



NTNU – Trondheim
Norwegian University of
Science and Technology

Saving Energy Through Culture

A multidisciplinary model for analyzing
energy culture applied to Norwegian
empirical evidence

Marthe Arnesen

Master in Industrial Ecology

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Supervisor: Helge Brattebø, IVM

Co-supervisor: Christian Klöckner, PSY

Norwegian University of Science and Technology
Department of Hydraulic and Environmental Engineering

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Summary

As part of mitigating climate change, the last decades have seen an increasing focus on energy efficiency and reducing energy use within all areas of society, including the residential sector. However, reducing energy use in households has proven to be very complex. In Norway, energy use in households has surprisingly leveled off, but not declined, since the mid-1990s. Though, this has occurred at a relatively high level compared to other countries, and has come as a result of unexpected and potentially temporary developments that were hardly the result of a coordinated effort to reduce energy use, so action is still required. For this reason, this thesis attempts to push the field of Industrial Ecology beyond its traditional techno-economic solutions to theoretical developments in the social sciences related to energy use, in particular those around the concept of energy culture.

Research on energy use has traditionally focused on technological and economic solutions, and with an understanding of consumers as purely rational beings whereby energy efficiency would hold the answer. However, as this thesis shows, reducing energy use in households requires looking to the social and cultural context within which consumers live, as well as psychological constructs such as habits and social norms.

The empirical evidence of this thesis is taken from eight focus group interviews done as part of a project between Enova and the project leader Professor Christian Klöckner from NTNU. Through a qualitative thematic data analysis, six themes were discovered that characterize Norwegian energy culture. One could particularly describe the current energy culture in Norway as revolving around notions of comfort, convenience and coziness. What people consider part of the good life is naturally connected to a very energy-intensive lifestyle. Using theories from social science literature, this work explains ways in which energy use can be understood as a relationship between culture, policy, regulation, technology, groups, individuals, social practices, social norms and habits.

The development of an original energy culture model is also explained and used to explore energy culture as well as interventions to reduce energy use. The model emphasizes the multidimensionality of energy culture, and thus highlights the need for

multidimensional solutions. For example, reducing energy use is not just about more information, the right incentives or saving money, since social practices and cultural aspects act as barriers. Policymakers should keep in mind that designing effective intervention strategies is complicated, especially as policies can lead to unexpected effects. One should also analyze how energy is culturally interpreted when introducing new technologies and policies, as it can be problematic to introduce general energy policies in atypical cultures such as Norway, where electricity is such a significant energy carrier.

The main conclusion is that there is no silver bullet for designing an intervention strategy for any culture, but that cooperation between various disciplines such as sociology, psychology as well as conventional techno-economic perspectives is needed, since energy culture, and thus energy use, happens on a multidimensional level.

Sammendrag

For å kunne redusere energibruk i husholdningene har forskning og politiske virkemidler hatt et stort fokus på energieffektivitet siden 1980-tallet. Imidlertid har det å redusere energibruken vist seg å være svært komplekst. I Norge har energibruken flatet noe ut siden midten av 1990-tallet, men på et veldig høyt nivå. Siden dette ikke er bærekraftig på lengre sikt søker denne studien å få Industriell Økologi til å gå lenger enn sitt tradisjonelle teknoøkonomiske fokus på løsninger når det gjelder energibruk, og inkludere konseptet energikultur.

Tradisjonelt har forskningen rundt energibruk vært fokusert på teknologiske og økonomiske løsninger og med en forståelse av forbrukere som rasjonelle. Imidlertid, som denne studien viser må man også ta i betraktning den sosiale og kulturelle konteksten som forbrukere lever i, samt psykologiske konsepter som vaner og sosiale normer.

Studiens data er hentet fra åtte fokusgruppeintervju som ble foretatt som en del av et samarbeidsprosjekt mellom Enova og prosjektleder Professor Christian Klöckner fra NTNU. Gjennom en kvalitativ og tematisk dataanalyse utkrystaliserte det seg seks tema som kan sies å karakterisere norsk energikultur. Den norske energikulturen kan spesielt karakteriseres for å være opptatt av komfort, kos og belilighet. Det folk ser på som det gode liv er også tett koblet til en svært energiintensiv livsstil. Ved å bruke teorier fra samfunnsvitenskapelig litteratur forklarer studien at man burde forstå energibruk i husholdninger som et forhold mellom kultur, politikk, teknologi, grupper, individer, sosiale praksis, vaner og normer.

Studien utvikler også en energikulturmodell som er nyttig i å utforske energikultur samt de nødvendige tiltak man må ta for å kunne redusere energibruken. Modellen understreker energikulturens flerdimensjonalitet og dermed også behovet for tiltak og løsninger som også er flerdimensjonale. Å redusere energibruk handler for eksempel ikke bare om å gi Nordmenn de rette incentiver, mer informasjon eller muligheten til å spare penger. Dette er fordi sosiale praksiser og kulturelle aspekter fungerer som barrierer.

