers. Consumers were expected to react to price changes, but also to information and subsidies encouraging investments to improve the energy quality of their households.

While policymakers have somewhat changed their framing of household energy consumers over the last four decades, the homo economicus frame has remained dominant. However, the resulting program of improving the energy efficiency of households has contained some diversity of inscriptions. The main feature is the deregulated market, through which consumers are supposed to enact price consciousness and adjust their demand for energy accordingly. Policymakers have considered increased electricity prices as their main instrument to

encourage energy efficiency. In addition, their added emphasis on framing consumers as investors in energy efficiency technologies has made subsidies and information efforts important instruments (cf. the introduction about Enova). We also see, more generally, that the need to counter information and moral deficits is inscribed in the program through campaigns to inform people about and motivate them to engage in energy efficiency. The framing of the potential need for political care to help consumers get sufficient electricity at reasonable prices is not visibly enacted in the program, as we learn from both paper 1 and paper 2.

As already noted, Latour's concept of "program" stresses that programs should be unambiguous and clear-cut in order to be effective. The partly changing ways of framing household energy consumers by Norwegian policymakers (and politicians) have led to the creation of a program that articulates some ambiguity with respect to the way energy efficiency actions are inscribed. Furthermore, the inscriptions do not appear to be very effective. This may follow from a lack of disciplining power, and, also, as argued in paper 2, from misunderstandings or mismatches in the ways in which household energy consumption is framed by policymakers, rather than consumers. The next section investigates how household consumers domesticate (or not) the energy efficiency program of policymakers.

The domestication of the energy efficiency policy program and the emergence of an anti-program

To domesticate energy consumption and energy efficiency, people must negotiate the meanings and practices of these matters in a dynamic, interactive manner that makes sense within their own cultural frameworks (Sørensen et al. 2000). When domesticating the energy efficiency policy program outlined in the previous section, household consumers framed the issues involved as a result of their sense-making activities. This domestication resulted in acceptance, rejection or transformation. Should we, on the basis of papers 3 and 4, conclude

that the outcome of this domestication was an anti-program that rendered the energy efficiency policy program ineffective?

Paper 2 demonstrates how policymakers and household consumers framed the issue of household energy efficiency quite differently, because their framing of the deregulated electricity market diverged quite markedly. The interviewed economists drew, in both cases, on the homo economicus frame, which is based on the understanding that energy efficiency activities are dependent on rational economic calculations. However, their program also aimed at providing consumers with the correct information and possibilities for choosing a supplier, which was viewed as essential for economically rational energy consumption. Thus, consumers were framed as calculating actors.

In contrast, the interviewed consumers articulated a framing of energy efficiency that emerged from their framing of energy consumption. In this way, they focused on the process of consumption and its outcomes, rather than the decision-making of consumers. Their framing of energy consumption and energy efficiency in households was much more inclusive than the one we observed in the previous section, integrating moral views as well as economic concerns. This produced qualculation – in contrast to calculation – activities, which include a variety of moral concerns, including individual rights and collective fairness. This may be interpreted as the making of an anti-program to allow for moral considerations when dealing with the electricity market and energy efficiency concerns.

This argument is supported by the findings from paper 4. In this paper, we again observe how economic rationality was downplayed in interviewees' framing of energy consumption and energy efficiency. Interviewees emphasized moral considerations, mixed into a pattern of practices that allowed for everyday life to be made convenient. The resulting anti-program inscribed a set of guiding beliefs or values – an ethos of energy efficiency – that paved the ground for articulating non-economic arguments related to decisions about energy consumption and energy efficiency. This ethos, produced through the domestication of energy

efficiency, consisted of mainly four partly conflicting moralities concerning: (1) saving, (2) needs, (3) merit and (4) entitlement, with respect to energy.

Obviously, as paper 4 points out, it was crucial to the interviewees to present themselves and their opinions in a way that recognized energy efficiency as an important concern in their everyday lives. Through a "morality of saving," emphasizing thriftiness, many of them argued that energy saving was crucial for economic, as well as for environmental, reasons. Thus, they domesticated politically or morally "correct" energy practices in a symbolic way, showing that they were quite aware of the environmental consequences of their actions. Some of the interviewees also expressed guilt related to (for example) traveling by airplane or driving a car too often. In this way, their anti-program of energy efficiency recognized energy saving as important – especially due to environmental concerns (see papers 3 and 4). Besides this recognition, what was inscribed in the anti-program?

To answer this, we may turn to paper 4, which helps us see how consumers' framing of energy efficiency, emphasizing a morality of saving, was moderated by other moral concerns. First, the interviewees articulated a "morality of merit," through which efforts to save energy in some areas, like not driving a car, merited less concern about energy use in others, like taking long showers. Further, many of the interviewees claimed to lack possibilities for saving energy, leaning on a "morality of needs," which also mitigated the morality of saving. This morality implied that household consumers had to use whatever energy they were currently using in order to manage their everyday lives in a convenient way. Finally, the morality of saving was moderated by a "morality of entitlement." Within this reasoning, access to plentiful energy was seen as a self-evident privilege: household consumers had a natural right to use all the energy they needed to enjoy everyday life without having to justify their energy practices.

We learn from papers 3 and 4 that the interviewed consumers also framed energy efficiency in terms of fairness and responsibility. These concerns had

different effects than did the three mitigating moralities. As already noted, environmental considerations were critical for acknowledging the importance of energy efficiency, which reinforced the morality of saving. However, this concern also raised issues related to fairness in the distribution of responsibility: What actors should take the lead? How should responsibilities be shared? Many interviewees felt that their personal actions did not matter much in a global context, and expressed frustration and powerlessness. Also, they felt provoked by policymakers and industrial actors, who they claimed were expecting consumers to act on energy efficiency challenges but did not take action, themselves. In this way, some consumers externalized responsibility for action when framing energy efficiency. However, not all interviewees subscribed to this externalization. They argued that everybody is obliged to do what they can to help solve the climate mitigation problem, and that it is easier to change individual practices than to improve the energy efforts of actors such as large industrial companies.

Thus, we cannot say that the domestication of energy efficiency policy led to a homogeneous anti-program. As we have seen, ambiguous and potentially contradictory features were inscribed. On the one hand, the morality of saving encouraged energy efficiency, albeit for different reasons than those inscribed in the policymakers' program of energy efficiency. An example of this can be found in the role of environmental concerns, as observed in paper 3. On the other hand, mitigating moralities were also inscribed. Often, household consumers *wanted* to save energy, but needs, merits and entitlements evened out their efforts in everyday life practices. These mitigating moralities led to a domestication of the policymakers' energy efficiency program that tended to make this program ineffective.

In line with the integration model (Irwin and Michael 2003), household consumers tended to make sense of energy consumption and energy efficiency in ways that were in harmony with and could easily be integrated into their everyday lives. The outspoken inconsistency between the policymakers' and consumers' respective framings of household energy consumption was a result

of this. Policymakers' framing was narrow, in order to allow for calculation. Consumers' framing tended to be wide – usually too wide for calculation: they had to qualculate. This raises the interesting issue of overflows. Was the framing of the studied policymakers too narrow? Was the framing of the interviewed consumers a result of a lack of information and understanding, or should we phrase the challenges in a different way?

Overflow or lack of understanding?

Let us start with the overflow question. Clearly, the policymakers' program of energy efficiency did not accommodate the interviewed consumers' outspoken need for bringing non-economic concerns to the table. As we saw in paper 2, this problem was related to the different ways of framing electricity, either as an economic commodity (as done by the economists) or as a public good (as done by the consumers). The first was the basis of designing the liberalized market for electricity; the latter could be seen as an outcome of historical experience and the consequent expectation of electricity supply security. Arguably, it would not have made sense to design the deregulated market without the commodity framing. Maybe the overflow diagnosis is too simple?

What kind of program would have offered an effective response to the framing of consumers? Given the diversity of domestication outcomes with respect to energy efficiency, there seems to be no simple answer to this question. What would have been a better response to the observation that consumers are qualculating, rather than calculating?

Paper 2, based on statements from policymakers and economists, suggests the simple answer that there is no need to worry about this discrepancy. If consumers decide not to act like homo economicus, then that is their problem. The market construction, as such, is not threatened by this. From this perspective (of economists and policymakers), it does not really matter if consumers produce an anti-program. However, achievements in household

energy efficiency may be less than they could have been. In light of the emphasis put on this goal – not the least related to climate change concerns – the no-need-to-worry response seems unsatisfactory.

Paper 2 suggests the conclusion that policymakers – in particular economists – and household consumers of electricity live in two different worlds. These worlds may co-exist without serious trouble as long as electricity is provided in sufficient amounts without becoming expensive beyond consumers' willingness to pay. However, to reach the more ambitious goals with respect to energy efficiency, the policymakers' program of energy efficiency should change. At the outset, one could ask why – after nearly 25 years of experience with the deregulated electricity market – no comprehensive changes in the program have been made.

There are at least three answers to this question. First, the overflows from the narrow economic framing of energy, as well as the energy efficiency in households, have not been considered sufficiently problematic for the framing to be re-considered. With the exception of a few periods in which the price of electricity caused widespread protest, the supply of electricity has generally been considered satisfactory. Second, there has been no real worry about a lack of achievement with respect to energy efficiency. Arguably, the energy efficiency issue has never been high on anybody's political agendas – with the possible exception of some ENGOs.

Third, and more interestingly, it might actually be that the policymaking program of energy efficiency is changing. As noted in the introduction, the directorate responsible for energy efficiency, ENOVA, has begun to modify their approach to accommodate the importance of non-economic issues in energy efficiency activities. Paper 3 demonstrates that the sense-making or symbolic domestication of household energy consumption and energy efficiency has changed over the past 20 years due to the widespread acknowledgment of human-made global warming. In the early 1990s, climate change issues were barely mentioned and energy use was largely not seen as a problem (also

because Norway was considered rich in energy sources). In the late 2000s, when concerns about climate change became much more prominent, energy consumption was rendered more problematic. This was also because Norway had begun to import electricity on a substantial scale, which meant that electricity could no longer be considered unambiguously clean. Rather than claiming a widespread acceptance of energy saving and energy efficiency as important household tasks, paper 3 shows that energy consumption, above all, became more a matter of concern than it ever had been previously. This concern is a resource for policymaking.

However, there are important challenges related to issues of fairness in the sharing of responsibility. Papers 3 and 4 demonstrate critical comments about a lack of political engagement from the government. Thus, the responsibility to act could easily be externalized from consumers' framing of energy efficiency. Also, these papers show that there was a fairly widespread reservation with respect to how serious climate change challenges actually were. If global warming was really that alarming, then why were there no limits on energy use? Clearly, many household consumers called for a more prominent and outspoken energy efficiency policy to regulate energy consumption in a fair manner by effective political technologies. Above all, it was thought that consumers should not be easily allowed to pay their way out of participating in what should be a common effort. ENOVA is not able to cater for such concerns, but they seem to be engaging in reforming their approaches to energy efficiency away from a fairly unilateral economic approach.

Obviously, there is a lack of co-production between policymakers' framing of household energy consumption and energy efficiency, and households' practices, suggesting that these two groups live in rather separate spheres and represent different worlds. The lack of co-production means that the program is ineffective. Regardless of the electricity market's ability to supply and distribute electricity, the long-term lack of interest in actually understanding how consumers think and act is striking and worrying. This is why a more comprehensive social science effort is needed to provide an understanding – not only of consumers'

reasoning about their use of energy, but, above all, of the relationship between such knowledge and the making of more effective political instruments to achieve energy efficiency. In the end, it is the responsibility of policymakers to see this happen.

Conclusion: Possibilities for change?

According to Hille et al. (2011), Norwegian households have reduced their overall energy consumption. One explanation for this reduced energy consumption is a reduction in the average living space. Another possible explanation is that energy efficiency is a free-rider on the extensive refurbishment efforts made by Norwegian households. The four papers in this thesis, taken together, offer additional explanations.

This thesis offers an ambiguous picture of public and private efforts to increase energy efficiency in Norwegian households. To begin, as we have seen, energy efficiency policymaking seems to have been fairly ineffective. This is due to a nearly unilateral belief in economic instruments and, in particular, the establishment of a deregulated electricity market. However, policymakers and economists do not seem to have worried much about ineffective instruments, nor do they seem to have been concerned with getting their dominant image of household energy consumers – the homo economicus – empirically corrected.

There may be several reasons for this. Clearly, as was demonstrated in paper 2, the energy efficiency of households was a marginal concern in the deregulation of the electricity market. Also, from the perspective of economists, this market would work even if it did not discipline consumers in the expected manner. Furthermore, as we saw from papers 2 and 3, when people were asked about their energy consumption, their initial reaction was to provide calculation-oriented accounts centered on economic issues. Only later in the interviews did they produce a much more comprehensive framing of energy consumption and introduce moral reasoning and qualculation. Presumably, the spontaneous

enactment by many people of the homo economicus role had dominated the public discourse.

Nevertheless, we learned from papers 2, 3 and 4 that, despite resistance to energy efficiency policy measures, many people were interested in saving energy and were actually doing so, to the extent that it did not demand radical changes in their everyday lives. They were even willing to engage in energy saving behavior more fully (paper 3), but doing so was thought to require energy efficiency measures that would secure fairness in terms of effort. In other words, people thought that everyone should have to engage in energy efficiency. The underlying issue was energy efficiency as part of necessary climate change mitigation efforts. This shows the importance of thinking in terms of qualculation when developing new policy instruments.

Thus, as we have seen, the possibility for change with respect to Norwegian households' engagement with energy efficiency lies in the interaction between public discourse, policymaking and everyday life concerns. Climate change is of particular importance, as is climate change policies. Comfort and convenience are important and strongly embedded features of modern everyday life, but such concerns are flexible and may be negotiated if they are publically addressed in ways that help people identify what they can do. As we have seen, present policies are not seen to be particularly helpful in such respects.

A sign of change may also be found in the Norwegian energy efficiency directorate Enova's effort to modify their strategy. As demonstrated in the introduction, the company has tried to broaden their framing of household energy consumers to include non-economic issues. For example, they argue that energy efficiency measures may improve consumers' quality of life. If these efforts are extended to include a more explicit focus on climate change concerns, as well as moral issues related to energy consumption, they may indicate a step in the right direction.

Methodology

This thesis is part of a larger research project named "Building markets, shaping policy? The role of economics in energy policy and energy use." The project started in 2008 and is funded by the Research Council of Norway (NFR), Enova, NVE, Trondheim Energi/Statkraft, SINTEF and NTNU. The project group has consisted of Henrik Karlstrøm, Margrethe Aune, Marianne Ryghaug, Knut Holtan Sørensen and myself, all of whom are engaged at the Center for Technology and Society, NTNU. In this project, we have empirically studied the extent to which economists have been able to influence policymaking in the energy area and the outcome of their advice. In order to analyze the interaction between economists and policymakers, as well as the relationship between policymakers and household consumers, we have gathered rather extensive amounts of data. The data material, which I will present in the following section, has thus been collected, used and shared throughout the research project as a whole (for instance, see Karlstrøm 2012).

This thesis explores, more specifically, Norwegian household energy consumption and energy efficiency. In order to investigate how household consumers are expected to act when dealing with energy efficiency and the electricity market, as well as how consumers domesticate energy consumption in their everyday lives, I followed these issues through different field sites. This method of data collection, which typically requires the use of additional methods like interviews, surveys and document analysis, is inspired by the concept of multi-sited ethnography (Marcus 1995). Differing from traditional ethnography, multi-sited ethnography follows a research topic across numerous spaces – social or geographical – for shorter periods of time. In my study, I gathered data material from various social spaces that highlight different energy actors' perspectives on household energy consumption: (1) household consumers, (2) economists, and (3) policymakers.

First, in order to gain insight into household consumers' attitudes and behavior with respect to energy use, I conducted nine focus group interviews (dataset #1).

Second, together with my colleague, Henrik Karlstrøm, I conducted 15 individual interviews with economists and people with complementary expertise about the deregulated electricity market (dataset #2). However, the analysis draws only on the 12 economists who were interviewed. In addition to the focus groups, household consumers' perspectives were also covered by a survey of 1,500 respondents (dataset #3). Furthermore, I (and my co-authors of paper 1, Henrik Karlstrøm and Knut H. Sørensen) used document analysis to study how policymakers constructed household energy consumers (dataset #4). Finally, I (and my co-authors Margrethe Aune, Knut H. Sørensen and Marianne Ryghaug) re-analyzed existing data in paper 3 (survey and interviews), which offers a historical comparison of energy cultures and the domestication of energy (dataset #5). The focus group interviews (dataset #1) and the expert interviews (dataset #2) are the main sources in this thesis, while the survey (dataset #3), the document analysis (dataset #4) and the re-analyses of existing data (dataset #5) were supplementing sets of data. In the following, I present the different research methods and data used.

Focus group interviews (dataset #1)

According to Morgan, a focus group interview can be defined as "a research technique that collects data through group interaction on a topic determined by the researcher" (1998: 6). This rather inclusive approach points to the interaction within the group as a decisive element of data production. However, the interaction and interview conversation are based on topics defined by the researcher, who also serves in the role of moderator. This definition of focus group interviews implies that the researcher's interests determine the focus of the interview conversation, while the data material is produced through interaction within the group (Morgan 1998).

An important goal of focus group interviews is to gain insight into participants' attitudes and opinions about the research topic of interest (Krueger 2009; Morgan 1998; Stewart 2007). Since accounts and opinions are produced and clarified throughout interviewee interactions, focus group interviewing is a well-

suited qualitative method for exploring attitudes and concerns. Furthermore, it is a constructive tool for learning about interviewees' experiences and perspectives. According to Morgan (1998), researchers can gain this insight by focusing on interviewees' concrete self-made experiences and avoiding vague generalizations about the research topic. When interview participants share and compare their own thoughts and experiences, the social interaction within the group produces perspectives and insights that would not have emerged otherwise (Morgan 1998).

The focus group interview's reliance on the researcher's focus and the group's interaction represent the strengths and weaknesses of this research method. If the researcher manages to direct the focus of the interview discussion, focus groups can give concentrated amounts of data on precisely the topic of interest. However, in the name of maintaining the interview's focus, there is a risk that the moderator and her/his interests might influence the meaning production in the group interaction. Likewise, the focus group's reliance on the interaction in the group to produce data represents both a strength and a weakness. The comparisons that participants make among each other's experiences and opinions are valuable sources of insight into complex behaviors and motivations. Still, it is important for the researcher to question how the group's interaction influences the discussion and data production: How does the presence of the group affect what the participants say and how they say it (Krueger 2009; Morgan 1998)?

In order to learn about Norwegian household consumers' practices and preferences concerning energy consumption and energy efficiency, I engaged in nine focus group interviews. All of the interviews were conducted in 2009. Altogether, 44 participants were interviewed: 19 women and 25 men. The participants provided considerable diversity with respect to age, gender, occupation and geographic belonging. There was also considerable variation in political views and knowledge of and attitudes towards energy efficiency and consumption. I discovered and recruited the participants through existing social networks and snowballing (Morgan 1997; Stewart et al. 2007). The interviews

took place at familiar locations, such as interviewee workplaces and homes, and they lasted for approximately one and a half hours. All interviews were taped and transcribed. In the articles, interviewees are referred to with fictive names so their anonymity is preserved. All quotes were translated into English by either my colleagues or myself.

Since the purpose of the focus group interview was to learn about participants' experiences with and perspectives on energy efficiency and energy use, I used a semi-structured interview guide that accommodated participants' own inputs (Morgan 1997). As a moderator, my role was to manage the discussions, follow up on interesting points and see that everybody had a say. The main topics in the interview guide were the participants' everyday energy consumption, their efforts to increase energy efficiency and their understandings and opinions of energy policy and the electricity market. The data analysis was inspired by grounded theory (Strauss and Corbin 1998). I examined the interviews for categories, which were each given a label or a code; I then grouped these codes to find related sub-categories that might be linked to more comprehensive categories. My main interest was in analyzing how household consumers domesticated energy consumption and energy efficiency.

Expert interviews (dataset #2)

According to Holstein and Gubrium (1995), interviews are social productions. From this constructionist perspective, respondents are seen as narrators or storytellers, while researchers are cast as participants in the process. Interviews can be used effectively for a wide variety of purposes, and they are particularly useful for getting the story behind a participant's experiences. Holstein and Gubrium claim that all interviews are interpretively active, implicating meaning-making practices on the part of both interviewers and respondents. We need to "acknowledge interviewers' and respondents' constitutive contributions and consciously and conscientiously incorporate them into the production and analysis of interview data" (Holstein and Gubrium 1995: 4). How does this affect how experts are interviewed?

The literature on expert interviews mainly refers to the social-constructivist tradition of the sociology of knowledge (Bogner et al. 2005; Klimek 2012). This approach targets the re-construction of implicit (latent) knowledge, in that the researcher must try to make the latent knowledge of experts visible through the conversation. Definitions of the term "expert" range from very broad, voluntarist definitions (everybody is an expert of his/her own life; e.g. Gläser and Laudel 2004) to narrow definitions (an expert disposes of specific knowledge that refers to the practical knowledge and experiences of a limited (professional) field). From this perspective, the expert is able to structure the concrete field of action in a meaningful and formative way (Bogner et al. 2005; Klimek 2012). Thus, the interviewer can pursue in-depth information around a certain topic by interviewing experts. How may the researcher proceed to extract this information?

The expert interview may be considered an instance in which the interview is set up in a particular way to accommodate a need for eliciting points of view related to the expertise of selected interviewees. The direct contact with experts – in my case economists and politicians involved in the deregulation process – can give a much better picture of their impressions than can any kind of standardized questionnaire or interview. However, in order to conduct expert interviews that produce meaning and knowledge in accordance with the relevant research questions, it is important to use an interview guide to help direct conversation towards issues of interest. Interview guides vary from highly scripted to relatively loose, but they all share certain features: they help the researcher know what to ask about, in what sequence, how to pose questions and how to pose follow-up questions (Gubrium and Holstein 2002; Klimek 2012).

In order to identify the intentions behind the electricity market, we interviewed people with relevant expertise on these matters: economists both in research and in government; politicians who had been part of the deregulation process; and professors of law who had issues with the legal design of the reform. All in all, 15 experts were interviewed over the period of February to December 2009,

including eight economists, two legal experts, one hydro systems engineer, two previous Ministers, one chief executive officer of a Norwegian energy company and one public servant in the Ministry of Petroleum and Energy. 12 of these have been labelled economists due to their professional training and/or experience. This was a strategic selection of people, chosen for their ability to say something substantial about the issue at hand. Some of the interviewees had been central in the process of deregulation; others had qualified opinions about the issues involved. This is not to say that everyone who had been involved in the deregulation process was interviewed. As deregulation had occurred 20 years prior, not all of the relevant actors from that time were available for interview. Also, it would have been too time consuming to interview all of the relevant actors. Still, I believe the present respondents gave an adequately accurate picture of where the thinking of the reform stood at that time, not least because their accounts showed so much agreement.

In order to find the right informants, we started out with actors who had contributed central documents regarding the electricity market. Furthermore, I used the so-called snowballing method (Morgan 1998; Krueger 2007; Stewart et al. 2007), wherein interviewees suggested other relevant actors to be interviewed. These individual interviews, which were qualitative and semi-structured, lasted one to two hours and were taped and transcribed. The semi-structured interview guide focused on respondents' engagement with deregulation and its consequences. Accordingly, we asked questions about the experts' and politicians' role in the process, and their opinions on the way the system had been designed to function and also how it had actually turned out. The main goal was to investigate the purposes of the prime movers and shakers behind an important political reform: What were the intentions behind the creation of the electricity market?

The expert interviews have been used by various means in the research project "Building markets, shaping policy? The role of economics in energy policy and energy use"; however, for the purpose of this thesis, my analysis focused on economists' framing of household energy consumption. How were household

consumers supposed to act in this deregulated electricity market? The interviews were analyzed using simple qualitative content analysis, as described in White and Marsh (2006), to establish the overarching themes of interest. Together with an examination of the regulatory documents attached to the Energy Act, this was thought to provide sufficient information about the different considerations of household energy consumers that went into the construction of the deregulated electricity market.

Survey (dataset #3)

In order to map how household consumers made sense of energy consumption and energy efficiency, including their relationship to the deregulated electricity market, colleagues and I also conducted a consumer survey with help from a call center. This was a representative, quantitative telephone survey of 1,500 Norwegian electricity users, which was conducted in 2009. The person responsible for paying the electricity bill of the household was chosen as a respondent, as we considered it likely that this person would know most about the household's electricity consumption and behavior. The survey consisted of 38 questions concerning electricity consumption, market attitudes, environmental issues, supply security, political control over the energy sector and different sources of energy.

Accordingly, the survey provided data about everything from how often household consumers changed electricity utility and their thoughts on what an acceptable price for electricity was, to how they considered environmental concerns and what they thought of renewable energy technologies. Using this survey data, one of my colleagues constructed an index of Norwegian electricity users' market orientation and ran an ordinary least squares regression analysis against a set of background variables. This analysis examined the ways in which electricity users could be said to have learned to act according to the expectations of the market designers. Also, it offered insights into the attitudes and beliefs of household consumers in relation to climate concerns, energy

consumption and the responsibility share of energy efficiency efforts, which is relevant for the topics in this thesis.

Document analysis (dataset #4)

In order to explore how economists and policymakers framed household consumers and their energy consumption, we analyzed government documents and parliamentary debates. Looking at how consumers were constructed as economic and moral subjects gave an insight into how the electricity market had been seen as a system by those responsible for putting it into place. We reviewed government white papers and legal preparatory notes – from the first period of energy efficiency legislation in the 1970s to the last discussion in Parliament in 2006 – and subjected these to a standard document analysis. Based on this review, we examined the development of Norwegian energy policy with a focus on issues related to energy efficiency – particularly with respect to households. This was done by analyzing parliamentary debates in Norway about energy efficiency measures directed at households between 1975 and 2008. All quotes from these documents were translated (by us) into English.

Re-analysis of existing data (dataset #5)

Finally, in order to investigate whether the focus on global warming had effected households' domestication of energy and their energy consumption, colleagues and I re-analyzed available qualitative interviews and survey material. Most of the researchers who had originally gathered the data also participated in the re-analysis (Margrethe Aune and Marianne Ryghaug). In paper 3, we compare how Norwegian households domesticated energy during two periods of time: 1991–1995 and 2006–2009. For the first period studied, we used a national survey of 1,050 persons that had been conducted in 1991. The survey was sampled to be representative of the Norwegian population. Also, we re-analyzed 34 in-depth interviews with altogether 60 persons that had been conducted in the period of 1992–1995. These interviews were part of a qualitative interview study of

energy consumption and everyday life, investigating how people perceived the energy situation at that time. Both sets of data are described in greater detail in Aune (1998). For the second period studied (2006–2009), we re-analyzed 10 focus group interviews with a total of 62 participants that had been conducted in 2006–2007. These interviews were primarily concerned with climate change issues, which included energy consumption. Further details are found in Ryghaug et al. (2011). Also, we referred to the survey presented above (dataset #2). Finally, this analysis was also based on the focus group interviews already presented (dataset #1).

One of the advantages of this multi-sited approach is that it allowed me to understand the dynamic interactions of household energy consumption through various levels of powerful decision-makers and consumers/users. By studying household energy consumption through different sites, I gained insight into the networks and negotiations that happened between them. In this way, my thesis seeks to offer a holistic perspective on the complex actor-network of household energy consumption and energy efficiency. Moreover, multiple research sites allowed for multiple data sets, which I could then compare to find similarities and differences for analysis. The fact that this comprehensive set of data was managed and discussed in dialogue with a group of several researchers reinforced the relevance and reliability of the data.

However, since a multi-sited approach – by definition – has multiple sites, it can prevent researchers from getting to know any one site in depth. If a researcher does not get to know a site in depth, the quality of the data from that site may not be as high as the researcher hopes. Managing access to multiple sites can also be a challenge and can limit the feasibility of the research. Furthermore, although the use of a multi-sited approach allows a research topic to be explored through multiple spaces, there are almost an endless number of spaces to choose from, as spaces can be geographic, social or virtual. This can potentially limit the research, because the researcher may lack a clear direction (Marcus 1995).

Despite these possible limitations to a multi-sited approach, I feel that the use of multiple sites and multiple methods of data gathering provided me with valuable and comprehensive insights into the matters of concern. Since household energy consumption is based on actor-networks that operate across different social and geographical sites, I found it necessary to obtain information that grasped this interaction and informed my analysis of these issues as a whole. In order to understand how policymakers, experts/economists and household consumers influenced household energy consumption and energy efficiency, it was fruitful for me to combine a set of methods and data material. Also, my main data, which consisted of focus groups and expert interviews, definitely provided this thesis with in-depth information about household energy consumption, the electricity market and energy efficiency.

However, the dynamics and possibilities for change in household energy consumption and energy efficiency led to certain challenges in this research. It is difficult to predict future household energy consumption, especially since this matter depends on diverse technological, social, scientific, economic and political factors. How do we determine the direction in which household energy consumption is heading? Obviously, there is a (methodical) risk that people may choose to give the "correct" answers to questions concerning energy consumption and energy efficiency when they are asked about these matters (particularly when participating in a survey), and these answers may not necessarily correspond to their actual energy behavior. Still, I would argue that the holistic approach of this study, combining a range of spaces and methods and thus involving the perspectives of various actors in the network of household energy consumption, supports the validity of this thesis. After all, we need to listen to the people involved (and give them the benefit of the doubt).

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Consumers as Professional and Political Constructions. On the Performativity of Energy Economics

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Abstract

The paper discusses the theory of performativity, which is the idea that economic theory shapes economic action to resemble the original theoretical assumptions, by examining the way in which Norwegian policy-makers domesticated economic theory when dealing with official policy for the efficient use of energy in households. We examine government white papers and their corresponding parliamentary debates and legal documents to determine the way in which Norwegian households were conceptualized in relation to the market behavior anticipated by economic theory. We observe how the construction of energy users changed over the course of three particular phases of Norwegian energy efficiency policy and how the various constructions elicited different controversies among policy-makers, and conclude that Norwegian energy policy-makers formed ambiguous, vague and shifting constructions of consumers and their anticipated market behavior. We suggest that the ineffectiveness of energy efficiency measures was, to some extent, caused by these shifting constructions.

Keywords: *energy conservation, consumer construction, governmentality, market deregulation, domestication, performativity*

Introduction

Amidst recent efforts to develop a sociology of markets, one promising approach pioneered by Michel Callon (Callon, 1998, 2007; Calıskan & Callon, 2009, 2010) emphasizes the role of economics and economists in the construction of markets. Central to this approach is the assumption that economics is performative in the sense that it shapes economic actions in the image of economic theory. The idea

that economics is performative has been criticized for making untenable assumptions about economic behavior (Miller, 2002) and for overstating the actual influence exercized on economic actions (Mirowski & Nik-Khah, 2008; Santos & Rodrigues, 2009). Nevertheless, Callon presents some new perspectives that deserve further discussion.

In this paper, we explore the economic sociology of Callon and his performativity thesis in a new context. Previous research on the performativity of economics has largely focused on financial or other markets in which professionals dominate the supply and the demand (MacKenzie, 2006; Muniesa, Millo, & Callon, 2007). In these settings, economic models are introduced and used by market actors largely at their own discretion. However, many types of markets are constructed through legal means by political bodies. Markets for energy and, in particular, electricity are interesting examples, not least because, over the past couple of decades, these markets have been deregulated through economists' efforts towards a more liberalized design (see, for example, Bye & Hope, 2005). Still, it is the role of parliament to decide whether to implement such designs. If the performativity thesis is to hold, then debates and policy-making with respect to politically constructed markets must reflect economic theory, or, at least, policy-makers' belief in economic theory. To what extent is this true?

We engaged with these issues by examining one of the purported goals of market deregulation for electricity, namely a more efficient use of electricity in households. We did this by analyzing parliamentary debates in Norway over energy efficiency measures directed at households between 1975 and 2008. During this period, many changes in policy measures took place; among the more important of these changes was a liberalisation of the electricity market in 1990. The relatively long time-period under study and the radical policy shifts that took place during that period provided a suitable context for an exploration of how economics performs on policy-makers.

The Norwegian Parliament's engagement with energy efficiency/energy conservation started in the mid-1970s, in the wake of the so-called 'oil crisis' of

1973. An increasing concern over the future supply of energy led to the introduction of a particular Norwegian conceptualization of energy efficiency policy-making, *energiøkonomisering* (usually referred to through its acronym ENØK), which literally translates into 'energy economisation'. The term was meant to combine concerns related to energy conservation with a preoccupation with the economic efficiency of the energy sector. Arguably, this amalgam of policy concerns emanated from Norway's situation as a country rich in energy resources and economically dependent on a high level of energy production. To emphasize the particularity of this aspect, we use the Norwegian acronym ENØK here, rather than the fairly general English translation, to denote this fairly specific set of policies (see also Ryghaug & Sørensen, 2008).

The political debates over ENØK and the resulting policies came as a response to several white papers presented to the Parliament in the period, which put forth shifting suggestions of instruments that should be applied to support ENØK goals. Over time, economic instruments were emphasized over institutional and technological tools (Sørensen, 2007), and this suggests that economic theory played an important role in the formulation of ENØK policy. In 1990, the Norwegian Parliament passed a new Energy Act that was intended to transform the Norwegian electricity trade from a government-controlled to a deregulated market. This Act was also discussed as part of ENØK policies, but it represented a much more outspoken application of economic theory than seen previously (Bye & Hope, 2005). In the past five to six years, we have observed yet another change through the renewed interest in environmental issues and, in particular, human-made global warming. This has resulted in a resurgence of engagement with energy efficiency and efforts to stimulate a shift towards so-called climate neutral energy sources, reflecting environmental concerns at least as much as economic ones.

The analysis in this paper is focused on households, or, rather, on the way in which household energy consumers were constructed by policy-makers in official policy documents, and how these constructions and the related policies were influenced by economic theory. As suggested above, we identified three

main shifts in the constructions, each related to a particular time period. The first occurred in the wake of the international oil crisis of 1973, when ENØK was introduced as a goal of Norwegian energy policy. Through several government white papers and the related parliamentary discussions in the wake of the crisis, the ENØK perspective was developed (Sørensen, 2007). The second shift occurred at the end of the 1980s, with the proposal of a new Energy Act with the aim of deregulating the electricity trade. The third change came with a crisis in the supply of electricity that occurred during the winter of 2002/2003. Could Callon's idea of the performativity of economics help us to understand these changes?

The next section introduces our theoretical approach. We then move on to the empirical analysis, which was based on a survey of pertinent Norwegian policy documents from the period 1975–2007. These documents include all relevant government white papers and minutes from the debates of these white papers in Parliament. All quotes from these documents that are used in this paper were translated into English by the authors.

On economisation and the performativity of economics

Economic sociology analyzes markets in terms of networks, institutions or performances (Fligstein & Dauter, 2007; Fourcade, 2007). Here, we pursue the latter idea, that markets are made or constructed through the performances of a variety of involved actors. From this perspective, a market is not a natural, autonomous mechanism that balances supply and demand through prices. Rather, markets are made through the efforts of economic, legal and other experts, as well as a diversity of sociotechnical devices that facilitate the calculations that underpin market actions (Callon, 1998; Callon & Muniesa, 2005; MacKenzie, Muniesa, & Siu, 2007).

Thus, a main point is that markets are affected by advice, proposals, analysis and comments from experts, policy-makers, journalists, etc. Another important observation is that actual market behavior cannot be taken for granted. The

textbook image of suppliers instinctively maximizing profits while consumers maximize utility is a misleading simplification. Suppliers and consumers must be shaped and disciplined from particular constructions to make a market 'work'. This requires ideas of what suppliers and consumers in a given market context are supposed to think and do; these ideas, in turn, can shape the legal framework, the incentive systems and the interpretative resources involved. Market actors do not come ready-made out of textbooks, but must be formatted as calculative agents (Callon, Millo, & Muniesa, 2007; MacKenzie et al., 2007).

In textbook neo-classical economic theory, consumers are assumed to be *homo economicus,* making rational economic decisions to optimize their utility, based on perfect information about goods, prices and needs. Usually, social scientists consider this representation of human behavior far too simplistic, but Callon argues in the opposite. Callon suggests that a *homo economicus* is simple because he/she 'is formatted, framed and equipped with prostheses which help him in his calculations and which are, for the most part, produced by economics' (Callon, 1998:51). Consequently, Callon believes that consumers are configured to act according to economic theory through the designs of economists. This is the strong version of the performativity thesis – that economic theory is enacted not because it provides a correct description of human behavior, but because markets are engineered to make people behave according to economic theory.

Donald MacKenzie (2006) proposes a classification of the performativity of economics that presents the modified view that the performativity of economics may vary and be less strong than what Callon proposes. Other scholars are more critical. Miller (2002) argues that the performativity thesis in the strong form is untenable, because it is based on assumptions about human behavior that are empirically incorrect. Consumers do not act according to economic theory, even if markets are designed to make them do so. Santos and Rodrigues (2009) add to this criticism that one of the main cases used to argue for the strong performativity thesis – the spectrum auctions launched in 1994 by the US Federal Communications Commission – has been misinterpreted.

We were more concerned that, largely, the performativity literature leaves the role of governments in the construction of markets unexplored, though this role may be substantial. For example, the construction of a liberalized market for electricity in Norway was at least formally decided by the Parliament, and the decisions involved a lot of legal issues that needed to be in place in order for the designs of the economists to be implemented (Bye & Hope, 2005; Hope, 2000, 2006). We were particularly interested in two aspects of this situation. First, to what degree could we observe that economics performed on or influenced policy-makers (for example through the kind of arguments they used)? Also, were policy-makers aware that they were implementing designs made by economists, and thus potentially made economics performative? Second, to what extent did policy-makers engage in disciplining the population to make them behave as *homo economicus*?

We explored the first issue from a domestication perspective, looking at the argumentative practice and the meaning attributed to economics (Sørensen, Aune, & Hatling, 2000). Domestication is the process wherein specific understandings or practices inscribed in technologies or policies are internalized. If economics was to have led policy-makers to implement the designs of economists, this means they must have domesticated economics in a fairly straightforward and conformist manner. In other words, policy-makers would have had to show that they understood, or at least acted according to, economists' advice. Moreover, we would expect the domestication of economics in situations where economics is supposed to be performative (in Callon's sense) to result in accepting and positive attitudes. A critical interpretation of economics would, on the other hand, suggest scepticism towards economic theory and the advice of economists.

The second issue was pursued as an instance of what Foucault calls 'governmentality' (Dean, 1999). From this perspective, the autonomous subjects of modern societies are assumed to be self-governed, but also objects of disciplining power. Briefly, Foucault's general argument is that the development of modern societies depends on a shift from direct control of behavior,

underpinned by physical punishment, to an indirect disciplining of citizens through the internalization of fairly strict perceptions of 'normal' behavior. Perceptions of normality are shaped and upheld by the establishment of a series of institutions in which 'non-normal' persons are confined – prisons, mental hospitals, general hospitals, etc. (Foucault, 1977). Also, with respect to markets, the idea of normal behavior is encouraged through the continuous replay of public interpretations of the *homo economicus* ideal. Consumers acting in a market are not objects of direct command and control. They are supposed to know how to act the role of disciplined, normal, self-governed individuals buying goods, and they are frequently reminded of this role by newspapers, advertisements, etc. However, as noted above, in Callon's perspective, consumers are also formatted by all the available market devices that make them into the particular form of calculating agents symbolized by the concept of *homo economicus*.

The dominance of cases related to finance in the new economic sociology may have led Callon to overlook the actual challenges of making consumers behave as *homo economicus*, at least outside of cases in which the government engages in activities that may produce an appropriate governmentality. Daniel Fridman (2010) offers an interesting study of how the last military dictatorship in Argentina (1976–83) used consumer campaigns and the financial press to make the population act according the *homo economicus* ideal. While the success in achieving this goal was ambiguous, the efforts were strong and outspoken. Thus, disciplining the population to create economic humans is not necessarily an easy task.

Governmentality with respect to the consumption of electricity, with the added aim of achieving efficient use, may offer particular challenges. In principle, the aims may be achieved by rendering some forms of behavior more rational or moral than others through information campaigns and other forms of political discourse. Incentives, be they economic or social, represent another strategy of governmentality. In this paper, we are concerned with the way in which energy policy-makers constructed household consumers through policy discourse on

energy, electricity, supply and demand. To what extent did these constructions and the related policies reflect economic theory? Could we observe the production of governmentality to support market-based, economic theory driven policy goals? Both issues are indicative of the performativity of economics in the space of policy-making. Not the least, such performativity should be observable in the way households and household energy (particularly electricity) consumption was made sense of and made to shape a particular governmentality of public rationalities and moralities. How did policy-makers construct the rationalities and moralities that were supposed to make people into economically rational consumers and moral citizens who act according to current energy policies? We studied the arguments of policy-makers to identify the rationalities and moralities they produced through their discourse. However, we did not study the actual effects on consumers.

The making of energy-conscious consumers: Economic rationality and moral deficits

What construction of energy/electricity consumers emerged alongside the focus on energy efficiency policies after the so-called 'oil crisis' and the development of the ENØK concept? In the first period studied, from around 1975 to 1989, the electricity market was still regulated. Thus, the initial issue was whether regulations could be improved.

A governmental commission was appointed to inquire into energy use policies, led by a prominent economist, Professor Einar Hope.[13] The commission's proposals reflect an emphasis on thinking about energy in economic terms and a concern with making energy use economically efficient. More concretely, the commission recommended an increase in the price of electricity to curb demand (in this period the price was decided by Parliament), as well as information campaigns, economic support for the insulation of new buildings and stricter

[13] NOU 1975:49 Om tiltak for energiøkonomisering.

building codes. Norwegian citizens were stimulated to reflect on their energy consumption in economic terms:

> It should be emphasized to show what may be achieved by modest efforts without substantial reduction of comfort, but one should also aim to demonstrate the cost of comfort, in order to give the public the best possible basis for considerations.[14]

Consumers were thought to need education about cheap energy savings, as well as the costly aspect of comfort, in order to make the right choices. According to the commission, households ought to be formatted as *homo economicus* with respect to energy consumption.

However, when the report was transformed into a government white paper, only 1 of the 72 pages of the document discussed the individual household consumer.[15] The rest of the report focused on the effects of price changes on industrial and commercial actors. In the proposition from the Parliament's Industry Committee, none of the 19 proposed measures targeted household consumers. In contrast, a focus on large-scale consumers was explained in the parliamentary debate by MP Reidar Due (the Centre Party):

> [W]e prioritize the following areas: Utilization of waste heat, industrial processes, the construction and housing sector, the transport sector, recycling and re-use of energy demanding products (…). The different measures of ENØK taken up for discussion in the proposition must be seen in relation to the competitive situation for our industry and commerce.[16]

Labour's Minister of Industry Bjartmar Gjerde summarized why industry and economic development were the important concerns:

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[14] NOU 1975:49, p. 62.
[15] St. meld. no. 42 (1978–79) Om energiøkonomisering.
[16] Forhandlinger i Stortinget no. 187, 1979:2883–2984.

> A significant portion of the potential for energy conservation comes from the energy-intensive industry (…). The price of electricity to energy-industry is in the eyes of the government in an exceptional position. It would be unjustifiable to set electricity prices without considering the consequences for industry profitability (…). In this context the energy policy must be considered as a general policy instrument and not an overarching goal. Energy policy plays a particularly important role for industrial production and employment.[17]

Mainly, this discourse reflects the long-term emphasis on energy as a prime precondition of economic and industrial development that had dominated Norwegian energy and industrial policy since the beginning of the 20th century. Thus, household consumers were expected to adapt to policies made to serve industry. When they were mentioned, consumers were constructed as drawing on several models. As expected, several MPs referred to *homo economicus* type of properties. However, in their statements, they emphasized a limited aspect of this consumer role, mainly articulating a clear belief that people would react to regular price incentives by changing their behavior when a clear price signal to do so was imparted. If prices were increased, the expected reaction was reduced consumption. Reidar Due of the Centre Party stated that this was the common point of view:

> A united [Industry] committee states that it considers the question of electricity prices to be decisive for the efficiency of ENØK. This relates to electricity to industry as well as to regular consumption.[18]

Labour Party MP Tom Thoresen emphasized that:

[17] Forhandlinger i Stortinget no. 187, 1979:2899–2900.
[18] Forhandlinger i Stortinget no. 187, 1979:2883.

> Personally, I believe prices as a tool will give conservation effects without negative side effects. We know from our own households that there is something to be gained from using electricity more sparingly.[19]

This focus on the price mechanism was reflected across the political spectrum. Hanna Kvanmo of the Socialist Left Party also agreed that 'Prices will also dampen any tendencies to waste electricity in most homes'.[20] These MPs constructed consumers as economically rational, but only in a particular manner. While economic theory sees consumers as agents who optimize their utility (and therefore do not necessarily act on the price margin, but according to their own utility function), the MPs did not. To them, the only rational reaction to a price hike was reduced consumption.

Most likely, this misunderstanding of economic theory was due to the circumstances under which the MPs domesticated the theory. Through ENØK policies, they expected to achieve two rather different goals, namely energy saving and economic, efficient use. Moreover, in the final instance, the MPs remained uncertain over whether consumers would actually be disciplined through price signals. Several hinted that consumers were morally deficient in order to explain the difficulties in disciplining them by economic instruments, only. It was believed that, in a better world, consumers would save energy without being made into objects of governmentality strategies based on increased prices. However, the flesh was considered weak, and several MPs questioned people's willingness to take on a moral responsibility for conserving energy because they were believed to be accustomed to comfort. This point of view was eloquently expressed by Christian Democrat Odd Vigestad:

> Use of electric heating and oil stoves provides the temperature we feel comfortable with all day long. We do not have to do dishes by hand, we have 10–12 sources of light in our living rooms (…) we

[19] Forhandlinger i Stortinget no. 187, 1979:2889.
[20] Forhandlinger i Stortinget no. 187, 1979:2893.

> have color TVs, we do not have to dry our clothes outside, we do not have to mind the weather (…). [P]eople's attitude to energy consumption must change (…). I think that a kind of information campaign must be constructed so that the individual feels shame over wasting energy, and sees it as a moral commitment to conserve energy.[21]

Kjell Helland, Labour Party MP, joined in:

> No one can honestly say that they do not waste energy (…). Much of the increase in energy consumption is in my opinion due to short-term thinking, but also our need for comfort (…). Many of us are very leisurely minded.[22]

Many of the MPs seem to have been generally convinced that it would be difficult to make household consumers save energy. Here is Odd Vigestad again: 'I want to make clear that it will not be an easy task to guide the Norwegian people onto the energy conservation track'.[23] Sverre Helland, MP of the Centre Party, emphasized in the debate that 'It is in my opinion pretty clear that factors of mass psychology have a strong influence on energy consumption',[24] indicating disbelief in the economic rationality of households' energy consumption. The obvious conclusion was drawn by MP of the Conservative Party Carl Fr. Lowzow, who stated that 'Through systematic work and social planning [we can] make use of research to train people to consume less energy and avoid waste'.[25] As can be seen, many MPs acknowledged that it would take a lot of work to provide the governmentality needed to make consumers understand that they should save energy when prices were higher. Thus, they seemed sceptical of the simplified version of economic theory that they put forward in the debates – above all, the

[21] Forhandlinger i Stortinget no. 187, 1979:2889–2890.
[22] Forhandlinger i Stortinget no. 187, 1979:2905.
[23] Forhandlinger i Stortinget no. 187, 1979:2890.
[24] Forhandlinger i Stortinget no. 187, 1979:2900.
[25] Forhandlinger i Stortinget no. 187, 1979:2913–2914.

(theoretically dubious) idea that increasing prices would unambiguously reduce demand.

In this manner, it was not assumed that consumers would enact the role of the conscientious and price-sensitive energy saver. Rather, it was expected that, to act according to policy-makers' goals and their version of economic theory, customers would need to become better informed and educated. Throughout the ENØK debate, MPs returned to the notion that one of the central shortcomings of the system was the lack of information and knowledge of energy conservation among consumers. Reidar Due stated that 'The Ministry [of Energy and Petroleum] indicates that in order to get conservation among consumers, active participation from the populace is needed; and in order to succeed, more information and training is in order'.[26] Johannes Vågsnes of the Christian Democrats took this point even further: 'I want to underscore the fact that training in resource management and consumption must have a more central place in our whole educational system'.[27] From this perspective, it was thought necessary for schools to install energy saving governmentality, since this was seen as difficult to achieve. Clearly, Norwegian policy-makers were less optimistic than Callon about the performativity of economics and the impact of various calculation devices.

To summarize, the baseline construction of household electricity consumers in this period did not accord with the *homo economicus* model, which would have shown consumers to make rational decisions based on reflections on the relationship between prices and utility. Rather, consumers were expected to (ideally) be price-sensitive energy savers. However, as we have seen in the parliamentary debate, actual consumers were constructed as having two important shortfalls: a knowledge deficit and a moral deficit. To overcome these deficits, consumers were thought to need education to meet policy-makers' expectations. Until these deficits could be done away with, paternalistic

[26] Forhandlinger i Stortinget no. 187, 1979:2882.
[27] Forhandlinger i Stortinget no. 187, 1979:2898.

politicians thought that household consumers would need to be cared for with access to sufficient amounts of energy at reasonable prices.

Seemingly, economic theory did not perform effectively on policy-makers. They did not domesticate the theory in a professionally correct way, nor did the MPs in this period unambiguously provide for a governmentality centred on *homo economicus.* Rather, the two deficits among the public observed in the debates suggest ambivalence towards economic theory. On the one hand, information and knowledge about options and outcomes are necessary for economically rational action. Correction of such deficits facilitates the enactment of economic rationality and thus formats the population in the image of *homo economicus*. On the other hand, the moral deficit emphasized by several MPs refers to a distinctly different kind of rationality, concerned with virtues and vices. It is virtuous to be careful in the use of energy – to economize in order to save – while it is a vice to crave comfort.[28] Enacting *homo economicus* would not be helpful with respect to this kind of deficit. Thus, we believe that the construction of the household consumers found in the parliamentary debates in this period was torn between price-centred rationality and the virtuousness of being thrifty. On this basis, it was difficult to provide for an effective governmentality.

As already noted, throughout this period, household customers were seen as less relevant to ENØK than were industry. Thus, policy-making with respect to household energy consumption was considered less important. Perhaps the ambiguous construction of household consumers made a focus on industrial and commercial actors, who were assumed to respond more 'correctly' to economic incentives, seem more rewarding. However, in the longer run, it turned out to be difficult to neglect household consumers because their share of electricity consumption was large and growing. Moreover, the introduction of a liberalized market for electricity in Norway in 1990 signalled that policy-makers chose a different approach to ENØK than the approach agreed upon in the previous

[28] This type of morality stands in opposition to the inherent morality of markets discussed by Fourcade and Healy (2007), which emphasizes that good morals lead to economically rational behavior: a market society is also a good society.

period. Did this pave the way for a construction of household consumers as more singularly economically rational, thus making economic theory more performative? Was the focus on virtue lost at the beginning of the 1990s?

Construction controversies: Economic rationality meets political care

When the Norwegian Parliament passed a new Energy Act in 1990, thus creating a liberalized market for electricity, they introduced an explicit economic design. Hope (2000) claims that the groundwork for the market reform was laid by a group of economists working at the Norwegian School of Economics and Business Administration (NHH) in the early 1970s. According to Hope, they started with a pure thought experiment to consider what a deregulated market-based system of electricity trade might look like. Consequently, they tried to solidify the arguments in some internal reports, fleshing out ideas and setting up the necessary rules and basic structure of such a market. Hope further claims that these reports were picked up by the central administration, who later turned to this research group for assistance in setting up the 'rules of the game' for market reform of the electricity sector. Thus, there was a clearly intended performativity in the design. How did the design and the underlying economic theory influence policy-makers?

A commission appointed by the social democrats in the early 1980s to propose changes in legal regulations for electricity trading was more concerned with organizational issues, such as merging electricity producers into larger units. The commission also proposed a vertical integration of production and distribution, believing that this would result in substantial increases in efficiency:

> The aim of managing the power system is to minimize the social-economic costs of all Norwegian supply of energy that may be covered by the electrical power system (…). With fewer and more resourceful units of power production it will be possible to bring

> into action more resources to strengthen the supply network and use of modern control equipment to achieve better utilization of the plants of production and transmission.[29]

The main aim was to achieve greater economic efficiency in the Norwegian energy system. In this respect, the commission represented a change in the official energy policy orientated towards less concern with industrial development and employment and more emphasis on economic results. The reform proposed by this commission was not taken into law, however, and a new commission that sprang out from the new Centre-Right coalition of 1989 proposed a new, more market-orientated reform.

This shift in emphasis in ENØK policies is even more clear in the white paper proposing the new Act. In the paper, energy conservation concerns are placed backstage, and arguments supporting legislative reform mainly promise increased economic efficiency of the electricity system:

> The present system for trade of commissioned power is not very flexible and thus unsatisfactory with respect to the needs created by varying supply and demand and possibilities for economically optimal use of energy, etc. This is above all due to a distinction between commissioned power and occasional power and some institutional constraints. Therefore, an adaption of legal rules is needed to facilitate a more market-based trade in electrical power, which may give considerable social-economic gains.[30]

Neither the commission's report nor the white paper engaged much in any explicit construction of household consumers or reflected on the need for action that could bring about a *homo economicus* or virtuous saver mentality. Of course, there was an underlying idea that consumers would appreciate increased

[29] NOU 1985: 9. Energilovgivningen, p. 8.
[30] Ot. prp. no. 73 (1988–89) Om energilovgivningen, p. 1.

economic efficiency of the energy system, and that this would potentially lead to lower prices. However, the energy conservation concerns of the previous period were more or less overlooked. Official documents reveal little of how the consumers were thought to be constituted within the new regime, with the exception of an admission on behalf of household consumers: 'With the proposed law it might be viable for large customers to buy power from other suppliers. For households this will probably not be a realistic alternative'.[31] The parliamentary proposition only gave cursory mention to consumers' role in the larger energy policy context, and was especially silent on consumers' role in ENØK for energy conservation. It was simply emphasized that they had a role: 'Planning and execution of concrete measures must on the other hand be the responsibility of the customers'.[32]

It is difficult to draw conclusions from the proposition text, only, but the new Act truly signified a transition from one conceptual system to another (Thue, 1996). This became evident in the parliamentary debate over the proposition. A large minority, comprised of MPs from the Labour Party and the Socialist Left Party, still saw consumers as part of a larger regulatory structure in need of particular attention. Several MPs from the Labour Party mentioned that the main goal of a new Energy Act should be to attend to consumers' needs. These needs were thought to relate, above all, to access to a secure supply of electricity and low prices. For example, Labour MP Ernst Wroldsen commented that 'It is customers – especially in rural areas – who will suffer if we cannot obtain reasonable mergers [of electricity producers]'.[33]

There were also worries that the reform would harm an unprepared constituency. For example, Labour MP Astrid Marie Nistad stated that '[W]hat I am concerned about is (…) whether consumers of electricity have had the time they need to understand the scope (…) of these changes'.[34] Otto Engen, also MP for Labour, argued that '[T]he most damaging consequences of the law must be

[31] Innstilling til Odelstinget no. 67 (1989–90), p. 29.
[32] Ot. prp. no. 43 (1989–90), p. 21.
[33] Forhandlinger i Odelstinget no. 25 1990:363.
[34] Forhandlinger i Odelstinget no. 26 1990:378.

averted. Only in this way can the interests of the customers be safeguarded in a satisfying way'.[35] These quotes show how the Labour Party, to some extent, remained in a paternalist mode, though with a different emphasis than exhibited in the first debates over ENØK. In the later debates, the most important aim was securing a low price of electricity for household customers through government price control. If there were environmental reasons for price hikes, the Labour Party and the Socialist Left Party suggested that these should happen 'through the use of particularly designed environmental taxes'.[36] The paradoxical construction of the consumers that we observed in the previous section had become less outspoken, probably because conservation issues were seen as less important. The moral emphasis upon thriftiness had dwindled.

What about the performativity of the economic design? The arguments employed by the Labour MPs indicate that they had limited belief that the market devices of the new law would actually work – at least not without some political intervention to help household consumers adapt to a deregulated market. The domestication of economic theory among these MPs does not appear to have resulted in a 'correct' understanding. Rather, the domestication seems to have been shaped by an inquiring, if not outright critical, mode, with respect to the abilities of households to cope with deregulation. What, then, about the ruling government coalition, consisting of the liberalist Conservative Party, the Christian Democrats and the Centre Party? The MPs from this block said very little about the role of the consumers. Their focus was mainly on the general societal benefits to be gained from a more economically efficient organisation of the production and distribution of electricity that would presumably be achieved through deregulation. In particular, the possibility of more flexible pricing of electricity for export was expected to generate larger incomes for electricity companies. Previously, they had been forced to export at the local price, which was significantly lower than the price of electricity in neighbouring countries. With the new Act, export prices would rise substantially.

[35] Forhandlinger i Odelstinget no. 27 1990:392.
[36] Innstilling til Odelstinget no. 67 1989–90:13.

The attitude of MPs in the majority block reflected the proposition of the Ministry of Petroleum and Energy, which highlighted four main reasons for changing the existing energy law:

1. The electricity market has in the course of the last years changed from a situation with rapid growth in demand and attention to new developments to a situation with rather large trade of electricity at low prices.
2. The demands for efficiency in the production and yield on investments in Norwegian economy have gained more attention.
3. There has been a change in the attitude to society's governance, resulting in a more positive view of deregulation and competition.
4. There is increased interest in market based trade in electricity.[37]

The proposition mentions consumers within the main goal statement: 'The goals are still to ensure an economically rational utilisation of energy resources, arrange for a secure energy supply, and equalize prices to consumers'.[38] However, it expresses a fairly shallow construction of household consumers as mainly needing equality with respect to prices. In the parliamentary debate, the Centre-Right coalition only discussed household consumers when challenged by the opposition, and only then in terms of the price effect of the proposed reform. Consider the following response from a Christian Democrat MP, Helga Haugen, to a representative from the Labour Party, regarding the price effect of the law reform:

> The Labour Party posits that the price of electricity to consumers will increase with the Government's proposal (…). The majority of

[37] Innstilling til Odelstinget no. 67 1989–90:1.
[38] Innstilling til Odelstinget no. 67 1989–90:1–2.

> the committee is of the opinion that a more rational and efficient organisational structure and market based electricity trade will stimulate a better and more flexible utilisation of the energy resources as well as equalize electricity prices.[39]

This quote hints at a construction of consumers that draws on the *homo economicus* idea. Petter Bjørheim, MP from the supporting far-right Progress Party, provided a more explicit outline of these assumptions:

> It is given that the possibility to gain insight into the industry exists, so that the customer – the consumer – may see how the price is calculated (…). [It] is clear that when this law is thoroughly incorporated, the market itself will set the price – not politicians or this house – it is simply a question of buyer and seller (…). [I]n a market oriented system with full openness, any bad investments will be revealed. It will be possible for the consumers to see those producers who do a good job and those who do not.[40]

We may recognize this construction as a typical neo-liberal understanding of market formation as the guiding principle for policy: consumers are expected to stay updated on price fluctuations and negotiate contracts and prices with suppliers accordingly; suppliers, on the other hand, should take care to invest wisely, lest they be punished by the market.

The only person from the Centre-Right coalition that expressed a similarly clear view was the Minister for Petroleum and Energy, Eivind Reiten of the Centre Party:

> Consumers get a larger opportunity to choose with the proposed law – indirectly through a more encompassing wholesale market,

[39] Forhandlinger i Odelstinget no. 26 1989–90:373.
[40] Forhandlinger i Odelstinget no. 26 1989–90:366–367.

> directly with the loosening of the compulsory delivery of electricity (…). Our proposal means more independent actors and real freedom for consumers to negotiate prices, delivery conditions, instead of having to pay the bill that the monopolies send them at the end of each year.[41]

The latter two quotes suggest that MPs belonging to the majority coalition domesticated economic theory less ambiguously and more correctly than did those in the parliamentary minority. We observed a fairly strong belief that new calculation devices would bring about greater transparency of the system as well as stronger engagement of consumers in negotiating prices and conditions of delivery. The lack of reservation also indicates a fairly strong belief in the performativity of the new market devices to make consumers act according to the intentions. Thus, majority policy-makers did not argue any need for supporting governmentality measures.

The parliamentary debate in 1979, discussed in the previous section, provided ample evidence of deep ambiguities in the construction of household consumers. Consumers were, on the one hand, seen as economically rational, in the sense that they were expected to reduce consumption when prices went up; on the other hand, they were thought to have definite moral and knowledge deficits that hampered energy efficiency measures. In this sense, household consumers both were and were not thought to need of political care. Policy-makers seemed to doubt whether measures based on economic theory designs would be sufficient to reach energy efficiency goals. To secure adequate behavior, consumers were thought to need information and education. Consequently, according to policy-makers at that time, governmentality measures were needed.

The discussion leading to the new Energy Act demonstrates a shift in these attitudes. By the second period, a majority had come to see consumers as competent economic actors according to the standards of economic theory.

[41] Forhandlinger i Odelstinget no. 26 1989–90:385, 387.

While Labour Party MPs remained worried about this competence, the ruling coalition seemed to assume that a liberalized market and its various calculation devices would discipline consumers to act as predicted by textbook economic theory. It was this new, unambiguous construction of consumers in the image of *homo economicus* that facilitated the decision to liberalize trade in electricity. When the moral issues previously produced by energy conservation concerns were able to be set aside, household consumers were able to be constructed in a simpler way. Also, the MPs of the Labour Party and the Socialist Left Party produced a less ambivalent construction of consumers than in the previous period. In the second period, they saw consumers as mainly needing electricity in sufficient quantities at a reasonable price. However, consumers were not thought to need to enact the role of *homo economicus*, since it could be too demanding and painful for them to behave in this manner. In addition, this group of politicians also set aside the moral issues of energy conservation and, consequently, the importance of virtue that was forcefully argued in the previous decade.

Thus, the shared but ambiguous and contradictory construction of the household consumer in the first period was, in the second period, replaced with a controversy over two competing but simpler constructions reflecting two modes of domestication of economic theory. From the parliamentary debate, it seems that the majority of MPs had appropriated the theory and accepted it, while the minority had not. However, neither side proposed measures to produce governmentality to effectuate either 'correct' market behavior or virtuous energy saving. Most likely, the debate in the second period and the decision to deregulate the electricity market marked a shift in the interpretation of energy. The debate showed an understanding of energy as a predominantly economic good that should be used to achieve economic benefits for society. Perhaps ironically, this reflects a dominance of thinking about energy in purely economic terms. The focus on energy conservation and energy efficiency issues of the first period had disappeared. The ENØK concept was still around, but it had come to signify economisation in the sense proposed by Çaliskan and Callon (2009, 2010), namely that the production and use of energy is understood in economic

terms. While we cannot conclude that the policy shift from the first to the second period unambiguously signifies a breakthrough with respect to the performativity of economics, the proposal of Callon at least became more viable. However, the more singular focus on economic issues in the later energy policy debate could also reflect the relative disappearance of environmental concerns and energy efficiency ambitions. We now explore this issue with respect to the third period studied – a period in which environmental concerns over energy regained prominence.

Insufficient performances?

As we have seen, the passage of the new Energy Act saw a change from political agreement to political controversy in Norwegian energy policy. Seemingly, this reform heralded the end of an era wherein increased supply of electricity was a shared political goal embedded in a common idea of how to pursue modernity and progress (Thue, 1996). Through the new Act, electricity was made into an object of supply and demand, rather than political decision-making. However, as indicated above, the resolution made by the Norwegian Parliament was founded on a paradoxical goal. On the one hand, the new Act was supposed to improve economic efficiency in electricity supply, leading to a reduction of prices. On the other hand, the Act was meant to provide a disciplinary mechanism – the market – that would make household consumers behave according to an economic rationality; this economic rationality was thought to encourage them to use electricity in a more optimal manner and thus induce them to spend less.

However, during the 1990s, there was little concern over this inconsistency. A new white paper on ENØK confirmed the government's belief in economic rationality as the pillar of energy policy. However, there was a growing concern about the need for a supportive governmentality. Energy actors, including individual consumers, were seen to require motivation for making decisions about the production and use of energy that were profitable from a societal point of view. The government aimed to facilitate a procedure wherein suppliers of

energy and ENØK products *on their own* inform about ENØK and market a more efficient use of energy.[42]

In the aftermath of the electricity supply crisis in the winter of 2002/2003, changes occurred. Due to very dry weather, the Norwegian system of hydroelectric power had very low capacity, and electricity prices rose to hitherto unseen levels. The effects were deemed socially unacceptable, and the government advanced a white paper to discuss measures to cope with the situation. Security of supply re-emerged as an issue. The white paper mainly focused on issues related to supply and proposed measures to increase the efficiency of the existing system and support the development of new energy sources. At least to some extent, the market was seen to have failed in providing security of supply. In addition, consumers were no longer constructed as empowered rational actors with the freedom to choose among suppliers. Rather, they appeared as victims of electricity prices that were too high, even if the white paper also proposed some measures to improve consumers' relative position in the market, such as facilitating the change of electricity suppliers and improving the settling of accounts.[43] Actually, the resulting construction of consumers largely appears to have been in line with the construction offered by the Labour Party and the Socialist Left Party MPs in the discussion of the new Energy Act in the previous period. In the third period, household consumers were seen to have the right to buy sufficient electricity at a stable and reasonable price.

When the white paper was discussed in Parliament, the debate confirmed that policy-makers were mainly concerned with supply side measures. The main preoccupation was with increasing electricity production and regaining a reasonable level of supply security. The MPs were not concerned with making consumers use less electricity, but with stimulating the production of more energy. In this respect, there were considerable disagreements, especially regarding electricity production based on the use of natural gas. Also, there were

[42] St. meld. no. 41 (1992–93) Om energiøkonomisering og nye fornybare energikilder. Our emphasis.
[43] St. meld. no. 19 (2003–2004) Om forsyningssikkerheten for strøm m.v.

substantial differences in the appraisal of the energy market's ability to cater for the situation. Ingvild Vaggen Malvik, MP from the Socialist Left Party, voiced a critical attitude to the deregulated market and the Energy Act:

> The Socialist Left Party believes that last year clearly has shown the need to review and revise the Energy Act, not just in relation to security of supply and electricity prices, but also to regain control of the electricity market in order to include environmental concerns in the Energy Act. The Act should be revised to encourage people to choose ENØK and renewable energy. The framework conditions must be developed so that water-borne heat and new renewable energy provide sustainable energy and lucrative jobs. In addition, the Socialist Left Party is convinced that such a holistic energy readjustment will be profitable and contribute to a sustainable energy system in accordance with our international climate obligations.[44]

Malvik proposed the need for instruments that would make household consumers choose ENØK and renewable energy; however, neither she nor any of the participants in the debate forwarded concrete proposals towards this aim. Presumably, she, like many other MPs, was critical of the level of electricity consumption. This was expressed by May Britt Vikhovde of the Liberal Party: 'It is not a worthy environmental policy to use something as high-grade as electrical energy to heat houses, when there are so many simple and good alternatives'.[45] Still, the dominant view was expressed by Labour MP Olav Akselsen:

> The Energy Act is now 14 years [old], and we should be able to conclude that it has had many positive aspects. We have gained a far more efficient [electricity sector], we have achieved a better utilization of production capacity and an improved network, and

[44] Forhandlinger i Stortinget no. 185: 2787.
[45] Forhandlinger i Stortinget no. 185: 2792.

> we have gotten a professionalization of these [electricity producing] companies. Nevertheless, we should also be able to conclude that with respect to one issue, the Energy Act has failed: It has not contributed to develop sufficient new production capacity. One has not been able to secure the amount of energy necessary to be in balance.[46]

Thus, once again, household consumers were not at the centre of attention; rather, the electricity companies were thought to have faulted. They had not provided the necessary level of investment, given the expectation of how a 'free market' should work. Compared to previous policy debates, in this third debate, household consumers were sidestepped, even if there was an implicit understanding that a substantial part of electricity consumption could be replaced by other energy sources. However, the responsibility for achieving such a shift was given to government or energy companies, not to individual consumers. Any effort to install a governmentality to discipline household consumers towards sustainable energy use was not visibly on the policy agenda.

The white paper on the security of electricity supply was brought forward by a Centre-Conservative coalition government. Two years later, in 2006, a Labour Party government advanced a related white paper with the explicit aim of reducing the electricity consumption in households. This placed household consumers at the front stage of energy policy. The aim of this policy document was not to help increase the production of electricity, but to shift the demand to other sources of energy or to induce energy conservation. The white paper proposed measures with respect to three technologies; the government wanted to introduce subsidies to households investing in pellet fireplaces, heat-pumps (with the exception of air-to-air heat-pumps) and control systems for saving electricity. To support this, the government also proposed an information campaign.[47]

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[46] Forhandlinger i Stortinget no. 185: 2798.
[47] St. prp. no. 82 (2005-2006) Tiltak for å begrense elektrisitetsbruken i husholdninger.

The white paper's construction of consumers drew on the ideal of *homo economicus* as representing the kind of rationality that would make subsidies attractive. However, there was no expectation that many consumers would actually engage in behaviors to make their energy use more sustainable. Subsidies were expected to only work on a minority, and, even so, the white paper was concerned that consumers had an information deficit. The subsequent debate in Parliament showed, firstly, a widespread agreement that the consumption of electrical power in households was too high. Conservation of electricity had become an explicit issue. MP and Christian Democrat Line Hjemdal expressed this succinctly: 'In a situation with electricity scarcity it is sensible to get people to save energy'.[48] Ola Borten Moe, MP of the Centre Party (and present Minister of Petroleum and Energy), summarised the understanding of the issues at hand:

> I note that there is a widespread agreement in the House about the realities, linked to the fact that we have over-consumption of electricity for heating, and that most of the parties share the wish to guide it towards other sources of energy to release electricity and in this way introduce new technologies to heat Norwegian households. I am happy with this. I am quite sure that it is decisive that we succeed in realising exactly this shift in the consumption of energy.[49]

Compared to the debates over ENØK in the late 1970s or the later debates over the new Energy Act, in the debates of the third period, the underlying construction of household consumers was shown to have changed once more. It was conceded that consumers might have information deficits, but they were no longer thought to need political safeguarding, nor were they expected to be

[48] Forhandlinger i Stortinget no. 187: 790.
[49] Forhandlinger i Stortinget no. 187: 790.

disciplined in a simple way according to energy prices. Rather, they were assumed to be affected by another type of incentive, as accounted for by then Minister of Petroleum and Energy, Odd Roger Enoksen:

> Many households are engaged with the evaluation of alternative sources of energy that may limit the use of electricity. This is one of the reasons why the Government proposes to introduce measures to assist households in making good and conscious energy choices, and these measures are in the current context a support scheme for households and an information campaign for households and industry. The aim of this support scheme is accordingly to provide households with support when they invest in mature technologies that today are not widely used, and therefore the scheme includes pellet fireplaces, heat-pumps in water-based systems and control systems to save electricity.[50]

Arguably, the idea of a moral deficit re-emerged in the third period, but in a different fashion. Policy-makers noted that there was overconsumption of electricity, and that this was a moral problem, given the fact that shifting to other energy sources was thought to be profitable. However, compared to the construction of consumers made in the late 1970s, the construction in the third period featured fewer complaints about how difficult it would be to accomplish changes and about the lack of motivation for change among household consumers. On the other hand, it was a shift in energy sources, rather than energy conservation, that was put on the agenda. Primarily, people were not expected to save energy so much as to use forms of energy other than electricity. Thus, by the third period, the economisation of energy that dominated the second period had been replaced by a construction of energy that emphasized technological diversity. Economic effectiveness was less of a concern than providing incentives to achieve a shift in the energy sources used by households.

[50] Forhandlinger i Stortinget no. 187: 791.

The electricity supply crisis that occurred in 2002/2003 made it very difficult to blame consumers, given the fact that the utility companies made very large profits. Also, the newspapers carried stories of, for example, elderly people freezing because they were not sure they could pay their electricity bills. Given this, it is unsurprising that policy-makers targeted the supply side and criticized the lack of investments for an increase in supply, which, in theory, should have taken place. Obviously, an effective incentive system and/or governmentality had not been installed in the utility companies to make them act as expected.

However, with the next white paper, from 2005–2006, household consumers were directly targeted, more so than in any of the previous instances. Here, we observed the emergence of a new construction that seems to have been shared by policy-makers across the political spectrum. Household consumers were still constructed as susceptible to economic incentives, but they were seen to be better motivated by investment subsidies than by increases in prices through increased taxes. Presumably, policy-makers had observed, over a long period of time, that the price of electricity was not effective for producing changes in consumption, as they had previously thought. The *homo economicus* construct was not abandoned, but the emphasis was different – consumers were constructed as potential investors in new energy sources or energy efficiency technologies, rather than just consumers of electricity.

Also, the moral issue had changed. In the third period, it was no longer about thriftiness and saving, but about motivation to invest. As we have seen, policy-makers were still concerned about deficits and lack of interest in change, but the tone was nevertheless more optimistic. Thus, the conflict between the emphasis on economic rationality and the moral deficit that was so clearly articulated in the first period had, by the third period, become less outspoken and less problematic. Actually, the shift from a focus on the price of electricity and the virtue of thriftiness to a focus on investment in and motivation for change can be considered a shift from an ambiguous to a more consistent construction of household customers. The white paper of 2005–2006 proposed that a fairly uncontroversial investment-orientated governmentality should be installed in

household consumers. However, the optimism was limited with respect to the effects of the proposed measures, including the extended number of market devices. Seemingly, policy-makers had learnt not to expect strong performativity from the economic designs of the electricity market or from public subsidies. At least to some extent, they had lost faith in economic theory as the single source of effective policy-making.

Conclusion: Reconsidering performativity

Michel Callon (2007) argues a fairly strong thesis of the performativity of economics with respect to the design and functioning of markets, while Donald MacKenzie (2006) suggests a diversity of performativities of varying strength. We set out to explore the performativity thesis by analyzing the way in which Norwegian policy-makers, over a period of more than 30 years, engaged with issues related to the electricity trade and energy conservation. Did economic theory influence policy-makers? Did policy-makers engage in efforts to support the performativity of economic theory and thus provide for a *homo economicus*, as well as an energy saving, governmentality?

This paper has explored these questions by analyzing how policy-makers constructed household consumers of electricity and how the construction process was related to energy policy-making in Norway. The main idea has been that energy policy is, in important ways, shaped by an underlying understanding of consumers. Such constructions may obstruct or facilitate the production of policies for sustainable energy, depending on whether a particular construction of consumers may be accommodated by a particular set of policies. In this paper, we have focused on three instances of such constructions: first, through an analysis of the efforts to formulate a conservation-orientated energy policy in the aftermath of the oil crisis in 1973; second, through a study of the understanding of consumers underlying the passing of the Energy Act of 1990, which produced a liberalized market for electricity; and third, through an exploration of the construction of consumers in a situation wherein policy-makers became

concerned with the security of the electricity supply, as well as sustainability, between 2003 and 2006.

The construction of household consumers changed during the 30-year period we analyzed. In the wake of the oil crisis, we found that household consumers were constructed in an ambiguous and potentially inconsistent way. At the outset, policy-makers believed that household consumers acted according to a simplified (and theoretically dubious) economic rationality, implying that consumers would use less electricity when facing increased prices. Prices were expected to discipline consumers to spend less. However, we also saw that policy-makers emphasized two shortfalls: a knowledge deficit and a moral deficit. The knowledge deficit was used to explain why the simple economic rationality might not work, because consumers were thought to know too little about how to interpret prices and what kind of alternatives were available to save electricity. The assumption of a moral deficit was actually a competing approach, since the arguments implied that consumers would not save electricity even if prices were to increase, because they lacked the virtue of thriftiness. Members of Parliament saw the need for paternalistic measures towards household consumers, placing government in an educational role, but they were reluctant to act on this. In this way, it was difficult to observe that policy-makers domesticated economic theory to allow it to perform on policy-making, or that policy-makers actually believed that economic measures would be sufficient to discipline consumers.

The debate over the new Energy Act in 1989 demonstrates a change in these attitudes. The previous agreement over an ambiguous construction of household consumers had, by then, been replaced by disagreement. The Centre-Right government coalition behind the proposed law clearly constructed consumers in the image of *homo economicus*, or rational economic actors, and expected the new calculation devices to discipline consumers into 'proper' market actors. Thus, the majority of MPs domesticated economic theory in an accepting manner. The opposition, the Labour Party and the Socialist Left Party put forward a construction emphasizing consumers' right to buy electricity at a

'reasonable' price, and thus highlighted that consumers were in need of paternalistic care. The deficits, so important in the previous construction, were basically overlooked by both parties in this debate. Presumably, this is a reflection of the fact that, in this debate, energy conservation concerns were hardly present. Seemingly, this absence paved the way for the Centre-Right coalition's belief that economic theory, through the design of the liberalized market for electricity, could actually be performative.

The electricity supply crisis that emerged in the winter of 2002–2003 revealed weaknesses in the neo-liberal construction; these weaknesses were not so much of consumers, but of suppliers who had failed to make the expected investments in new production. On the one hand, steep price hikes did not produce much of a reduction in energy consumption. On the other hand, capacity on the supply side had hardly increased since 1990, even if consumption had grown. In response, policy-makers began to turn their attention to the utility companies. However, the next step was actually a white paper that explicitly focused on ways in which households might be influenced to reduce their electricity consumption. Here, we observed that the policy disagreement that emerged in the debate over the Energy Act of 1990 had faded. The controversy over whether consumers should be constructed as *homo economicus* or as dependent on political paternalism gave way to a shared construct – the household consumer as an investor in alternative energy sources. Thus, we saw a shift away from the previous focus on price as a disciplining instrument. Instead, information on alternatives was given some priority, but the main measure was an offer of subsidies to households that invested in preferred energy technologies: pellet fireplaces, water-based heat-pump systems and control systems for electricity.

In this manner, the concerns related to what we have described as governmentality measures changed. In the aftermath of the oil crisis, consumers were seen to be potentially disciplined by increased prices, but also resistant to such discipline, due to knowledge and morality deficits. These deficits were thought to make it difficult for consumers to act consistently. When the Energy Act was passed, in the second period studied, the majority of policy-makers

believed consumers to be responsive to price changes and to optimize their consumption accordingly. However, these policy-makers believed that a governmentality based on *homo economicus* was already in place due to new calculation devices. The main measure that consumers were thought to need was the necessary information to make the right choices. On the other hand, a sizeable minority of policy-makers constructed consumers as needing political care, and disbelieved the performativity of the economic theory in the design of the liberalized market, in the sense that it would provide appropriately for household consumers.

The shift in emphasis from the relative prices of electricity to investments in new energy technologies that occurred after the electricity supply crisis (in the third period) led to yet another construction of household consumers. In this period, a clear focus on economic rationality remained in the construction of consumers, but it was differently linked to their potential decision-making. While a shift in relative prices had to be interpreted and, eventually, made into a decision to change heating systems, etc., the investment focus and the offer to subsidise could have been seen to be more directly linked to a new core issue – the technologies that used. Arguably, this shift made the previously observed moral deficit less relevant. The aim was no longer to support thriftiness and reduce comfort, but to change the technological basis of households' comfort.

These findings do not support any strong versions of the performativity of economic theory. While economists played a vital role in the design of the liberalized market for electricity in Norway (Karlstrøm 2012), it was only fleeting that a majority of policy-makers trusted the new calculation devices of a liberalized market to achieve a balance of supply and demand in the way that economic theory assumes. A clear expression of this is the shift in policy focus observed in the final period we analyzed, wherein the focus on the role of electricity prices in influencing consumers' behavior was changed into a policy proposing the subsidy of particular energy technologies for household use. While it is true that economists designed the liberalized electricity markets as well as

the later system of subsidies, policy-makers observed household consumers to respond to the deregulated markets differently than expected.

The critique of the performativity thesis raised by authors such as Miller (2002) seems to be correct in the sense that the thesis makes untenable assumptions about the way people behave. At least, access to the kind of calculation devices offered by liberalized markets must be supplemented by measures that install governmentality – and perhaps also skills – that lead consumers to use these devices in the prescribed manner. In addition, it is important to note that the influence of economic theory on policy-makers may be importantly moderated by at least three features. First, economic theory may be domesticated in a manner that results in misunderstandings and misrepresentations. Second, policy-makers may find the results of policies developed on the basis of economic theory to be inconsistent with theoretical promises. Third, competing political framings – like environmental concerns – may or may not be present in the decision-making situation. At best, we face a context-dependent performativity.

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Mismatch or Misunderstanding? Economists and Consumers Framing Electricity Consumption in a Deregulated Market

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Abstract

This paper analyzes how economists engaged in energy policymaking and how household consumers perceived energy consumption, particularly with regards to electricity and the electricity market. We interviewed prominent economists and conducted focus group interviews with household consumers to explore these issues. Drawing on economic sociology, above all the contribution of Michel Callon, we analyze the processes of framing involved in the sense-making around electricity consumption and the observation that current policymaking has been fairly ineffective in stimulating energy efficiency in households. We find that the interviewed economists predominantly drew on a framing of electricity as a commodity and consumers as homo economicus. The interviewed consumers framed electricity as a public good and, accordingly, provided a more inclusive and complex framing of energy consumption. While the economists' framing was narrow in order to allow for calculation, the consumers' framing led to the use of "qualculation" (Cochoy 2008), which allowed them to consider moral, social and political issues. We ask whether the different framings emerged from consumers' misunderstanding of market mechanisms or from a mismatch in the ways in which framing occurred. The analysis supports the latter conclusion, which means that energy policymaking to promote energy efficiency is caught in a stalemate between calculating policymakers and qualculating consumers.

Keywords: *electricity market, deregulation, energy consumption, calculation, qualculation, framing*

Introduction

In many countries, policymakers have struggled to find instruments that effectively make households spend less energy and engage with energy efficiency (Geller et al. 2006). Biggart and Lutzenhiser (2007) suggest that policymakers rely too much on economics in their design of policy instruments and, because of this, researchers must investigate actual behavior with respect to energy consumption. In this paper, we pursue this line of inquiry by comparing the ways in which a group of economists advizing the government about energy policy (including energy efficiency) and a group of household consumers perceived these issues. Was there a mismatch between the respective outlook of the economists and consumers, or should we look elsewhere to explain the ineffectiveness of policy instruments designed by economists?

The context of our study was Norway, which was one of the first countries in the world to deregulate its electricity market in 1991. Before the deregulation, a number of local and regional utility companies produced electricity, nearly entirely from hydropower. The government made decisions regarding investments in new hydroelectric facilities, as well as the grid. The price was set on an annual basis in a way that accommodated investment needs and provided an economic surplus for the utility companies. By the end of the 1980s, before deregulation, the resulting system provided fairly abundant hydroelectricity at prices that consumers considered quite low.

However, during the 1970s, economists came to perceive this system as economically inefficient. Hence, a new system was designed to create a free market in which prices would more dynamically reflect the relationship between electricity demand and supply, and would allow consumers to make use of open competition to achieve cheaper electricity. It was also a specified goal of legislators to avoid unnecessary market interference from inconsistent

politicians (Karlstrøm 2012). The reform separated the production and grid maintenance aspects of utility companies, and grid monopoly was formalized. Norwegians could, in other words, buy electricity from any utility company in the country. This was supposed to produce greater price consciousness among consumers and stimulate energy saving by motivating them to save money.

As a pioneer country in this deregulating process, Norway provides an interesting case study for exploring the challenges of applying a market logic and market instruments to private energy consumption. The reform was, above all, motivated by expectations of increased revenue from electricity production, but the argument that deregulation would increase price consciousness among consumers was also important (Karlstrøm 2012). However, a study performed a few years after the deregulation demonstrated that consumers neither understood the market nor acted as informed customers. Energy was still perceived by the majority of the people interviewed as a public good, and the study indicated that changes in consumer attitudes and knowledge would take time and require changes in everyday life routines (Aune 1998). A more recent study based on survey data from 2009 found that this situation had not changed much. Today, accounts of electricity consumption from most Norwegian households show that consumers still do not behave as market actors in the way assumed by economic theory (Karlstrøm 2012). How should we understand this situation, and how do economists account for it?

Sociologists claim that energy use is entrenched in habits that are difficult to change (Gram-Hansen 2010; Shove 2003; Shove et al. 2008). Therefore, energy consumption patterns are fairly stable and resistant to change. While this observation helps us understand why the economic rationality heralded by economists has not been taken up more widely by consumers, issues remain with respect to the way in which economic arguments have been dealt with, as well as the reason economists have not adjusted their accounts of household energy consumption. This paper approaches these questions by comparing the way in which economists engaged in energy policymaking and household consumers respectively described their energy – particularly electricity –

consumption. The analysis focuses on the question of whether consumers simply did not understand economic arguments, or whether their different accounts emerged from disparities in their understandings of energy and energy consumption, which led to a perceptual mismatch.

Recent social science studies of energy consumption and energy efficiency have faulted economists for externalizing socio-cultural dimensions of energy use. For example, in studies of energy culture, private energy consumption has been understood as a result of a combination of activities, preferences, values, technologies and material structures (Aune 1998; Stephenson et al. 2010). Economic sociology has demonstrated how factors such as beliefs and status aspirations are heavily involved in decision-making with respect to energy. Also, social relations and cultural variability have been seen to effect actions related to energy consumption (Biggart and Lutzenhiser 2007). Still, many studies, like that of Ek and Söderholm (2010), have observed that economic aspects are important. These studies have claimed that both economic and environmental motives play a role in households' decision-making processes (see also Karlstrøm and Ryghaug 2014). Given this, it is conceivable that there may be both a misunderstanding and a mismatch in the perception of energy and energy consumption among economists and consumers, respectively.

To explore this, we introduce some theoretical tools in the next section; these tools are, above all, drawn from recent sociological efforts to explore market design. These efforts reflect the need for studying household energy consumption in relation to a deregulated electricity market and policies to stimulate energy efficiency. Subsequently, we explore economists' and consumers' understandings of private energy consumption.

Understanding markets

Economic sociology analyzes markets in terms of either networks, institutions or performances (Fourcade 2007; Fligstein and Dauter 2007). Here, we pursue the latter idea, that markets are made or constructed. According to Michel Callon

(1998), markets are designed by economists. Specifically, Callon (1998) argues that markets are made through the efforts of economic, legal and other experts, as well as a diversity of socio-technical devices to facilitate the calculations that underpin market actions (Callon 1998; Callon and Muniesa 2005; MacKenzie et al. 2007). Thus, market behavior cannot be taken for granted. Suppliers and consumers must be shaped and disciplined from particular constructions for a market to "work" (Callon et al. 2007; MacKenzie et al. 2007). What does this entail?

Callon (1998) proposes that we analyze the design of markets through the concepts of framing and calculation. Thus, inspired by interactional sociology (Goffman 1974) and concepts from economics, he presents a new way of investigating markets. Framing is the process whereby some elements are made part of the calculation practices of a given market, while other elements are externalized and are thus left out of calculations (representing overflows of the framing). Calculation practices are related to costs, prices, profit and utility. In this paper, we are interested in the ways in which policymaking economists and ordinary consumers framed household energy consumption, including energy efficiency activities, and how they conceived the resulting calculation practices.
We may study how the abovementioned actors framed energy consumption by looking into the arguments they used to describe the electricity market. How did they describe supply and demand, as well as the interaction of these two activities? Framing is done to facilitate calculation, often by simplifying the issues that are potentially involved and by externalizing other issues. In economic theory, these externalities (or "overflows," as Callon characterizes them) represent exceptions or accidents that do not need to be part of the calculation practices:

> Framing defines the effectiveness of the market because, in this closed interactional space, each individual can take into account the viewpoint of every other individual when reaching a decision. In this sense, it is possible to assert that externalities are simply

> the results of imperfections or failures in the framing process. (Callon 1998: 5)

However, if the overflows become problematic, reframing may be necessary. From a sociological perspective, contrary to the economic approach, overflows are seen as essential parts of the surrounding contexts of phenomena like energy efficiency. Thus, overflows should be included in the framing process to become part of calculation practices. To the economic sociologist, this poses a dilemma, because framing may be less effective without externalization. This is part of the "dual nature" of framing: elements that contribute to stabilizing and structuring the frames of interactions (i.e. facilitating calculations) are also sources of overflows.

In order to embed or integrate overflows in the processes of framing, externalities must be made measureable: "Without calculative agents and without the minimum level of information that allows such calculations to take place, market coordination is bound to fail" (Callon 1998: 8). This may or may not be true. First, there is the issue of whether all market actors need to frame the market and the related consumption in the same way and use the same calculation devices. Second, we may ask what happens if there is a diversity of frames and calculation practices. In this event, will market coordination fail? If so, with what consequences?

It seems reasonable to assume that production, as well as consumption, requires calculation. However, many of the qualities that characterize consumer attitudes and behavior with respect to, for instance, energy efficiency and use, are not easy to measure numerically. These qualities include features like needs, values, household infrastructure and so forth. When such elements are put inside the frame of calculations, the use of standard calculation devices becomes problematic. To overcome this challenge, Cochoy (2008) proposes that we replace calculation with "qualculation." This suggestion is based on his study of supermarkets and shopping carts, which demonstrated that consumers transform their calculation skills when they transport groceries through a store.

He found that, during the process of shopping with a cart, consumers considered family needs, product qualities, market information and shopping equipment, in addition to economic considerations. Consequently, they engaged in processes of qualculations, or "quality based rational judgment" (2008: 17), rather than mere calculations.

This paper investigates the ideas and arguments about consumers and consumption that were articulated by policymaking economists engaged with energy and by household consumers. More specifically, we examine how these two groups framed electricity consumption and their respective use of calculating or qualculating devices. We focus on electricity because this is the main source of energy for most Norwegian households. As it would have been surprising to find no differences between the two groups, the primary aim of our study was to determine what constituted the differences and what these differences could tell us about the relationship between the groups. If the differences were found to be the result of consumers' misunderstanding of economics, then we would expect to see similarities with respect to the two groups' respective framings and calculation efforts. If there was a mismatch in their understandings – a matter of the two groups so-to-speak belonging to different worlds – then this should be evident from fundamental dissimilarities with respect to their framing efforts. In addition, it seems reasonable, in the latter case, to assume that economists would use calculation devices, while consumers would engage with qualculation.

Method

The paper is based on two sets of data. Dataset 1 consists of 15 individual expert interviews that were conducted in 2009. We started by selecting interviewees who had played a visible role in the deregulation of the electricity market. Then, we used the so-called snowballing method (Morgan 1997; Krueger & Casey 2009; Stewart et al. 2007), by which interviewees suggested other people for us to interview due to their role in policymaking or as advisors to policymakers. The interviews, which were qualitative and semi-structured, lasted one to two

hours and were taped and transcribed. The interview guide focused on interviewees' opinions of the design of the deregulated system and how the market had actually turned out to work. For the purpose of this paper, in the analysis, we primarily focus on the points of view regarding household consumers and energy consumption. With the exception of two lawyers and one engineer, all of the interviewees were economists or had economic expertise (for instance, one was a former Minister of Finance). In this paper, we only quote those with economic expertise and consequently refer to these interviewees as economists.

Dataset 2 consists of nine focus group interviews, which were conducted in 2009. A total of 44 people were interviewed: 19 women and 25 men. The interviewees provided considerable diversity with respect to age, gender, occupation and geographic belonging. There was also substantial variation in political views and knowledge of and attitudes towards energy consumption and the electricity market. We recruited the participants through existing social networks and snowballing (Morgan 1997; Stewart et al. 2007). The focus group interviews took place at locations familiar to the interviewees, like their places of work or homes. They lasted for approximately one and a half hours and were taped and transcribed. In the analysis, interviewees are referred to with fictive names to preserve their anonymity. All quotes were translated into English by the authors.

The focus group interview method is well-suited for exploring attitudes and arguments (Morgan 1997; Ryghaug et al. 2010). We used a semi-structured interview guide that accommodated participants' own inputs (Morgan 1997). The interview guide focused on participants' everyday energy consumption, their efforts (or lack of effort) to improve energy efficiency and their perceptions of Norway's energy policy and the deregulated electricity market.

The analysis of both sets of data was inspired by grounded theory (Strauss and Corbin 1998). Using interview summaries, we examined the interviews for categories of, e.g., arguments about energy consumption, act of calculation and

qualculation, values and expectations. Also, this provided us with a picture of how the interviewees framed consumption within the deregulated market. In this process, we also selected quotes from the interviews to represent the categories that emerged through data coding.

The economists' framing: Consumers as free and informed

When the Norwegian Parliament passed the New Energy Act in 1990, their aim was primarily to make the electricity system more economically efficient. The groundwork for the market reform was done by a group of economists at the Norwegian School of Economics and Business Administration (NHH) in the early 1970s (Karlstrøm 2012). Still, Norwegian policymakers assumed that the reform would also cater for energy efficiency in households. How did the interviewees frame electricity consumption about 20 years after the New Energy Act had been passed in Parliament?

To begin, all interviewed economists considered the deregulation to have been mainly motivated by what they called overcapacity in electricity production. Since the electricity sector had been thoroughly regulated (with prices set by Parliament), they considered the production of electricity to have been inefficient. For example, it was claimed that the electric utility companies had let water pass through their facilities without producing electricity, and thus had potentially lost large amounts of money. As a high-ranking civil servant and economist put it: "The profitability of the production of hydropower was poor. This was an industry with large competitive advantages, which did very badly. In addition, there were many signs of overinvestment."

Thus, when we brought up the 1990 deregulation through the New Energy Act in the interviews, we were, above all, told about a previous system of electricity production that had been badly in need of reform. Industrial development in post-war Norway had been closely linked to investments in cheap hydropower to produce aluminum and other metals, as well as pulp and paper. The interviewees saw this industrial development as eventually leading to

overinvestment. At that time, the aim was cheap electricity, not a profitable electricity sector. A former Minister of Oil and Energy, who had played a major role in the reform, claimed that: "Previously, one could develop [new hydropower facilities] without a concern for profit. One would get rid of a part of it [electricity] anyway; it was only a matter of putting the price sufficiently low."

Thus, the interviewees were primarily concerned with the utility companies. The economists were supported by influential members of the Labor Party, with a former Minister of Finance stating: "This reform was overdue (…). the old system overrated itself (…) it would be very harmful if our party (Labor) should be perceived as museum guards." In this manner, the deregulation of the electricity market was described as progressive and necessary. Briefly summarized, the interviewed economists stressed the following aspects of the decision to deregulate: (1) deregulation would create a real market, prevent overcapacity and provide a more economical and rational use of the electricity grid, (2) Norway would become part of a larger energy market and would be able to buy and sell energy and (3) electricity could be sold wherever profit was best.

When prompted to speak about household electricity consumption, the interviewed economists argued that private consumers should clearly benefit from deregulation. However, this positive outcome was thought to depend on utility companies fulfilling their role as retailers and providing customers with sufficient information and good service. If consumers were to receive information and service, they were expected to act economically rationally and to use their consumer power to choose the most favorable supplier. In this way, consumers were expected to exercise control of their expenses.

Two important observations may be made from this. First, the economists argued from a framing of electricity as a *commodity.* Second, the interviewed economists framed consumers (and utility companies), rather than consumption (or production). The economists primarily viewed consumers as economically rational decision-makers. This meant that they were framed as homo economicus. The same rationality was also assumed to direct the actions of

suppliers. Thus, the economists believed that electricity should be offered at the right price and be easily accessible, and that consumers should be informed and properly serviced, should exercise autonomy and should make rational choices with respect to their electricity demand by calculating needs in the context of relative prices. It followed from this framing that consumers and utilities were dependent on each other to make the system beneficial. The expectation was that deregulation would discipline electric utility companies, as well as customers.

A main point was articulated by one of the economists behind the initial market design underlying the New Energy Act – namely that consumers should be provided the freedom to choose their electricity supplier: "It was primarily about (…) breaking the link between production and distribution. Demonstrate that one [customers] had freedom of choice to buy so-to-say from wherever one wanted." However, in line with traditional economic theory, electricity customers were seen as needing sufficient and reliable information. This argument, central to the framing of electricity consumers, was emphasized by the observation that the public must be provided with access to updated facts about the prices of every utility. In this manner, customers would be able to choose the cheapest supplier.

Moreover, a customer who was well informed about prices was expected to make rational choices with respect to future investments in energy use and energy efficiency. Good information was argued to provide consumers with the opportunity to calculate future electricity expenses and to consider whether energy saving investments would reduce electricity costs. This was explained in the following manner by an economist with a leading position in the Ministry of Oil and Energy:

> If it turns out to be very [expensive] and you cannot make it, you abstain from the project or improve the insulation of your house (…) then there is an underlying economic idea (…). We [economists] are on fairly safe professional ground when we believe that this [the market reform] is a rational way to do things

> in that you get a sufficient amount of electricity at a lower price than you otherwise would have done.

In this way, consumers were thought to benefit from the deregulated market as long as they acted in the expected rational manner.

However, the interviewees were aware that consumers could face difficulty understanding how the system worked and appreciating the benefits of the system. This was particularly outspoken in relation to times when prices were high. At these times, the economists claimed that people felt provoked because they did not understand why prices were beyond political control:

> They are provoked by the fact that decisions are made in a market, and they are told that prices have to rise, otherwise we will have too little electricity left for spring. This only makes them angry. So they demand that the government (…) hereafter has to intervene.

As a prominent economist researching energy issues put it: "In 2002 and 2003, when prices nearly rose to about one [Norwegian] krone per kilowatt hour [approximately 0.12 €], then many people yelled and shouted, you know?" The latter interviewee wished to inform the public and wrote a newspaper article in which he encouraged people to choose so-called "spot contracts," because this would be cheapest in the long run: "Even if the prices are high in the short run, this will only last a brief period. It proved also to be that way. And there was a lot of information about this."

The same economist further claimed that people had really started to listen, and that this, together with more general information about the market, would eventually lead to a change in behavior:

> Increasingly, people have become more market conscious. That is reasonable for many reasons. First, there is a lot more information available. That you should be aware, right? Information has been made available about how to find the data needed to start changing

> [utilities]. How easy is it? That's one thing. Another issue is that the price of electricity [per kWh] has risen from 20 øre [0.04 €], to – it was about 40 øre [0.08 €], wasn't it? Now it is 30 something, it has been up to close to 50 øre, but as prices rice, the more lucrative it will be to do transactions like this [changing utility], right? I mean, if interest rates are high you run to the bank and check, don't you?

His conclusion was that, when it proved profitable to change electricity suppliers and information was sufficient, people would respond as rational actors. These claims were supported by another energy economist:

> When prices increase, you use less electricity. Then you get what economists call automatic stabilizers. You get a reduction in demand (…) so that you avoid scarcity (…). In the short run (…) there is nearly no price sensitivity. But in the longer term, when people have time to change and make some adaptions, then the price sensitivity is quite significant.

Actually, some of the economists framed consumers in two ways. On the one hand, consumers were framed as economically rational actors who were expected to act on price changes and options related to changing to utility companies that sold electricity cheaper. This frame of rational calculation was contrasted with the second, which stipulated that consumers did not act according to rational economic calculations. The energy research economist quoted above put it bluntly: "If you don't bother [to change utility companies], then it's a bit your own fault. Because 'out there,' the competition is pretty good." However, this point was not shared by everyone. For example, another economist who researched energy issues argued that it could actually be rational for consumers not to respond to price signals: "Quite a few consumers who refrain from acting in the market, lose in the magnitude of a couple of hundreds [NOK, approximately 12–25 €] a year. It is not particularly irrational to refrain from that." This argument implied the assumption that consumers acted rationally, but they reacted in different fashions to calculations related to electricity consumption. Thus, the economists disagreed about how they should

consider rationality, but they nevertheless agreed that the homo economicus frame, with its emphasis on calculative behavior, provided the yardstick.

Further, the interviewees argued that good information and service from utility companies would change energy consumption in the long run. However, it was not just consumers who they felt needed to be "educated" through this process. In order to succeed in changing consumer behavior with respect to buying electricity, it was considered necessary to transform the culture of utility companies to make them provide better service. As the former Minister of Oil and Energy put it: "There is to date no invention that works as well as competition [in a market] to encourage better customer service, improved levels of service and greater awareness of ingoing costs and outgoing prices."

However, putting this in place proved to be demanding. The former minister claimed that, in the beginning of deregulation, the utility companies were in shock and remained passive. It seemed difficult to get through to them with the message that if customers were dissatisfied with their utility companies they could change their suppliers. Hence, the customers' position was "dramatically strengthened." In his opinion, it was a story of David versus Goliath:

> Because you have got a monopolist with rationing power and the power of setting prices, naturally speaking. When you remove it [the monopoly], this will give the consumer what a consumer needs to exercise power, which is freedom to choose. This is simple – and the simplest is often the best, right? (…) This has been a success. The consumers have been raised to an equal level [with the utility companies].

It is important to note that the interviewed economists argued from a theoretical point of view. They all seemed to agree that the deregulated electricity market had been designed to provide consumers with sufficient information and good service. Consequently, consumers had been empowered to make decisions regarding their electricity consumption according to their (best) economic

interests. None of the interviewed economists seemed to care much if real market behavior differed from their theoretical assumptions. Actually, in general, they expected the logic of the market to discipline consumers more or less invisibly.

Energy efficiency concerns were not explicitly articulated by any of the economists. This clearly indicates that such concerns were not key considerations with respect to the deregulated electricity market. However, the lack of explicit focus on energy efficiency may also be explained by the reasoning around the dynamics of electricity consumption and prices. The predominant homo economicus framing implied an assumption that, in the long run, consumers would consider their electricity costs and invest in energy efficiency measures and/or save electricity. In this way, energy efficiency measures would be made on the basis of more or less complex calculations involving electricity bills, investments to increase energy efficiency in homes, and added comfort and convenience from consuming electricity. Consequently, energy efficiency behavior was taken to be part of calculation efforts prompted by the deregulated market and the provided information about costs and prices.

According to Karlstrøm (2012), a substantial majority of the Norwegian (adult) population does not act according to the assumptions of the interviewed economists. For example, the public shows less concern with respect to prices, and few people actively search for the utility companies offering the lowest prices. In the following, we explore the reasoning around electricity consumption as observed from the focus group interviews. From the interviewed economists' point of view, rational engagement with the electricity market gave considerable economic benefits and thus encouraged consumers to enact the homo economicus framing. If consumers did not perform in this way, would it be because they did not understand the implications of the deregulated market and the opportunities it offered, or because they thought about energy consumption in a distinctly different manner?

The consumers' framing: Transaction costs, trust and collective fairness

During the focus group interviews, participants were asked about electricity consumption and costs, energy efficiency and energy efficiency measures. These issues generated a lot of discussion, and the emerging framing of energy consumption and the electricity market was more complex and heterogeneous than what we observed among the economists. It was also less straightforward and took some effort to understand.

To begin, a main impression from the focus group interviews was that energy costs mattered. Saving money was presented as the main motivation for saving energy. One of the younger men put it bluntly: "cutting the energy bill is crucial"; elderly people used similar arguments. Thus, at first glance, it appeared that the consumer interviewees shared the economists' framing. Not all of the interviewees claimed to be personally affected by high prices (as they had high incomes), but they still argued that the price mechanism would be the most effective instrument for reducing private energy consumption. Further, they presented electricity costs as the main driver for new energy saving technology in households:

> When your electricity bill is 600€ instead of 200€ as it used to be, you start thinking about what to do to reduce the bill. Perhaps it would be wise to invest in this and that technology. That's no issue when your bill is low (Richard).

In this way, the consumer interviewees came forward as homo economicus wannabes. At least there was little doubt that they knew how they were supposed to act, in general terms. Thus, it did not seem that they had any misunderstandings related to the way in which markets were generally supposed to work. Nevertheless, we characterize these consumers as "wannabes" due to the way in which focus group discussions tended to shift towards critical views about the electricity market, then to a focus on mainly non-economic issues related to electricity consumption.

A fairly innocent example of this was found in some interviewees' description of their electricity consumption as a kind of competition to spend less – or at least not more – than they had in the previous year. This was easy to do, as their bills included diagrams comparing the current year's consumption with that of the previous year. This inspired consumers to save, in order to beat their previous record: "We take some pride in being better than last year" (Theodor). These interviewees presented the competition as more important than the actual money savings.

Although the interviewees understood that electricity prices varied between companies, very few said that they cared to shop for the lowest energy price. Most reported sticking with their local utility company, with which they had a long-term relationship. Moreover, they found it difficult to navigate the electricity market, which was considered confusing and unreal. Many complained that gathering information about utility companies and prices was actually difficult. Moreover, price differences were seen as minor. According to several of the interviewees, spending time and energy to locate "the best deal" was not worth the trouble. Some claimed that they would "go crazy" if they were to even try to keep track of the changing prices in the market. The transaction costs of staying informed were considered too high, since the potential gain was so small. Consider the following exchange in one of the focus groups:

> Rudolf: No, we can't do anything with those prices, so it is no use in being bothered (…).
>
> Johan: At the end of the day, I don't think it's worth it.
>
> Rudolf: I have a motto – don't be bothered. And then I just pay the bill without making protests. We can't do anything about it.

Transaction costs related to finding – and acting on – the correct information explained some of the resistance to behaving as "rational actors." Rudolf even stated that it would "ruin the quality of my [his] life" if he were to try to keep

track of electricity prices. Actually, only one of the 44 interviewees claimed that he had saved a lot of money by changing suppliers.

Were these attitudes caused by a lack of correct information? While some of the interviewees found it difficult to gather sufficient information, lack of information was not an issue for the majority. Rather, they did not find the available information relevant. This was not the only problem. If we return to the focus group exchange quoted above, we see Rudolf voicing the concern that it would not really matter what he did. He considered the price of electricity to be beyond his influence; consequently, he had decided not to bother. Underneath this argument was a complaint that the electricity market was opaque and unpredictable, which, in turn, implies that the market was seen to be unreliable. This point of view is clearly presented in the exchange below:

> Anita: I sometimes feel that when you try to save energy, it does not show. You get nothing in return from saving. It does not show anywhere that you are saving electricity. Of course, you are supposed to understand that you are saving the environment or something like that if you use less energy, but it would have been nice if the bill got smaller, for instance. But it does not.
>
> Grete: And still the bill only gets bigger every time you receive it.
>
> Ida: You save energy and spend less kilowatt-hours, but on the bill of that year´s total usage of energy, something else has increased, like grid costs or something, so you are not able to lower your electricity bill (…).

There is a deep irony in this exchange. The women expressed the feeling that their efforts to save energy should provide them an economic benefit, which is a reasonable interpretation of the economists' argument that reduced demand should lead to lower prices and definitely to lower bills. When this economic benefit was not experienced, it led to critical considerations. The simple calculation they hoped to make – less consumption, smaller bills – proved

incorrect, as new items, like grid costs, were added. This created frustration and a lack of faith in the mechanisms of the electricity market. Electricity savings were seen to be unrewarded because the premises of calculations had changed in ways that were considered disfavorable to consumers. These changes were argued to be difficult to understand, not only because of increased complexity, but also due to what was considered unfair:

> Gunn: No, I do not understand why the price of the grid use is higher than the price of the electricity itself. I find that very strange.
>
> Hans: I think the prices are way too high. We, who have enormous amounts of energy, should not have to pay so much for it.
>
> Gunn: It is unfair.

The deregulation of the electricity market in 1991 introduced free trade in electric power, but a regulated grid monopoly. Many of the interviewees did not understand this system and the implications of, for example, the need for investing in an improved grid system. This reinforced the effect of the transaction cost arguments. First, the gain from changing utility companies was considered too small to merit the effort of monitoring prices. Second, electricity bills were considered too unpredictable to merit the work needed to save energy. One could say that the initial general claim of economic rationality had been frustrated – often to the extent of putting it out. The interviewees felt that they lacked the control of their electricity bill needed to save costs.

The pricing system also appeared strange and difficult to navigate because of the perceived discontinuation of an expected link between precipitation and electricity prices. Historically, a lot of rain in a region was believed to result in reduced energy prices. However, this was no longer seen to be the case. The claim was that it could pour down for weeks and prices would still increase: "And they talk about the energy crisis you know (…) the need to increase the production and build more power plants. Well, it doesn't make sense to me all

the time they are exporting electricity to other countries for a low price" (Anita). The interviewed consumers were aware that Norway was part of a North European electricity market and that there was considerable export and import of electric power. Nevertheless, this knowledge tended to be rendered irrelevant by the frustration caused by what was seen as dissolution of a historically strong correlation between much rain and low electricity prices.

The resulting framing tended to externalize consumers' ability to act; household consumers were rendered victims of an opaque system. Efforts to reduce electricity costs were considered fairly futile because, seemingly, new items were added to the bill that cancelled out consumers' saving efforts in unpredictable ways. The result was a low level of trust in the market and a widespread idea that it was useless to change everyday life routines, since there were so many other variables with greater influence on the bill than their individual actions. Calculation appeared to be difficult.

We saw above that the economists approached the issue of electricity consumption by framing electricity consumers. Underlying the resulting homo economicus frame was a framing of electricity as a tradable commodity and an understanding of the market as an institution that would transform consumers into economically rational actors. The framing of energy – or rather electricity – consumption that took place in the focus group interviews was more complex. First, electricity was framed as a public good, and consumers felt they had an established right to plentiful access to energy at low prices (consider the above exchange between Gunn and Hans, and their emphasis on fairness). Thus, many felt that politicians had an obligation to provide households with clean, inexpensive electricity. When this obligation was not met, consumers developed a distrust of politicians, as well as the market. As we saw above, some economists had noticed the presence of this argument, but it had had little or no impact on their framing of electricity as a commodity.

Second, the interviewed consumers considered the electricity market opaque, inconsistent and unpredictable. In addition, the deregulated market was seen as

an infringement of their right to cheap and plentiful electricity. The consumers believed that they were economically rational, but they found it difficult to enact this rationality. Did these arguments mean that electricity prices were perceived as irrelevant and outside the framing of electricity consumption?

This was not the case. People tended to internalize prices in their framing of electricity consumption, but in a different way than was demonstrated by the economists. Many of the consumer interviewees who claimed that there was no noticeable economic benefit to changing suppliers or saving electricity still argued that electricity should be cheaper. Their arguments were in line with the predominant view of electricity as a public good. People argued that electricity was a necessity, and that one should be able to use whatever was needed without having to worry about the electricity bill. In a cold country with an energy surplus, it was considered unfair that electricity was expensive.

For example, Hans, a retired man living in the northern part of Norway, felt that it was illogical to treat electricity as an ordinary commodity. He kept himself informed about electricity prices through the newspapers and was very upset to observe that the electricity prices where he lived were higher than in other parts of the country. While consumers had to pay increasingly more, he argued, utility companies reaped large economic benefits: "It has become an international market with international prices, and if you look at the annual results of these utilities, they show large profits."

Accordingly, the discussions in many focus groups became increasingly centered on moral issues: What is a fair price? How much electricity can one rightfully consume? Do Norwegians have particular rights in this respect? In this manner, the framing process became more concerned with consumption than with consumers. This complicates the comparison of the interviewed consumers with the interviewed economists.

In economics, a free market is shaped by supply and demand. Consumers are framed as rational, informed and free to choose their suppliers. Consequently,

they are expected to perform calculations based on cost, utility and other economic variables. The focus group participants began the session by providing accounts of calculative action, but shifted throughout the interview to place much greater emphasis on moral issues. As citizens of a cold country that was rich on energy, they felt that a high price on electricity was unfair. Seemingly, many would have preferred the old system, in which electricity was a public good, energy prices were set by the government and utility companies were responsible for delivering electricity at a set (reasonable) price all year round.
In other words, they came to engage with what Cochoy (2008) labelled qualculations. Rather than just performing calculations regarding costs, benefits and possible savings of electricity and money, they made judgments that included moral and political considerations. The preference for qualculation was partly based on claims that the electricity market was opaque and unpredictable. This meant that many felt it was futile to change their daily routines to save electricity in order to save money, because they were unsure whether their bill would actually be reduced. The preferred framing of electricity as a public good also led to qualculations. Other concerns had the same effect.

For example, when the climate mitigation problem, a part of the energy efficiency issue, was mentioned in the focus group interviews, the participants used qualculations in their assessment. Many showed a preference towards universal measures that would be imposed on everyone, as opposed to voluntary quotas that would make it possible for rich people to "pay their way out" of the problem. At the same time, the issues were complicated and positions were less than stable. Consider the following exchange:

> Else: I feel feeble – it is like "remember to turn off the light and lower the temperature in the night."
>
> Ingrid: Then I actually think more about the electricity bill, than (…) [the climate problem]
>
> Else: Yes, I am absolutely motivated by it.

> Katrine: But at the same time there are people with single family houses of 200–250 square meters – they use far more than we who have small apartments. And if the light is on in the bathroom through the entire night, it doesn't matter.

Else was frustrated by the meaning of climate issues with respect to her electricity consumption, and thus struggled with qualculation. Ingrid then suggested that it was more motivating to save energy by keeping electricity costs at bay, which suggests the importance of calculation, rather than qualculation. Katrine then entered to change the debate to a matter of acting and not acting in a situation of social inequality, which suggests a way of qualculating. This exchange shows, in a very interesting way, how focus group participants quickly could shift between a cost frame and a moral frame and, consequently, between calculation and qualculation. While such shifts happened in many focus group discussions, this was never a definitive move. The framing of energy consumption seemed to vary according to the context of the discussion; it was flexible. When climate concerns were introduced, the consumers tended to engage in qualculation. Arguments related to energy as a public good had the same effect. However, when the main focus was on prices and investment costs, calculation was the preferred approach.

Conclusion: Of two worlds?

This paper has demonstrated how policymakers and household consumers framed household energy consumption and the electricity market in distinctly different ways. The economists framed electricity as a commodity, the electricity market as a producer of economic rationality and the household consumer as homo economicus. Their framing was fairly simple and consistent, and was based on their professional training. It externalized many social and moral issues in order to allow for calculation activities.

The interviewed consumers offered a more complex and context-dependent framing. They framed electricity as a public good and the electricity market as

opaque and unpredictable. They framed themselves as economically rational, not the least through transaction cost arguments to explain why they had not changed to the cheapest electricity supplier. However, overall, the consumers integrated many more concerns in their framing than did the economists, including moral issues like fairness and political concerns like climate change. This made them often – but not always – reliant on qualculations, rather than calculations.

Should we see the dissimilarities in the respective framings of economists and consumers as a result of consumers' misunderstanding of the electricity market and related policy measures? Clearly, some aspects of the situation were difficult for consumers to comprehend. In particular, the relationship between grid costs and electricity costs was unclear to most of the interviewed consumers. However, they knew a lot about how they were expected to act in relation to price changes and shopping for cheaper electricity. Possibly, some may have found it easier to navigate the electricity market if the grid issue had been taken care of in a way that was easier to understand. However, when the electricity market did not produce more concern for energy efficiency, this was not because consumers did not understand how the market operated.

Rather, the ineffectiveness of the energy efficiency policies of the last decades should be understood as the result of a mismatch between the ways in which electricity and electricity consumption have been framed. Most importantly, the difference between a commodity and a public good framing of electricity produces completely different outlooks and expectations. Further, there is no doubt that the fairly narrow framing by economists of electricity consumers has produced a considerable overflow. The consumers seem to manage this overflow by turning to qualculations – acts of balancing a diversity of moral, social and political issues with some concern for economic outcomes. However, current energy efficiency policies remain based on the idea that consumers only calculate the balance of costs and benefits. This mismatch in emphasis between calculation in policymaking and qualculation in actual practice seems to represent a stalemate in the need to improve energy efficiency in households.

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Concerned Consumption. Global Warming Changing the Domestication of Energy?

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Abstract

Most countries have increased their focus on climate change mitigation, and this has produced concerns over how best to stimulate energy efficiency in households. However, it remains unclear whether a focus on global warming has effected households' domestication of energy and energy consumption, and, if so, in what ways. In this paper, we examine this issue by comparing the domestication of energy within Norwegian households during two time periods: 1991–1995, when climate change was given little attention, and 2006–2009, after climate change became a major public concern. Due to its rich supply of energy, Norway can be seen as "a hard case" with respect to changes in energy domestication. In our study, we referred to five datasets; two surveys, one qualitative interview study and two focus group interview studies. In the first period, the domestication of energy was characterized by a widespread assumption of the abundance of energy – in particular clean hydroelectricity. Thus, the resulting energy culture emphasized comfort and convenience with respect to everyday life, and showed little motivation for saving energy. In the second period, this culture was found to have changed, but only in a small way. It was much more common for households in the second period to be concerned about energy consumption, which they understood to be linked to climate change, and many claimed to try to save energy. However, the dominant expectation was that everyday life could still be managed in a convenient way, in order to provide comfort. Thus, in the second time period, climate change concerns produced some but not really profound changes in the practical domestication of energy. Rather, the main impact was bad consciousness, which was tempered by arguments over why change is difficult and complaints about political inaction.

Keywords: *energy efficiency, climate change, energy cultures, domestication, households*

Introduction: A changing context of energy consumption

This paper investigates Norwegian energy culture over a period of two decades, based on data from interview studies and surveys. These data allows an analysis of possible changes in the domestication of energy and consequent energy consumption practices over time. The aim is to clarify the effects of the increased attention to global warming over this time period. To what extent did the growing concern over climate change produce changes in people's relationships to energy? Statistically speaking, and contrary to expectations driven by the substantial population growth at that time, household energy consumption leveled out over the period (Hille et al. 2011). Nevertheless, there is a lack of knowledge regarding the underlying features of household energy consumption. Hille et al. offer some suggestions, including the increased energy efficiency of homes; however, it remains unclear whether this increased energy efficiency is mainly an indirect effect of refurbishment activities.

Norway represents an interesting context for an examination of the extent to which climate mitigation issues transform people's relationship to energy and their consumption of energy. In many ways, Norway could be considered "a hard case" for such changes. The Norwegian energy situation has remained relatively stable, with fairly abundant resources of oil, gas and renewable hydropower. Nearly all Norwegian electricity is renewable, and it has remained relatively cheap, except during some periods of extended cold weather. Still, Norway has begun to invest considerably in new renewable energy. Within this context, over the time period studied, energy efficiency was on the political agenda, which showed 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 are disagreements with respect to the seriousness of the situation (Ryghaug et al. 2011). Thus, while there are widespread concerns about global warming, it remains unclear whether these concerns are being translated into new ideas and new practices with respect to the consumption of energy.

Traditionally, research on energy consumption has framed this as mainly an economic issue, focusing on the effects of energy prices on consumption patterns. A common finding is that price elasticity is quite low and, thus, the effect of prices on households' energy consumption is also fairly low (Zarnikau and Hallett 2008). Alternatively, energy efficiency has been framed as a technological or techno-economic issue. This framing has been severely criticized:

> [T]he techno economic model (…) functions as a self-sustaining, mutually reinforcing package of beliefs. Each element of this pervasive bundle – the transferability of technical knowledge, the individualistic theory of technical change, the sequential logic of research and development, and the implicit distinction between the social and the technical – feeds into the next, creating a web of belief strong enough to encapsulate technical researchers and policy makers, and elastic enough to span countries and continents (Guy and Shove 2000, p. 63).

However, alternative social science approaches have been developed to overcome the weaknesses of economic and techno-economic approaches to understanding household energy consumption. These approaches can be categorized according to the way they frame energy efficiency and the issues they bring forward for particular scrutiny. There is no unified social science approach to energy efficiency and energy consumption concerns, but the social science frames have some common calls. First, they criticize economics and

environmental psychology for focusing solely on the (rational) individual when framing energy efficiency and thus omitting societal factors. Second, they contribute to more comprehensive understandings of attitudes and behaviors, new disciplinary insights and better dealing with complexity in policy-making through their analysis of energy efficiency and energy use. Nonetheless, there are also substantial differences within these social science approaches, which become evident with closer scrutiny.

One social science approach has developed through economic sociology. By investigating actual economic behavior and analyzing empirical settings to understand energy use and choices, economic sociologists focus on the complexity of the social nature of economic behavior. With this approach, both economic and environmental motives are considered important to households´ decision-making with respect to energy consumption. In this way, economic sociology claims to offer a better understanding of energy efficiency, especially in regard to economic rationality, organizational dynamics, markets and the social context of policy (Biggart and Lutzenhiser 2007; Ek and Söderholm 2008, 2010; Thøgersen et al. 2010; Winther and Ericson 2013).

A second approach uses a community frame, wherein low-carbon communities are presented as a potential solution for four persistent problems in energy demand-side management: social dilemmas, social conventions, shared infrastructures and the helplessness of individuals when faced with the enormity of climate change. This means that energy users are framed as potentially engaged citizens who may participate in sustainable energy communities or lifestyle groups, in order to collectively develop alternative conventions and consumption patterns (Aall et al. 2007; Barr and Gilg 2006; Heiskanen et al. 2010).

A third frame focuses on technology, innovation and (lack of) communication, and stresses the importance of translation and the communication of energy efficiency and energy technologies. A main assumption of this approach is that energy inefficiency is mainly due to a communication gap between experts and

lay people, which may lead experts to misunderstand why households behave "irrationally," because they do not grasp consumers´ logic of energy use (Heiskanen and Lavio 2010; Hyysalo et al. 2013; Palm 2013).

A fourth approach is primarily concerned with barriers for energy efficiency. This approach involves a re-definition of the categorization of barriers, which, in turn, may lead to policy recommendations and suggestions for addressing energy efficiency gaps. This "barrier frame" is based on critical observations of weak links between attitudes and behavior, and argues for a lack of significant relations between total energy consumption and consumers´ value patterns, motives and problem perception of climate change. This approach suggests that energy efficiency policies based on strategies of internalized environmental responsibility or information, alone, are not likely to have much effect (Abrahamse et al. 2005; Carlsson-Kanyama and Lindén 2007; Slocum 2004; Thollander et al. 2010; Throne-Holst et al. 2007; Vringer et al. 2007).

A final frame focuses on energy cultures, and we draw on this frame in this paper. The approach builds on the assumption that energy consumption must be framed more broadly than it is in the dominant rationalistic economic frame, because many factors besides economic concerns must be considered, including values, household activities, acquired technologies and habits (etc.), when analyzing the energy use of households. Consequently, consumer energy behavior can only be understood through examination of the interactions between cognitive norms, material culture and energy practices; these aspects are linked to wider systematic influences of behavior, also referred to as the "contextual soup" (Aune 2007; Gram-Hanssen 2010; Stephenson et al. 2010; Young and Middlemiss 2011). Using this "energy culture frame" as a point of departure, we chose a socio-technical approach based on domestication theory to analyze the data for this study. In the next section, we discuss in some detail what this perspective entails.

Energy cultures and the domestication of energy

Clearly, singularly technological strategies are important, but insufficient, for improving energy efficiency in buildings, since people's lifestyles also have a considerable impact on energy consumption. The energy culture framework implies that a realistic understanding of energy consumption must consider energy use 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 consumed as a consequence of other activities, such as cooking, cleaning, working or driving a car; it is not consumed, as such. Thus, the consumption of energy in a household is an effect of the socio-material assemblage of the house, artifacts and activities. Domestication theory was developed to study the making and remaking of such assemblages (Sørensen 2006).

Analyzing processes of domestication means studying the development of practices – the construction of meaning and processes of learning with respect to a given area of concern, such as energy use (Sørensen et al. 2000; Sørensen 2006). A main advantage of this perspective is that it reminds us that sense-making is not just about *symbolic* meaning; *cognitive* and *practical* aspects must also be examined. Phrased differently, to pursue the concerns of this paper, knowledge of human-made global warming and the possible link between energy consumption and climate mitigation must be enacted in everyday life to cause effects. This enactment involves 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. Moreover, domestication may result in rejection, as well as acceptance, of market mechanisms or environmental problems, or to a variety of transformations of this knowledge. Rejection or acceptance may even depend on the perceived possibility of sense-making, as well as the transformation of practices.

Domestication, then, is a process wherein technological objects and the understanding of scientifically described phenomena (such as energy efficiency

or climate change) may be modified. However, people and their energy-related activities may also change. Thus, domestication offers insight into changes that take place with respect to human beliefs and actions, as well as to technology and the material environment (Aune 2007). Constructions of domestication may, according to Sørensen et al. (2000), be understood as micro-networks of humans, artifacts, knowledge and institutions. This means that, in addition to knowledge of energy efficiency and environmental problems (like global warming), knowledge of pertinent policy-making, political initiatives and everyday life practices may also be domesticated. Presumably, political action also sends messages.

Finally, domestication of energy-related artifacts and knowledge in households results in energy cultures. With this theoretical point of departure, energy cultures are understood to be socio-material assemblages constructed through negotiations between individuals, knowledge, technology and the wider context (Aune 1998; Stephenson et al. 2010). Energy cultures consist of everyday life practices and actions, but also symbolic interpretations of energy and energy-related artifacts and activities. In order to better understand the factors that influence energy consumption and to help identify opportunities for change, consumer energy behavior can be understood at its most fundamental level through examination of the interactions between cognitive norms (e.g. beliefs, understandings), material culture (e.g. technologies, building form) and energy practices (e.g. activities, processes) (Stephenson et al. 2010).

The energy culture framework is change-oriented, rather than deterministic: ”wider social, environmental and economic forces *structure* but do not *determine* people´s cognitive norms, practices and material cultures” (Stephenson et al. 2010, p. 6127). According to Lefebvre (1971), everyday life is related to the critical assessment of activities, and such assessment obviously represents a potential force of transformation. However, as indicated above, everyday life routines may be solidly embedded in the technologies that support these routines (Lie and Sørensen 1996). Moreover, the conduct of these routines seems to be based on widespread expectations of comfort and convenience

(Aune 1998; Shove 2003). Thus, it is difficult to predict how increased concerns over climate change, which is a potential basis for the reassessment of everyday life, would actually affect the domestication of energy in Norwegian households. It must be studied empirically.

In line with this, the paper examines whether the dominant Norwegian energy culture has changed due to increased popular consciousness of climate change. Did we find a link between concerns over climate mitigation and the accounts people provided about their energy consumption? How could this relationship be described? First, we employ domestication theory to investigate possible transformations of the sense-making related to energy and energy consumption. May we observe changes in the ways people thought about energy and their energy consumption in the Norwegian context? Second, we analyze whether energy consumption practices were modified accordingly. To do so, we study people's accounts of their practices and their resulting narratives about energy consumption.

Data

This paper is based on a re-analysis of available datasets. We addressed the above-mentioned research questions on the basis of qualitative interviews and survey data from two distinct four-year periods: 1991–1995 and 2006–2009. Five sets of data were employed. Dataset 1 consists of a national survey of 1,050 persons that was conducted in 1991. Dataset 2 comprises a qualitative interview study of energy consumption and everyday life, including discussion of how people perceived their energy situation at the time. Thirty-four in-depth interviews with altogether 60 persons were conducted between 1992 and 1995. Both sets of data are described in greater detail in Aune (1998).

Dataset 3 comprises ten focus group interviews with a total of 62 participants that were conducted between 2006 and 2007. These interviews were primarily concerned with climate change issues, including energy consumption. Further details are found in Ryghaug et al. (2011). Dataset 4 is a national survey of 1,500

persons that was undertaken in 2009. This survey covers attitudes towards sustainable energy as well as accounts of energy consumption and energy efficiency activities in households (see Karlstrøm [2010] for further details). The final dataset (dataset 5) comprises a series of focus group interviews that were conducted in 2009. Forty-four persons in nine focus groups were asked about their energy consumption and energy efficiency activities (see Godbolt [forthcoming] for further details).

Both surveys were sampled for representativeness of the Norwegian population. The interviewees in the qualitative studies (datasets 2, 3 and 5) were selected for diversity in terms of age, educational level, etc.; however, there was a small predominance of younger people in the focus group interviews. With respect to social background, participants had a somewhat higher level of education than the national average. Still, there was considerable variation along this dimension and in terms of engagement with environmental issues. For the purposes of this paper, the diversity of the interviewees was sufficient for comparisons across datasets. Moreover, in the analysis, we demonstrate diversity with respect to the domestication of energy.

The qualitative and focus group interviews lasted one to two hours and were taped and transcribed. The quotes used in this paper were translated from Norwegian by the authors, and we have tried to retain their oral qualities. In the presentation of the results of the analysis, we refer to the dataset from which the information was retrieved. The qualitative datasets were originally anonymized through the attribution of fictive names to the interviewees. When we quote from the interviews in this paper, we use these names and the dataset they belong to in order to reference the data. For example, if a quote is linked to "Åshild, 2," this means that the quote was taken from the Åshild interview transcript in dataset 2.

The analysis was initially based on the publications that originally analyzed the datasets: for datasets 1 and 2, Aune (1998); for dataset 3, Ryghaug et al. (2011); for dataset 4, Karlstrøm (2010); and for dataset 5, Godbolt (forthcoming). With

respect to datasets 3, 4 and 5, we also consulted the original data for supplementary information. As stated earlier, our point of departure was the hypothesis that the growing concern for anthropogenic climate change produced changes in the way energy was domesticated in Norway. When comparing the datasets from the first with those from the second period, we looked particularly for information about how respondents perceived the Norwegian energy situation, how they characterized and reasoned around their consumption of energy – in particular electricity – and how they perceived the need for energy efficiency measures in their own homes.

As we have seen, domestication theory invites a focus on three dimensions: symbolic, practice-based and cognitive. We found these dimensions useful for structuring the presentation and analysis of the findings. However, the cognitive aspects proved to be intertwined with the other two in a way that proved unfruitful to disentangle. Thus, in this paper, we first analyze the symbolic dimensions of the search for changes, before proceeding to examine the extent to which energy practices were transformed. In both sections, we comment on cognitive aspects of the domestication.

The impact of climate concerns: Changes in the symbolic dimension of the domestication of energy

This paper uses domestication theory to study possible transformations of the dominant Norwegian energy culture. This section is mainly concerned with symbolic issues and sense-making with respect to the production and consumption of energy. Did we observe an impact of growing climate change concerns over the two periods? If so, what became different?

According to datasets from the first period, Norwegian consumers' perception of their energy situation unanimously emphasized the plentiful availability of energy and the non-threatening environmental implications of Norwegian energy consumption. The impression of the interviewees was that Norway had nearly infinite sources of clean energy because of the abundance of hydropower.

Thus, energy security or environmental implications of energy use were not issues that preoccupied them in the mid-1990s. One interviewee put it like this: "Don't we have enough energy? It's raining a lot here so that shouldn't be a problem (...). And electrical power is clean and environmentally friendly, isn't it?" (Åshild, 2).

This quote expresses a widely shared sentiment in that time period, which was that Norwegians live in a state of a perpetual energy surplus. This sentiment was voiced across groups of varying social background, attitudes towards energy use and knowledge about energy-related subjects. An elderly man simply stated that: "As far as I can see, the supply of power that we have in Norway makes us very fortunate (...). And I prefer that they develop some more [waterfalls] if there is a need for more electrical power. It is the cleanest energy we can have" (Harald, 2). Or, as a young woman phrased it: "I envision all these rivers, they never stop flowing. Moreover, we sell electricity to other countries (…) I believe we always will have enough energy" (Hanna, 2).

The 1993 survey (dataset 1) did not contain specific questions about the energy situation, but respondents were asked to position themselves in relation to the following statement: "We still have a lot of hydropower in this country that we can upgrade without damage [to nature]." The distribution of answers demonstrates a cautious optimism in relation to hydropower, as almost half of the respondents (47%) agreed (completely or partly), while 25 percent disagreed with the statement. Several of the interviewees in dataset 2 also mentioned that upgrading and maintaining the grid would considerably increase the supply of electricity.

Thus, in the first period (the early 1990s), Norwegians domesticated energy in a way that produced an optimistic and symbolic interpretation of energy – electricity, in particular – as abundant and clean. There were few or no references to climate change or to other environmental issues; such concerns did not motivate respondents to save energy. To the extent that interviewees had

such motivation, this was mainly due to the belief that wasteful behavior is wrong. For some, driving cars was also an issue.

At the turn of the millennium, global warming concerns were increasing. In public discourse, it was argued that consumption of energy, including electricity from hydropower, is a climate mitigation problem. This argument was based on the assumption that renewable hydroelectricity could be exported and, thus, could replace coal power. In this manner, the previously dominant interpretation of energy as abundant and clean was challenged. Did the Norwegian public take this challenge on board and change their symbolic interpretation of energy?

Datasets 3 and 4 show a widespread acknowledgement that human-made climate change is a fact. According to the 2009 survey (dataset 4), nearly 70 percent of the Norwegian adult population agreed that the climate change problem was serious or very serious. The focus group interviews in dataset 3 provide a more nuanced picture, showing how many of the interviewees struggled to make sense of what they considered contradictory pieces of information. The following quote from a woman in her 30s illustrates that the integration of climate change knowledge was not straightforward:

> There are various scientists with different opinions about [climate change] all the time, so then I think that maybe it isn't so bad. It stands to reason that it's pollution and such that make this [global warming], because we haven't had such things on Earth before, but at the same time you think that maybe this is just natural (…). I'm influenced a bit by this latter argument, really; maybe because I want to believe that it's occurring naturally (Thale, 3).

Thus, we cannot assume that the sense-making of energy changed with the introduction of climate change concerns. Although these concerns proved to be debatable, they were still taken on board by many. How did this influence sense-making?

As we have seen, in dataset 2, all interviewees referred to Norway's fortunate situation with respect to energy and said that there was sufficient and clean energy for domestic energy use. The findings from the focus group interviews from the later period (datasets 3 and 5) clearly suggest that a change in attitude had taken place. Over several cold winters, Norway had imported electricity; after this, the country was no longer seen to have abundant clean hydroelectricity. Rather, energy production was considered a cause of environmental problems. As one man expressed:

> In Norway we've been lucky to have hydropower (…). However, now we use more than we manage to produce, which means that we need to get energy from other places, for example (…) be dependent upon the coal power plants in Denmark. Then Denmark will pollute more. We're just pushing the problem ahead of us (Ørjan, 3).

Not everybody agreed with this interpretation: "Energy problems? I don't think so. Yes, we're being told that we have an energy problem but I don't know anybody who has an energy problem" (John, 3). Or, as Kenneth (5) put it: "If we look at the environmental gains of saving electricity (…). Like, the electricity is produced for free here in Norway. It comes out of the waterfalls, which run anyway if the power station is there or not. So how much it impacts the environment, it must be a negligible amount whether you watch TV 20 hours a day, or just 4." Some thought that other energy actions were more pressing than saving electricity: "If you want to be environmentally friendly, I think you should leave your car or (…). There are so many other things you can do instead of turning off the light. Electricity in Norway is already green, we have so much hydropower, but of course you should be conscious about it" (Astrid, 5).

Some interviewees felt that Norway's general level of prosperity and dependence on oil and gas were some of the biggest problems related to climate change. On this basis, they questioned the political will to engage in climate change mitigation. Some also noted a paradox: the authorities aimed for a continued,

large production of oil and gas, while, at the same time, requesting that people save energy, drive less and buy climate quotas when flying. Thus, politicians and public authorities were blamed for the lack of problem-solving action. The moral finger-pointing that was observed was seen as unhelpful. In the focus groups, there were several exchanges over whether one should feel guilty about these problems. Observations of a lack of political will (both nationally and internationally) to solve the problem also fostered a sense of powerlessness among many of the interviewees. The following quote may serve as an example: "The fact that I drive a car to work and back home again, means nothing for the well-being of the globe. I am fed up by everything being pushed down on ordinary people like me – why do we have to save and save and save? And at the same time, other people do as they please" (Knut, 5).

Similar frustration was expressed by a woman who questioned the effect of her individual changes in behavior:

> If I believed that my small screen could contribute to us avoiding the climate changes (…). Because I do believe that something is going on. Something that is not good for us. Right? But, then again I think that one should concentrate on bigger changes regarding other more important areas, before I start using less water in the shower or something like that (Anne, 5).

As we can see, the symbolic domestication of energy during the second period was more complex than that of the first period. More issues had entered the sense-making process of the people interviewed. Climate change had become a prominent topic, and, in the interviews, Norway's import of fossil electricity was observed, while a feeling of powerlessness and critical attitudes towards what was considered political passiveness moderated the effect of these new issues. Apparently, most of the interviewees were aware of the negative environmental effects of energy use – many in the second period even considered "green" hydropower less clean – and many interviewees indicated a guilty conscience when discussing their own energy use. They obviously knew that "something bad

was going on," and they were aware of the link between energy and climate change. It was common for interviewees in this period to report intentions to reduce energy consumption or to claim that such steps had already been taken; this was confirmed by the 2009 survey (dataset 4).

Thus, the emergence of concern over global warming did lead to changes in the symbolic domestication of energy. The perception of Norway as having abundant, clean hydropower – predominant in the first period – was not shared by everybody in the second period. In the symbolic domestication of energy in the second period, energy production and consumption were much more frequently noted as problems that demanded more saving. The previously dominant idea of an "innocent" use of energy was challenged by the perception that energy use, in general, contributes to global warming. In this respect, everyday life served as a basis for critical assessment.

At the same time, there was much frustration over what was considered a lack of realistic options for behavioral change. It was also broadly acknowledged that the lifestyle changes needed for climate change mitigation would be hard to achieve: "If we want to save the environment, we need to lower our consumption. That is painful. I mean, what is more painful: turning off the light or not using your car?" (Astrid, 5). As we have seen, these critical assessments were not shared by everybody. What did this changing, but ambiguous, symbolic domestication of energy mean with regard to energy practices?

The resilience of everyday life routines: Convenience and comfort

Considering the positive assessment of the national energy situation and the few critical remarks about everyday life, it is not surprising that the data from the first period (datasets 1 and 2) shows little concern over the amount of energy used. In addition, since Norwegian electricity was viewed as clean, saving energy was not considered important from an environmental point of view. Accordingly, a main observation is that most of the people who were interviewed expected to

live a fairly comfortable life, which means that they felt they should be able to conduct their daily routines in a convenient manner. They refused to feel bad about this, even if it meant increased energy consumption.

A widespread argument for the acceptability of allowing one's self to spend energy to achieve some pleasures (such as a comfortable indoor temperature in winter and long showers) and, in general, to have a convenient everyday life was as follows: "I consider warm indoor temperature to be, like, an aspect of well-being. I want to allow myself to be comfortable" (Åshild, 2). Or, as Karin (2) put it: "I think one has to allow one-self some privileges. I want my shower in the morning [laughs], and I don't like to be cold."

The survey from the first period (dataset 1) supports this observation. For instance, approximately 70 percent agreed (completely or partly) with the statement: "In our household we use as much energy as we need in order to achieve comfort"; 68 percent agreed with the following: "We are used to unlimited access of heat, light and hot water and energy economizing [energy efficiency measures] must not take these benefits away." Moreover, dataset 2 suggests that changes in everyday life routines were regarded as difficult to achieve without substantial sacrifices. The interviewees were not motivated to take on such disadvantages.

Wasteful behavior was frowned upon, but people were not expected to act thrifty. Rather, comfort and convenience were argued as acceptable goals. Nevertheless, some interviewees expressed a distinct moral obligation to save, but for other reasons: "It has to do with upbringing. We were taught not to make a mess, not to throw garbage around in the nature, to turn off the lights when you left the bathroom and (...) it's not about environmental concerns really, it has to do with being a decent person, I think" (Siri, 2). Or, as stated by an elderly man: "In the old days wasting was culturally and morally reprehensible" (Nils, 2). The main reason offered for saving energy, in the few cases in which this became an issue, was to save money (or to avoid extravagant spending); thus, saving energy was considered an expression of sobriety. Moreover, there was diversity in

respondents' characterizations of what they considered comfortable. For example, some interviewees considered a relatively low indoor temperature comfortable.

As we have seen, in the face of concerns over global warming, the energy situation was assessed less positively in the second period. More people in this period expressed critical views of their energy domestication, even if these attitudes were not shared by all interviewees. This could also have produced changes with respect to the actual consumption of energy. To some extent, we found indications of a change in the Norwegian energy culture over these two time periods, with respect to practice. In the 2009 survey (dataset 4), many of the respondents (60 percent) claimed to have changed their way of living as a result of the climate problem. When asked what they had changed, the most common responses related to reduced energy consumption (50 percent), recycling (39 percent) and more frequent use of public transport (29 percent).

However, the results from the focus group interviews (datasets 3 and 5) suggest that such changes were fairly moderate and did not really alter the way people chose to organize their everyday lives. Demand for a comfortable indoor temperature and fairly unrestricted use of hot water and high expectations for the standard and size of dwellings was strikingly parallel to what was found in the dataset from the 1990s. Still, many of the interviewees in the second time period expressed frustration with respect to transforming their everyday lives in ways that would lead them to use less energy. Why were lifestyle changes considered so difficult?

A fairly typical response to questions relating to climate change mitigation behavior was the following: "[I can do] little things. Things that do not take too much time. Everyday life is so busy, and if it becomes a large project, then it's probably not so many that are willing to make the effort. If small actions may contribute, then one can take part in it" (Tanja, 3). Family life was thought to limit the possibilities for changed energy practices, due to time issues: "I have three small children from six years old and younger, so we use the energy we

need, to put it that way. We constantly have to wash and dry clothes, but of course we turn off the lights and try to keep it low, but, you know …" (Ola, 5). Thus, an important issue was the necessity for carrying out everyday life routines in a satisfactory way, with respect to effort and outcome. Interviewees expected to be able to lead a comfortable life; thus, they believed that they should be able to conduct their routines in a convenient way. This attitude made their everyday lives fairly resilient to changes motivated by energy efficiency.

It is important to note that this resilience was not considered unproblematic. A fairly common point of view admitted a difference between acknowledging the need to do something and actually making an effort: "My husband and I talk about that, idealistically, we should be more conscious about our energy consumption, but in practice we don't do anything, we just talk about it. Nothing happens, at least when it comes to energy usage in our house. Maybe we consider energy or the environment more in other situations, I don't know" (Annika, 5). In other words, the data from the second period suggests that the interviewees knew that they ought to save energy in order to save the planet. Often, they expressed a guilty conscience:

> I feel that I'm morally committed to be considering environmental issues, and if I do things that I know I shouldn't do, actions that are wasteful, I think about it. I get a guilty conscience if I, for instance, travel by air instead of taking the train, or if I take the car when I really should walk. At least I think about it. And I guess that's better than not thinking about it, at all. Although, of course, I should've changed my practice in reality (Lise, 5).

In the first period, comfort and convenience were assumed to be things people deserved. In the second period, however, comfort and convenience came with the cost of guilt; they were no longer thought to be unequivocally deserved, but, rather, seen as necessary for everyday life.

Feelings of bad conscience were, to some extent, moderated by other arguments. First, as we have seen, many did not see the situation as sufficiently serious to merit concerted action. Second, it was common for participants in the focus group interviews to argue that policy-makers and industry, rather than ordinary people, should be at the forefront of mitigation efforts. Many so-to-speak externalized the responsibility to act – with respect to saving energy, for example. Third, climate change issues were perceived as remote from everyday life concerns and less pressing than other problems.

Some also pointed towards what they saw as inconsistencies in social developments. For example, the increasing availability of cheap air tickets and the support of motor sports were seen to be inconsistent with messages from climate scientists and politicians about the seriousness of climate change. John (3) argued that:

> I think that most people try to do their best, but the current situation doesn't always make this easy. With the cheap plane tickets and everything (…). I can take the bicycle to work and to the kindergarten if I want to, you know. But consider such banal issues as the emergence of cut-rate airlines for example, but they shut down the night train between Oslo and Stockholm, a number of such obvious issues – where there're no alternatives to CO_2-emissions.

The resilience of everyday life with respect to comfort and convenience was, however, justified in the focus group interviews through frequent complaints that it was difficult to know what to do: "I think we have had enough information about the fact that there is a crisis and that the Earth is in trouble, but there is not enough information about what *you* can do" (Katrin, 3). There was also a widespread feeling of powerlessness in the face of what were considered insurmountable challenges, and this sense of powerlessness was used as an excuse for respondents to continue their ways of life. Others stated

more bluntly: “I don’t think any of us around this table are willing to reduce our standard of living” (Eskild, 3).

In the final instance, domesticating energy in the face of global warming in order to change consumption practices was argued to be difficult, because everyday life routines were contained by expectations of comfort and convenience, which few were willing to reduce. Reduced energy consumption – except when such savings could be easily achieved – appeared to be dissonant with the established everyday lifestyles of the people interviewed. Still, acknowledgement of human-made global warming made many admit that they ought to implement more wide-ranging changes. This offered challenges with respect to the production of a self-respecting assessment of one’s everyday life, which was met by the kind of arguments we have seen above. In addition, many voiced the concern that there should be a fair distribution of benefits and strains with respect to climate change mitigation and energy use. Social justice was emphasized with respect to some mitigation initiatives, and a perceived lack of fairness was provided as an excuse for inactivity. In such ways, the resilience of everyday life was made into a political issue.

Conclusion: Changed meaning, resilient practice

We began by asking if the widespread acknowledgement of human-made global warming that occurred in the last decade or so changed the domestication of energy. To provide an answer, we re-analyzed studies of the Norwegian energy culture that were conducted between 1991 and 1995, and 2006 and 2009. First, we studied the symbolic, sense-making aspects of energy, as accounted for by the interviewees. In doing so, we observed a quite marked change over the two periods. In the first period, energy use was largely not seen as a problem. Norway was considered rich in energy resources, not the least with respect to clean hydroelectricity. Those who thought that energy saving was important did so mainly because they were concerned over waste. Climate change issues were barely mentioned. To the extent that environmental issues were brought

forward, these pertained to local pollution from traffic and reflections on the use of cars.

As expected, this attitude had changed by the second period, when concerns over climate change had become much more prominent. In addition, Norway had begun to import electricity on a substantial scale, which meant that electricity could no longer be considered unambiguously clean. Many seemed to know about this import; thus, energy consumption was rendered more problematic. Furthermore, it was acknowledged that electricity savings might lead to the export of clean energy to replace the fossil production of electric power. In both of the focus group studies in the second period, there was much more discussion of the sense-making of energy than in the interview study in the first period. Many, but not all, were more concerned. Rather than claiming that there was a widespread acceptance of energy saving and energy efficiency as important household tasks, we conclude that energy consumption, above all, had become more a matter of concern by the second period, relative to the first period we studied.

However, a complete transformation with respect to the way energy use was considered had not occurred. This was due to several moderating influences on people's accounts of the need to act. First, there was fairly widespread reservation with respect to the seriousness of the climate change challenges. Second, there were critical observations about a lack of political engagement. Third, and related, the responsibility to act was externalized. Fourth, there was frustration regarding what were considered unrealistic options for changing everyday life activities. These moderating influences also created considerable diversity in the sense-making of energy consumption, which provided ambiguity with respect to the felt need for changes in energy consumption practices.

Thus, unsurprisingly, sense-making of climate change knowledge in a way that affected the domestication of energy had only occurred on a fairly modest scale. The observed accounts suggest considerable resilience of everyday life in this respect. We found few, if any, reports of radical changes in the organization of

everyday life. However, many did what they considered "small acts," such as recycling, saving electricity when it was easy to do so and reducing driving. "Small acts" were considered doable, while more comprehensive transformations were seen as too burdensome to undertake – at least when they were rendered as individual responsibilities. In many cases, doubts prevailed over whether ordinary people could do anything to effectively mitigate climate change.

Previous studies have identified the dominant position of energy cultures that privileges comfort and convenience (Aune 1998, 2007; Shove 2003). Since energy cultures have been shown to be solidly embedded in everyday life practices, they have also been considered robust and fairly resistant to change. The findings in this paper support these observations, although with some reserve. The increased focus on climate change in public discourse clearly had an impact on sense-making with respect to energy, and led to greater ambiguity and more concerns. The effect on households' energy practices was more modest, but it is nevertheless important to emphasize that many people in the second time period claimed to have made changes in their energy-related practices (dataset 4). Since comprehensive transformations take time, it is possible that, in the future, climate change mitigation may have a much larger effect on the domestication of energy, with respect to both symbolic and practice-based aspects.

However, much of the evidence presented in this paper cautions against such optimism. The four moderating influences listed above reduced the motivation offered by global warming for households to change the way they domesticated energy. Unless political measures (such as granting social justice by making changes mandatory) are implemented to reduce the effect of these moderating influences, concerns over sustained comfort and convenience in everyday life will continue to conserve the present energy culture.

We have seen that increased emphasis on the need for climate change mitigation produced a widespread, but not necessarily strong, feeling of guilt with respect

to energy consumption. Energy consumption became concerned. Guilt may have motivated some changes in practice, but it was not very effective for making new practices. Thus, what we observed is that concerned consumption took place in an otherwise stable comfort- and convenience-oriented energy culture, and the transformation of concerned consumption into sustainable practice was seen to demand concerted political action that provided for social justice with respect to climate change mitigation.

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The Ethos of Energy Efficiency

Åsne L. Godbolt

Abstract

This paper analyzes the moral aspects of household energy use and energy efficiency, and introduces the concept of the ethos of energy efficiency. Based on focus group interviews and domestication theory (Sørensen et al. 2000; Sørensen 2006), it examines how consumers make sense of energy efficiency issues. Rather than focusing on economic concerns, the interviewees framed matters of energy consumption and energy efficiency in terms of moral considerations. Four partly conflicting moral positions were identified as being constitutive of the ethos of energy efficiency: saving, merit, needs, and entitlement. These moralities provided the interviewees with arguments related to their decisions on energy consumption and efficiency. Arguments were made subject to moral calculations, through which the four moral positions were seen to moderate each other.

Keywords: *Energy efficiency, households, energy use, domestication, moral arguments*

Introduction

Energy efficiency has been a long-standing political challenge, because it has proved difficult to realize the potential of energy savings in most areas of society. In OECD (Organisation for Economic Co-operation and Development) nations, a main focus has been on increasing the energy efficiency of buildings, vehicles, appliances, and industrial operations (Geller et al. 2006). Less attention has been given to the ways in which households consider their energy consumption and how they may be motivated to spend less. Commonly, policymakers have framed this as a primarily economic issue. However, social scientists have shown that

such a framing is too narrow (Lutzenhiser 1988; Aune 1998, 2007; Shove 2012, 2003a, 2003b).

Building on these and other contributions, this paper analyzes the considerations people present when they are asked to account for how they use energy in their homes, with energy efficiency presented as a backdrop. How do they navigate different concerns, such as cost and comfort, when confronted with expectations of increased energy efficiency in their households? How do people explain their actions with respect to engaging (or not engaging) in energy efficiency measures in their homes? This paper maps and discusses the arguments that people draw upon when providing such accounts. In turn, this paper may improve the effectiveness of policy measures designed to motivate energy efficiency in households.

The analysis is based on a series of focus group interviews that were conducted in Norway. The Norwegian context is interesting with respect to the concerns raised in this paper. Norway is a small country, affluent in energy but with fairly long, cold and dark winters. Relatively cheap hydropower electricity is used for heating, and this energy is considered environmentally friendly. Furthermore, Norway is a large exporter of oil and gas, which is of great economic importance. Norwegian energy efficiency policy has been dominated by an approach emphasizing economic, rather than technical, efficiency (Karlstrøm 2012). Moreover, this has spilled into policymaking with respect to households, in which people have been expected to consider their energy use in economic terms and to be motivated to save money through energy savings. In this way, energy efficiency has primarily been considered a behavior that should be managed through economic rationality.

This predominantly economic frame is reflected in the label "energy economisation" (ENØK), the main term used to characterise Norwegian energy efficiency policies and activities (Sørensen 2007; Sørensen and Ryghaug 2009). Energy economisation is primarily based on the idea that energy should be used in an economically optimal way. This idea has resulted in a governmental policy

proposing primarily economic incentives, including information, to instigate energy efficient behavior. This policy is also proposed as a strategy for relevant actors (e.g., within the building industry) to increase energy efficiency within their domains (Sørensen and Ryghaug 2009). However, the effects of energy economisation policies have, at best, remained unclear.

Moreover, Norwegian policymakers have, over a long period of time, presented contradictory beliefs about the rationales underlying household energy consumption – particularly in relation to electricity (Karlstrøm 2012). This has provided an ambiguous context for individuals reflecting on their energy habits. The most common assumption among policymakers has been the fairly simplistic idea that households reduce their electricity consumption when prices increase. However, in political debates, household consumers have been argued to have knowledge and moral deficits. The assumption of a knowledge deficit has been used to explain why price incentives may not work, since consumers are believed to know too little about energy efficiency and the electricity market to interpret prices in the way that policymakers would expect. The moral deficit argument emerges from policymakers' belief that many households waste energy.

More recently, policymakers have begun to perceive household consumers as potential *investors* in energy efficiency. The driving forces behind such investments, it is argued, may be electricity cost considerations, but also policy instruments like subsidies, information and demonstration projects (Karlstrøm, Sørensen and Godbolt 2009). Thus, the context of households' sense-making with respect to their energy use – in particular electricity – contains partly contradictory ideas about households being price-conscious, uninformed, wasteful and investment-oriented.

This paper explores such sense-making through the concept of ethos. Ethos refers to a set of guiding beliefs or values. I identify and analyze important elements of the ethos of energy efficiency by studying accounts of energy use and energy efficiency concerns. Making sense of energy efficiency means engaging

with the economic effects of energy efficiency practices and technologies, as well as the knowledge of such technologies. Moreover, people are faced with a continuous public debate over climate change.

The resulting ethos of energy efficiency does not need to be consistent or free of contradictions. Rather, we should expect the ethos to make different kinds of action sensible. Thus, people need to navigate potentially conflicting beliefs and values in their enactment of energy efficiency. How should we analyze and understand such processes?

Making sense of energy efficiency: Knowledge, meaning and practice

While energy efficiency has been achieved through stricter building codes and improved houses, consumer energy behavior has proved more difficult to change in the same direction. Hence, to gain a more comprehensive picture of energy consumption and everyday life, we must study the social and cultural dimensions of energy use (Aune 2007; Aune and Sørensen 2007; Shove 2012, 2003). What is involved in such concerns?

According to Owens and Driffill (2008), energy behavior is influenced in complex ways by factors such as price, awareness, commitment and trust, including a sense of moral obligation. For instance, the fact that individuals' pro-environmental attitudes rarely result in significant shifts in behavior, or that these attitudes are apparently inconsistent, should not come as a surprise (although this is often offered as a paradox). Also, the enactment of routine habits, cultural norms, practices, social networks and fashion must be assumed to influence energy consumption. This includes the dynamic interplay of human agents and technologies in socio-technical systems that structure patterns of energy consumption in everyday life. Social scientists have framed energy use as a choice shaped by dominant conceptions of comfort, cleanliness and convenience, which are embedded into the built environment (Aune and Sørensen 2007; Shove 2003a; Shove 2003b).

Social science research on energy consumption and energy behavior offers different ways of understanding and conceptualizing energy efficiency as a social issue. In contrast to findings from economics and environmental psychology, insights from the social sciences show that energy demand is not only an individual construct, but also a social construct, in that institutional and cultural contexts influence energy behavior and attitudes. More recently, an alternative set of social science approaches has emerged. These approaches can be categorized according to the ways in which they frame energy efficiency, and include:

- the economic sociology frame, which focuses on investigating actual economic behavior and analyzing empirical settings to understand energy use and choice, in order to reveal the complexity of the social nature of "economic" behavior (Biggart and Lutzenhiser 2007; Ek and Söderholm 2008, 2010; Thøgersen et al. 2010; Winther and Ericson 2013);

- the community frame, which presents low-carbon communities as a potential solution for four persistent problems in energy demand-side management: social dilemmas, social conventions, shared infrastructures and the helplessness of individuals when faced with the enormity of climate change (Aall et al. 2007; Barr and Gilg 2006; Heiskanen et al. 2010);

- a frame focusing on technology, innovation and (lack of) communication, which claims that energy inefficiency is mainly due to the communication gap between experts and laypeople, with experts seen as failing to understand why households behave "irrationally," because they fail to grasp consumers' logic of energy use (Heiskanen and Lavio 2010; Hyysalo et al. 2013; Palm 2013);

- a frame emphasizing the role of barriers and re-defining how barriers should be categorized, which may lead to new suggestions for addressing

the energy efficiency gap and to different policy recommendations (Abrahamse et al. 2005; Carlsson-Kanyama and Lindén 2007; Slocum 2004; Thollander et al. 2010; Throne-Holst et al. 2007; Vringer et al. 2007); and

- the energy culture frame, which, through a critique of a strictly rational economic view of the consumer, analyzes many factors that shape energy consumption patterns (e.g., values, activities, technologies, habits, etc.) (Aune 2007; Gram-Hanssen 2010; Stephenson et al. 2010; Young and Middlemiss 2011).

This paper draws primarily on the latter frame, but focuses, in particular, on sense-making processes. The energy culture frame suggests that consumer energy behavior can be understood at its most fundamental level by examining the interactions between cognitive norms (e.g., beliefs, understandings), material culture (e.g., technologies, building forms) and energy practices (e.g., activities, processes). These three core concepts are highly interactive, and are also linked to an outer ring of wider systematic influences on behavior (also referred to as the "contextual soup"). Furthermore, the framework is change-oriented rather than deterministic: "wider social, environmental and economic forces *structure* but do not *determine* people's cognitive norms, practices and material cultures" (Stephenson et al. 2010: 6127). This interdisciplinary framework is designed to identify clusters of "energy cultures" – similar patterns of norms, practices and/or material culture – as a tool for understanding the potential and possibility for sites of action to achieve behavioral change.

Like Stephenson et al. (2010), Aune (1998) categorizes the variation in energy consumers' behavior, attitudes and material environment as different "energy cultures." This paper aims to dig deeper into the rationalities and norms that help shape energy cultures, and hence to influence the enactment of energy efficiency. It studies consumers' ongoing negotiations over everyday life, energy consumption and climate concerns, to provide more information on what I have chosen to label the "ethos" of energy efficiency. This ethos is the set of shared

values, norms and beliefs that guide energy use in a given context, and represents a sense-making resource with respect to the economic incentives, information and instruments used to make households more energy efficient.

The ethos is studied through the use of domestication theory (Sørensen et al. 2000; Sørensen 2006). This user-centered perspective helps to clarify how knowledge and information are selected, transformed and, eventually, used in people's everyday lives (Sørensen et al. 2000). Moreover, it allows for clarification of the beliefs and values involved in this process. Analyzing the domestication of the hybrid of technologies and knowledge that constitutes energy efficiency issues means studying the development of practices, the construction of meaning and the processes of learning with respect to the area or object of concern (Sørensen et al. 2000; Sørensen 2006). In order to be appropriated, energy efficiency issues (including policy) must be given meaning, understood or learned and acted upon, either positively or negatively (Aune et al. 2011).

It should be assumed that the ethos of energy efficiency guides the processes of domestication. When people account for their symbolic, cognitive and practical domestication of energy, they implicitly describe the ethos of energy efficiency through the arguments they use to explain how they manage energy efficiency issues. Four issues emerged as prominent in interviewees' domestication accounts:

- the role of electricity prices;
- investments in energy efficiency;
- knowledge of energy efficiency; and
- the explicit role of values and beliefs in accounting for energy consumption and energy efficiency measures in the household.

The analysis is structured by pursuing these issues consequently, in order to identify elements of the ethos of energy efficiency.

Method: Focus group interviews

This paper is based on nine focus group interviews with 44 participants (19 women and 25 men), conducted in 2009. The interviewees differed in terms of age, education and work experience. There was also considerable variation in political views and knowledge of and attitudes towards energy efficiency and consumption. An important goal of researchers with focus group interviews is to get closer to interviewees' understandings of the topic of interest by observing verbal exchanges within the group (Morgan 1997; Stewart et al. 2007). Since accounts and opinions are produced and clarified throughout interviewee interactions, focus group interviewing is a well-suited qualitative method for exploring attitudes and concerns. The participants in the interviews were not statistically representative of the Norwegian population, but they provided considerable diversity with respect to age, gender, occupation and geographic belonging. They were recruited through existing social networks and discovered through snowballing (Morgan 1997; Stewart et al. 2007). The interviews took place at familiar locations, such as interviewee workplaces and homes.

Since the purpose of the focus group interview was to learn about participants' experiences with and perspectives on energy efficiency and energy use, I used a semi-structured interview guide that accommodated participants' own input (Morgan 1997). My role as a moderator was to manage the discussions, follow up on interesting points and see that everybody had a say. The main topics in the interview guide were the participants' everyday energy use, their efforts to increase energy efficiency and their understanding and opinions of energy policy and the energy market. The interviews lasted for approximately one and a half hours, and they were taped and transcribed verbatim. Here, interviewees are referred to with fictive names so their anonymity is preserved. The data analysis was inspired by grounded theory (Strauss and Corbin 1998). I examined the interviews for categories, which were each given a label or a code; I then grouped these codes to find related sub-categories that might be linked to more

comprehensive categories. How did the interviewees make sense of energy efficiency?

Domesticating energy efficiency

As noted previously, the analysis is structured around four issues: (1) price, (2) investment thinking, (3) knowledge and (4) explicitly expressed values and beliefs. The dominant role of the economics of energy efficiency in policy accounts makes the issue of price a good place to start. How, and to what extent, were economic arguments invoked in discussions of energy use and energy efficiency?

Price consciousness

To begin, although many of the interviewees argued that the economic benefits of saving energy were too small, they were still concerned with their electricity bill. Several interviewees said that keeping their bill down was their main motivation for saving electricity. So, did they? Their responses were ambiguous. The cost-oriented interviewees said that they tried to save electricity to save money, but admitted that they used all of the energy they needed to make their everyday lives comfortable. Some complained about high prices, while others did not think that they paid too much for their electricity or were less concerned with price. Thus, price consciousness – to the extent that it was articulated – was primarily an awareness of price levels and not necessarily focused on reducing consumption when prices rose.

Nevertheless, some interviewees were concerned with the graphical information in their bill that compared their current level of consumption with that of the previous year. This graph motivated them to be concerned about their electricity consumption:

> Else: When I get the bill, there are some sort of graphs that say "now you have used this much more than last time" and then I think; okay – I need to try to limit myself a little (…)
>
> Int.: So, when you get those graphs and information about how much you have used compared to last year?
>
> Else: Yes, it works for me. Because I am not going to remember how much money I paid last year, but I look at… I mean, I see that it is more or less than last time, kind of… (laughter) (…) If I see that it has increased, then I try to use less electricity, but then I forget it again… So, I do not know.
>
> Ingrid: I am like that too. Every time I see those graphs it is like, "Oops, I have used more than last year."

Else and Ingrid claimed to be concerned with the graphs on the electricity bill, and said that these graphs helped them keep track of their electricity consumption. However, this was not necessarily translated into electricity savings. It seemed that saving money was not so important as feeling that consumption was under control and not increasing.

The interviewees claimed to be intent on engaging with energy efficiency, but the possibility of saving money in this way was not emphasized. Like Else, they either forgot how much money they paid for their electricity or did not consider energy costs sufficient for changing their energy habits. They could afford to buy the electricity they needed to maintain a comfortable lifestyle, but this did not mean that they wasted energy. Many of the interviewees stressed that people should not waste energy – expressing a symbolic dimension of energy efficiency wherein moral reasoning was more outspoken than economic concerns.

This ambiguous domestication of energy efficiency may have been due to the relative affluence of the interviewees, but previous studies suggest that this

pattern of ambiguity has been quite stable in Norway over several decades (Aune 1998; Godbolt et al. forthcoming). We also know that the consumption of electricity in Norwegian households has increased only a little since 1990, and has been relatively unaffected by population growth and the steep increase in household income (Hille et al. 2011). Could this be a result of a public interest in investing in energy efficiency technologies?

Investment orientation

As discussed above, the price of electricity did not provide sufficient motivation for interviewees to change their everyday lives to save energy. According to the interviewees, the price of electricity did not provide much motivation for investment in energy efficiency technologies, either. Still, Norwegian households invest considerable amounts in refurbishing their homes, which contributes substantially to energy efficiency (Hille et al. 2011). What drives this activity?

Shove (2003a) argues that expectations of comfort, cleanliness and convenience influence consumption patterns, and this is also relevant to the use of energy. Especially in relation to investment in sustainable heating, the data indicate an orientation towards convenience and comfort. The interviewees who claimed to have invested in new, more sustainable heating technologies (mostly air-to-air heat pumps) were well-established families. Their motive for this investment was not reduced energy consumption, but better and more stable heating. Some appreciated the lower electricity bill that the heat pump could provide, but a more comfortable lifestyle was their main motivation for engaging with this effort of energy efficiency.

However, economic considerations were important when explaining the decision *not* to invest in energy-saving technologies. Typically, the young and the elderly interviewees said that they were not in a position to invest in such equipment, because it was expensive. Younger interviewees, between 25 and 35 years old, also claimed that they would not benefit from such an investment because they

would most likely move in a matter of years. Also, those of 65 years and older thought they might move or even die before the investment paid off. These economic arguments probably served as an excuse for not doing anything, even if the investment would have likely been profitable.

Apparently, the interviewees had not domesticated energy policy to the extent that their investments in improving energy efficiency were motivated by political or economic concerns. Increased comfort was what they wished to achieve through investment in energy-saving technology. Did they lack knowledge?

Knowledge

A main effort to make Norwegian households more energy efficient has been led by public information campaigns (Sørensen 2007). Still, policymakers suspect that a lack of knowledge explains the public lack of engagement with energy efficiency (Karlstrøm 2012). However, people tend to interpret knowledge in ways that fit their everyday life choices (Irwin and Michael 2003). This is no different in relation to energy efficiency. My interviewees claimed to engage in energy saving behaviors that were convenient for them, such as turning off lights, using an energy-saving shower head, filling up the dishwasher, recycling garbage and lowering the indoor temperature. If changes involved hard work or were time consuming (such as hanging up clothes to dry instead of using a tumble dryer), they did not do it.

Clearly, such accounts of enacting energy efficiency reflect an emphasis on convenience, wherein people choose the energy efficiency efforts that fit their everyday lives. Still, the interviews showed that, by and large, they had domesticated energy efficiency with respect to symbolic content. They knew that they were supposed to save energy for economic and environmental reasons. However, many interviewees said that they had trouble figuring out how to save energy in a substantial way:

> Fredrik: Individually, the way we live our lives? Well, it is there all the time... saving electricity, saving gas, saving this and that. Take the bus...
>
> Lars: But to really understand, you need to look up these things yourself (…). I do not feel that we get any information by anyone, especially not by the politicians. Maybe it is not their job either.
>
> Int.: Is it difficult to understand why you are supposed to *act* like you do?
>
> Fredrik: No, more the technical part. Like, what are the right things to do? You hear about it through the media, but still...

The interviewees agreed about minor issues – for instance, that energy-saving light bulbs are more efficient than regular light bulbs. However, they found it more difficult to determine the smartest way to save electricity through one's choice of heating systems. Often, interviewees in the focus groups would continue to discuss the degree to which different options, such as lowering the indoor temperature, would actually save electricity, given that a cold house had to be re-heated. Moreover, there were moral disagreements between interviewees. In the exchange below, Mari suggests that the smartest way to save electricity is to reduce the indoor temperature. She is countered by Hans:

> Mari: The best way to save electricity is to lower the indoor temperature with two or three degrees. (…) Here in Norway (…) it is like a sauna indoors compared to other countries. In Chile in South America, it was very cold inside although it is a warm country. That made us think about these issues in another way (…). We have a "comfortable" indoor temperature that I'm sure we can reduce a couple of degrees.

> Hans: But isn't that because – I mean, here it is so cold outside, that we have to go inside to get warm (…). They [people in South America] go inside to cool themselves.
>
> Mari: Yes, but we walk around like this [pointing to herself wearing a T-shirt]. It is not comfortable for us if we have to wear a sweater, or wear socks or something like that. So, that is a comfort zone for us – we prefer to have a tropical temperature inside our houses.

As we can see, moral issues concerning comfort and convenience arose in discussions of how energy efficiency should be enacted in everyday life. Mari criticized Norwegians for not being willing to reduce their levels of comfort, while Hans argued that Norwegians had a right to enjoy high indoor temperatures because of the cold climate. This suggests that values are more important than knowledge in the domestication of energy efficiency.

Values and beliefs

As we have seen, economic considerations and a lack of information, to some extent, influence the (lack of) domestication of energy and energy efficiency. However, in the analysis of the interviews, the prominence of moral arguments quickly became evident. Moral considerations appeared to be more prominent and more important with respect to the outcome of domestication. What was included in the moral exchanges in the focus groups?

To begin, moral arguments were widely used to explain and defend comfortable lifestyles; for example, the argument was made that living in a cold country gives one the right to use more energy. The fact that Norway's electricity comes from clean hydropower was also invoked as a reason for not saving energy. Some interviewees claimed not to understand why they should reduce their consumption of electricity because of environmental concerns, since

hydropower is "green and clean." Other actions were deemed more appropriate: "Don't use your car, or… There are plenty of other things we can do instead of turning off the lights. I mean, the electricity in Norway is already sustainable – there is so much hydro power" (Astrid).

There were, as already discussed, some elements of thriftiness in the moral deliberations that took place in the focus group interviews. However, these were mainly voiced as wishes to avoid further increases in energy use. First and foremost, other moral concerns were articulated. For example, Hans argued in the quoted discussion above that Norwegians have a right to consume electricity because of the country's cold climate. Astrid said that consumption of electricity is unproblematic because, in Norway, electrical power is green; she also argued that people should engage in other environmentally friendly activities. Rather than interpreting this situation as indicative of a moral deficit, it would seem more appropriate to see it as an expression of moral surplus.

This would be in accordance with Owens and Driffill's (2008) observation that energy attitudes and behavior are influenced in complex ways by factors such as commitment, trust and moral obligation. Typically, the interviewees said it was important to them to feel certain that their efforts made a difference in a larger context. They also claimed to feel a moral obligation to contribute to a greener future. On the other hand, interviewees' engagement with energy efficiency seemed restricted by a sense of the futility of individual action; this is similar to observations in other studies (e.g., Levin 2003; Ryghaug et al. 2011; Ryghaug and Næss 2012). The more the interviewees understood the complexity and challenges of the global energy problem, the more powerless they felt: "What does it matter what I do in my own home as long as the Norwegian government keeps on pumping up all that oil?" If there was a moral deficit, this was placed with other actors, such as politicians and industry agents, who were felt to fail to enact climate change mitigation and to solve other environmental problems related to energy.

Thus, consideration of economic and knowledge aspects of energy use and energy efficiency were moderated by partly conflicting moral issues, indicating the importance of the energy efficiency ethos with respect to the ways in which domestication is enacted. What elements are included in this ethos, and how should it be characterized?

Navigating the ethos of energy efficiency: Dealing with moralities

To begin, it should be noted that it seemed crucial to the interviewees to be seen as recognizing the importance of energy efficiency in their everyday lives. One way of expressing this was by arguing that energy saving is important for economic, as well as environmental, reasons. We may interpret this as a *morality of saving*, emphasizing thriftiness, but it was moderated by interviewees' claims that they had to use the energy they needed. They were quite aware of the environmental consequences of their actions, and some expressed guiltiness relating to (for example) traveling by airplane or driving a car too often. The resulting ambiguity is nicely illustrated by the following exchange, in which we learn how energy use reflects old habits more than new knowledge or moral engagement with these issues:

> Fredrik: I do not reflect very much upon my energy use. I guess it is more about the habits you are used to – if you are an energy saver or not. And in that case, there is a lot of room for improvement.
>
> Int.: What do you mean by that?
>
> Fredrik: I could probably take quicker showers and turn off the lights, and all that.
>
> Lisa: No, my luxury is to shower as long as I want. No saving shower – as much water as possible! When I brush my teeth, I try

> not to let the water run too long, and I turn off the lights and that kind of stuff. That is my small contribution. So, I guess I can shower as long as I want to... (laughter).

Clearly, Fredrik and Lisa knew what would be a politically or morally correct practice. The morality of saving was definitely present in their discussion. Fredrik, for instance, admitted that his energy practices would be better if he were to decide to put some effort into them. Thus, he had domesticated energy efficiency symbolically and cognitively, but less so practically. Further, the morality of saving was moderated by a *morality of merit*, clearly expressed by Lisa, above. Efforts to save energy in some areas were seen to merit relative wastefulness in others; this is sometimes referred to as a rebound effect. Some interviewees who engaged in climate issues defended their actions in a similar way. For instance, the following argument was used: because I don't drive a car (which the interviewees seemed to perceive as the worst thing to do), I deserve to take some liberties in other areas of energy use.

Another set of arguments was based on a *morality of needs*. Many interviewees claimed that they lacked the option to save energy – that they had to use whatever energy they were currently using in order to manage their everyday lives. For example, clothes needed to be washed and dried, dishwashers were constantly full, houses had to be heated and cars were irreplaceable. Several interviewees blamed their kids for their households' high consumption of energy: the kids showered too much, they wore their clothes only once before laundering them and they had to be driven to school and leisure activities several times a day. Through these arguments, children provided justification for interviewees' high energy consumption.

A key issue, of course, is how "necessary" is defined in the context of energy abundance and relative affluence. For the interviewees, this seemed to hinge on a balance between sobriety and luxury in everyday life. Like Lisa in the previous quote, many interviewees felt that they needed and deserved some energy luxury in their lives; they accessed this luxury through things like long showers

and warm indoor temperatures. Green habits were used to justify not so green habits in other areas. In addition, some felt that they had a natural right to use all of the energy they needed to enjoy everyday life without having to justify their energy practices. This latter group expressed a *morality of entitlement*, believing that access to plentiful energy is a self-evident privilege.

In part, the morality of entitlement was linked to modernity. Interviewees expressing this morality believed that modern societies ought to be able to produce a sufficient amount of sustainable energy. Consider the following exchange:

> Erik: But according to what I can do here in my house (…) I would like to have a solar panel and be sort of self-sufficient. Yes, I like that idea. There is a lot of idealism in that, I believe. But, I am still not concerned about saving electricity. I am into *making* electricity (…). When I cannot do it, I will use whatever I need. Whether it is made here or not. We use whatever is necessary. According to our needs.
>
> Richard: Yes, but I believe that we are talking about saving energy, not consuming it. It is like, the energy needs to be saved, and that gives an economic benefit.
>
> Int.: Yes, you believe that people should save energy, right?
>
> Richard: Yes, and by that I mean that you don't necessarily need to make things that use more energy, although they might be sustainable.
>
> Erik: I totally disagree with you on that.
>
> Richard: Yes, yes, no, because if you look at the consumption of energy – that is what is the problem. You use more than you need.

> Erik: Well, the goal is that everybody gets the opportunity to use the amount of electricity or energy they need, but the challenge is that you then need to produce that energy in sustainable ways. And use alternative methods, and there we are… We have come a long way, and—

In the above discussion, Richard clearly represents a morality of saving; for him, energy efficiency is about using less. Erik, in contrast, argues from a morality of needs, but also from a morality of entitlement perspective. He believes that modern societies ought to provide sustainable energy in sufficient quantities, and that this should be the main energy challenge. The exchange between Erik and Richard points toward another crucial and contested issue concerning energy efficiency and sustainability: Who is responsible for solving these problems? Some of my interviewees suggested that Norwegian consumers should take extra responsibility and set a good example for the rest of the world, because Norwegians have the resources to do so. Other interviewees, as we have seen, found it hard to understand why Norwegian consumers should lower their energy use, since most energy used in households is provided by renewable hydroelectric power.

In addition, the issue of responsibility raised a question about which actors should take the lead. Several of my interviewees felt that it would be unfair to make demands on regular people who only use the energy they need to manage their everyday lives. The following dialogue highlights this issue:

> Knut: The fact that I drive a car to work and back home again, means nothing for the well-being of the globe. I am fed up by everything being pushed down on ordinary people like me – why do we have to save and save and save? And at the same time, other people do as they please.
>
> Int.: When you say other people...

> Knut: Then I think of industry for example. The Americans spew out crazy amounts, the Chinese, the Indians do it... What we do in this small city means nothing.
>
> Julie: But if everybody thinks like that – as long as everybody else does it, I can do it too... I think that we have to turn around and start with ourselves. That is the easiest thing to do. It is a lot harder to change other people. (...)
>
> Knut: But the demands are always made on us as individuals, and in a global context I do not believe in that.

According to Knut and several other interviewees, personal practices do not matter in the larger context. These interviewees felt that possible contributions, such as turning off lights or using an energy-saving showerhead (etc.), do not really help. This *morality of externalized responsibility* was usually expressed through feelings of frustration and powerlessness. Julie, in the exchange above, voices a *morality of internalized responsibility*, and argues that everybody is obliged to do what they can to help solve the problem. She and other interviewees argued that it is easier for people to change their individual habits than to improve the energy practices of actors such as large industrial companies.

To summarize, we have observed four main moral positions with respect to energy efficiency: (1) the morality of saving, (2) the morality of merit, (3) the morality of needs and (4) the morality of entitlement. In addition, with respect to the responsibility of enacting energy efficiency, we saw external as well as internal placement. Thus, the ethos of energy efficiency consists of four sets of moral arguments and two opposing positions with respect to the responsibility for action. How did this translate into domestication?

Ethos and actions

Adherence to the morality of saving tended to mainly produce feelings of guilt among the interviewees, because of their failure to reduce energy consumption. Seemingly, more women than men struggled with such guilty consciences. Several of the interviewed men were reluctant to believe that their energy practices made a difference to climate change, while the women tended to be more committed to climate change mitigation. Nevertheless, the women also questioned the effect of their individual changes in behavior:

> Anne: If I believed that my small screen could contribute to us avoiding the climate changes… Because I do believe that something is going on. Something that is not good for us. Right? But, then again I think that one should concentrate on bigger changes regarding other more important areas, before I start using less water in the shower or something like that (…)
>
> Int.: That your personal consumption becomes very small in the larger context?
>
> Anne: Yes, that it doesn't matter. You think about it when you are able to. But, I guess I'm just not that committed. Previously I was – I have become less focused. Yes (laughter). (…).
>
> Mari: In the Western countries, we excel at questioning the climate issues – whether these changes are due to our behavior or not. Right? (…) We manage to explain that these problems are not our responsibility. But, at the same time – we are aware of the fact that we pollute. Right? We also justify our actions like this: "My small screen – what does it matter when all the others… the Americans and the industrial chimneys…" I can't do much about the industrial chimneys, but I can do something about my old car. Right?

Anne expressed a sense of futility. She and many other interviewees doubted that their energy behavior was significant in the global context. Still, the morality of saving induced efforts to reduce energy consumption, and many of the interviewees argued, like Mari, that they should take responsibility to save energy. Environmental engagement was also an important reason to be concerned about energy consumption.

According to Karlstrøm et al. (2009), policymakers argue from a point of view that positions the ethos of energy efficiency as a set of economic concerns influenced by prices, opportunities to invest in one's home and proper information. The focus group interviews provided a different idea, in that interviewees argued for energy efficiency on a mainly moral basis, with reference to an underlying ethos. This ethos was observable when interviewees explained *why* they acted as they did.

Interviewee accounts included what could be considered moral calculation practices. At the outset, the observed moralities were contradictory in terms of the actions they rationalized. Seemingly, the morality of saving was most frequently drawn upon. However, this morality tended to be moderated by concerns related to needs, merit and entitlement. To navigate this normative terrain, the interviewees made moral calculations – on the one hand, on the other hand, and so on. The effects on the domestication of energy efficiency were ambiguous. Some claimed to make efforts to save energy, but most interviewees seemed to domesticate energy efficiency and energy use in a stalemate fashion. They wanted to save, but, on the other hand, needs, merits and entitlements evened out their efforts. Furthermore, most energy efficiency activities were obscured as comfort initiatives.

This outcome also reflects the ambivalence related to the responsibility of making energy consumption sustainable. As we saw, interviewees' views on this were based on moralities of internal or external responsibility, or some mix of these. In their domestication of energy efficiency, many interviewees seemed frustrated and powerless. They doubted that their energy practices really

mattered in a global context, and they felt that it would be unfair to ask regular consumers to take action while big companies and nation states were overlooked. Others argued in the opposite way, claiming that everyone should consume energy efficiently. These interviewees' moral calculations tended to emphasize the morality of saving, while those who externalized responsibility put more weight on needs, merits and entitlements.

Conclusion: The ethos of energy efficiency

This paper has explored the ethos of energy efficiency – a set of guiding beliefs or values – through an analysis of the way in which Norwegian households domesticate energy and energy efficiency. This led to the identification of important elements of the ethos of energy efficiency. We have observed that economic motives were marginal in the interviewees' domestication of energy efficiency. Furthermore, the interviewees claimed to be confused about smart energy efficiency behavior, but this was mainly related to political issues, rather than knowledge. Thus, the ethos appeared to mainly consist of four partly conflicting moralities concerning (1) saving, (2) needs, (3) merit and (4) entitlement, with respect to energy. These moralities could be seen in the interviewees' accounts when moderating each other, as well as when making economic arguments.

Apparently, it was crucial to the interviewees to present themselves and their opinions in a way that recognized energy efficiency as an important concern in their everyday lives. Many of them argued that energy saving is crucial for economic, as well as environmental, reasons, and made this argument through a *morality of saving* that emphasized thriftiness. The morality of saving was first moderated by a *morality of merit*, through which efforts to save energy in some areas merited relative wastefulness in others. Many of the interviewees also claimed to lack possibilities for saving energy. This set of arguments was based on a *morality of needs*, which also hampered the morality of saving. Through the morality of needs argument, interviewees argued that they had to use whatever they were currently using in order to manage their everyday lives. Finally, the

morality of saving was moderated by a *morality of entitlement*. With this reasoning, access to plentiful energy was seen as a self-evident privilege – a natural right to use all the energy needed to enjoy everyday life without having to justify energy practices. A final moderating factor was ideas about whose responsibility it is to act: Did the interviewees feel responsible (showing internalization), or did they feel that responsibility lay with someone else (showing externalization)?

As we have seen, the interviewees domesticated energy efficiency in dialogue with their ethos of energy efficiency. Above all, we observed that symbolic domestication was co-produced with the ethos of energy efficiency. Further, in their domestication of energy efficiency, many of the interviewees seemed frustrated and powerless. Obviously, their lack of energy efficiency domestication to produce new practices was excused through reference to the moralities of needs, merit and entitlement. Also, the morality of externalized responsibility was an important factor behind this.

What is achieved by invoking the concept of an ethos of energy efficiency in understanding how households relate to such issues? Previous research on energy cultures has observed similar features underlying the lack of engagement with energy efficiency, but the focus on ethos as featuring distinct and partly conflicting moralities is a step forward in clarifying how households make sense of their consumption of energy and energy efficiency efforts. Moreover, it elucidates the way in which decisions are shaped through specific processes of moderating moralities, providing diversity with respect to processes of domestication.

This means that effective energy efficiency measures must relate to the described ethos and the resulting diversity in the domestication of energy efficiency. The moral reasoning should be addressed by diversifying policy instruments, and also by making visible the fact that energy efficiency matters and that energy efficient activities are a shared responsibility.

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Appendix

Interview guide: experts (economists, policymakers)

Background data

- Age, education, previous work experience, current position

About research/work in general

- How do you work/ what do you do/how do you do your research?
- What networks do you belong to/who are your contacts?
- How do you make known your expertise (in regards to politicians, the general public, etc.)?
- Experience with the media?
- How are you able to influence decisions on economic matters?
- What kinds of research methods do you employ in your research?

About the Energy Act/the content of the law

- What is the Energy Act really about?
- What thoughts did you have (if any) about the place of the energy firms in the Energy Act? How did you think they would respond to the new electricity market?
- What thoughts did you have (if any) about how the consumer was treated in the Energy Act? How did you think they would respond to the new electricity market?
- What do you mean by the term "economic efficiency"?

The lawmaking process

- We are interested in finding out about what went on when the new Energy Act was created: who was involved, what kinds of discussions/talks, who "won"?
- Where were you when the Energy Act was being created?
- Describe your role in the construction/formation of the law.
- How did you work on it?
- What intentions lay behind the new Energy Act?

- Who were your contacts among the politicians and the bureaucracy?
- How did this cooperation occur? (between politicians and expertise) How did you go about in order to gain acceptance for your suggestions?
- How do you recall the political discussions around the amendment of law? (yes and no arguments)
- What influence do you think you had on the new law?
- What did you think about the role of the lawyers? Does the wording of the law reflect the
  economic content? (problems of translation between economists and lawyers)

The effects of the law

- In what way did the new Energy Act contribute to more economically effective management of energy?
- The role of consumers? How did he/she react?
- And the energy companies? What is their role?
- How do you feel the Energy Act works today? Has it functioned according to the intensions?

Interview guide: focus groups with consumers

About awareness of energy consumption

- How important is energy consumption to you?
- Do you give any thought to daily energy consumption? Does energy consumption influence your daily decisions in regards to energy use (showering, heating, transportation, etc.)?
- How about when you use the computer, tv, lights, washing machine, etc? Do you try to limit consumption or does it not matter at all?
- Is it important for you to conserve electricity? Why is it important?
- Thoughts on the effect of Earth Hour?
- How about choice of transportation and driving pattern? Is there anything in your daily use that you are particularly aware of (for example getting to and from work)?
- Has the focus on climate change had any influence on your energy consumption, your selection of energy source, or are there other factors that are more important (cost saving)?

About energy consumption in everyday life

- Have you done anything active to save energy in your home? If yes, what?
- What is the motivation behind your choice (cost saving or environmental concern)?
- What experiences did you gain from this (Was it easy? Did you get the help you needed?)
- What kind of heating do you have in your home?
- Was it your choice or just something that happened to come with the house? If the first case, why did you make the choice?
- Have any of you changed your heating source (installed a pellets stove, switched to a hydro-based heating system or an air-to-air heat pump)?
- What was the reason for the change?

- For those of you who have not yet changed your source of heating, what would make you switch to a new source? (Have you considered doing so, but have since given up?)
- When do you think is the best time to make these changes? Does it coincide with renovating your home?
- Do any of you have experience with home renovation? Did you receive any information on energy conservation measures from anyone? (The role of tradespeople? Who helped?
- Are any of you planning to purchase an electric car, why/why not?

About energy conservation in general

- What does the term "energy conservation" or "enøk" mean to you?
- In which ways do you think we can conserve energy?
- To what extent do you feel that we have enough knowledge about alternative heating sources and means of energy efficiency?
- Are you aware of subsidizing schemes for changing energy systems?
- To what extent do plans about moving or thoughts about moving soon influence the decision to refrain from investing in energy efficiency measures?
- And do retirees feel they are too old to invest?

About the market

- What do you think about the fact that we have an open energy market where electricity is sold exclusively to whomever can pay the most?
- How does it work? Who is responsible for what? (Who is responsible for example for the power grid?)
- What factors influence the price of energy?
- How do you feel about the price of energy?
- Do you know how much you pay annually for electricity?
- From where do you get your information on energy consumption? Is the information comprehensible?
- Are you aware of who provides your electricity?

- Have any of you changed provider? If so why, or why not?

About renewable energy sources

- What is your attitude toward increased consumption of renewable energy sources like bioenergy, solar energy, or wind and wave energy?
- How do you feel about the extensive program to lean and depot CO2?
- What do you think about renewable energy technologies such as windmills?
- What do you believe we must do in order to achieve a more sustainable energy consumption?
- Whose responsibility is it to see that we consume less energy and take into use renewable energy sources in Norway (people themselves, industry, politicians)?
- Do you have the impression that politicians are concerned about energy consumption and renewable energy sources?
- What is your view about the role politicians play in preparing for less energy consumption and the use of renewable energy sources?

Overview of focus groups and participants

Group no.	Group characteristics	Age span	Social background	Fictive names	Date and place of interview
1.	4 women and 2 men, studying together	25-35	Master students, Interdisciplinary studies of culture	Else, Ingrid, Katrine, Sara, Espen, Martin	Feb 2009, at the university in Trondheim
2.	3 women and 3 men, attending the same PhD-class	30-40	PhD-students from different universities, representing various fields of study.	Arne, Jo, Ola, Ida, Lise, Annika	April 2009, at the university in Trondheim
3.	3 women and 2 men, some neighbours and members of a band	42-62	Varied; one dentist, one IT engineer, one employed in advertisements, one accountant, one employed by the labor union	Mari, Anne, Kari, Hans, Jens	April 2009, at the home of one of the participants in Trondheim
4.	3 women, acquainted with each other	28	One journalist (MA in political science), one teacher (MA in geography), one civil servant (MA in economics)	Astrid, Elin, Maria	April 2009, at the home of one of the participants in Oslo
5.	7 retired men from an exercise group	70-85	Varied (now retired); one photographer, one engineer, one economist, one publisher, one civil servant, one head of logistics, one from the oil industry	Aksel, Rudolf, Johan, Theodor, Erlend, Anders, Olav	May 2009, at the gym in Trondheim
6.	3 men, old friends	38	One consultant (MA in Anthropology), one lawyer, one store employee	Richard, Erik, Kenneth	June 2009, at the home of one of the participants in Trondheim
7.	3 women and 3 men, colleagues at the Welfare Office (NAV)	35-51	Three ergotherapists, one engineer, one coordinator/social worker, one project leader (MA in geography)	Lars, Fredrik, Knut, Lisa, Julie, Ragnhild	June 2009, at the work place
8.	2 women and 3 men, living in Steigen (a small community up North)	36-69	One teacher, one cleaning worker, one retired sailor, two social workers.	Gunn, Marit, Hans, Andreas, Bjørn	July 2009, at a community center in Steigen
9.	3 women and 1 man, living in Steigen	41-70	One teacher, one retired cleaning worker, one unemployed, one hospital assistant	Anita, Grete, Ida, Finn	July 2009, at a community center in Steigen