Politikere bør ha i minne at tiltak og effektive intervensjoner er mer komplisert enn bare å innføre nye energieffektivitetstiltak. Uventede konsekvenser kan forekomme

om man ikke tar hensyn til den kulturelle konteksten folk lever i. Det finnes ingen "one size fits all" løsning, men samarbeid mellom ulike disipliner som sosiologi, psykologi og de mer konvensjonelle teknøkonmiske disipliner er nødvendig siden energikultur og energibruk forgår på et flerdimensjonelt samfunnsnivå.

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1 Introduction

1.1 Background

Energy is critical to the functioning of modern society, though its production and consumption is responsible for emissions constituting a massive environmental strain on the planet. The last 50 years have shown an increasing trend in world energy use with oil, gas and coal being the leading sources, causing long-lasting and significant impact on the environment and natural resources. The global demand for energy is expected to continue growing (OECD, 2008) along with its associated greenhouse gas (GHG) emissions, making it even more difficult to tackle climate change. Urbanisation and economic growth, mainly in developing countries are according to IEA expected to increase the dwelling stock and the associated energy consumption and as such the IEA has stated that “a global revolution is needed in ways that energy is supplied and used” (IEA, 2008: 1). As part of mitigating climate change, the last decades have seen an increasing focus on energy efficiency and reducing energy use within all areas of society, including the residential sector. However, reducing energy use in households has proven to be complicated, to say the least, and despite significant effort, this energy use continues to increase (Wilhite, 2008; Ryghaug & Sørensen, 2011; NVE 2012).

Research on energy use has traditionally been focused on technological and economic solutions, and with an understanding of consumers as purely rational beings whereby energy efficiency would hold the answer. However, a widespread view has developed that reducing energy use in households cannot be solved only by improving the energy efficiency of houses and electrical appliances (Wilhite, 2008; Wilson and Dowlatabadi, 2007; Shove, 2003), and that other factors must also be considered, such as psychological drivers (Stern, 2000; 2011) and the social and cultural context within which consumers live (Strengers 2012). For example, lighting in Norway is not only used for practical reasons, but also because it gives an ambiance which is connected to cultural understandings of what is considered to be cozy (Wilhite et al., 1996). Energy users constitute a key factor in developing and creating long term, yet sustainable energy systems. *How* and *why* consumers use energy must become better understood if we are to be able to create such a system.

Norway is a unique energy case, as it is among the countries that use the most energy in the world, and it has the highest electricity use per capita in the world. The housing sector alone consumes over 70 per cent of its total electricity demand, and over 30 per cent of Norway's total energy demand (SSB, 2012a). Norway and its culture is atypical in the sense that electricity is used for space and water heating, as well as other household activities, due to its significant hydropower resources and historically low electricity prices. As such, energy has attained a very important cultural significance and the Norwegian lifestyle has become highly dependent on it. Furthermore, this has created structures and practices which are difficult to change, which very likely stand in the way of reducing energy use in Norway.

1.2 Research question and objective

This thesis takes an interdisciplinary perspective in trying to understand the drivers of energy use in Norwegian households more comprehensively, with a special emphasis on cultural drivers. By analyzing focus group interviews and available theories from the social science literature, this work aims at explaining ways in which energy use can be understood as a relationship between culture, policy, regulation, technology, groups and individuals. A specific research question for this is formulated as:

What characterizes Norwegian energy culture, how is it affected by the historical development of the energy market, and how can a better understanding of energy culture aid in the reduction of energy use?

1.3 Structure of thesis

The rest of chapter 1 further expands the idea for this thesis within the field of Industrial Ecology, and then with the concept of culture and, more specifically, energy culture. Chapter 2 describes how the Norwegian electricity market and energy use have developed historically. Beginning with a brief intro to the liberalization of the electricity market, the chapter then describes Norwegian energy use and, more specifically, household energy use. Chapter 3 presents the theoretical foundation upon which this thesis rests. It gives an overview of three different approaches (technology/economics, psychology and sociology) used to look at, seek and understand behavior within energy

use. It also gives the reader an idea of how the disciplines differ, what they have in common and how they see cultural and social impacts on energy behavior, if at all. A special focus lies here on the cultural aspects of energy use, meaning the inter-individual characteristics of energy use. The chapter concludes with presenting an original integrated energy culture model based on these disciplines which seeks to illustrate a clear, general structure for building and analyzing energy culture. Chapter 4 describes the methodological aspects of the qualitative analysis used for this work. Chapter 5 presents the results of the focus group study and its analysis. Chapter 6 is a four-part discussion whereby the first sums up and discusses the main findings and how they relate to previous research. The second part looks to the integrated model, as presented in the theoretical chapter, and expands on how to connect evidence from the focus group to the different levels and components of energy culture. The third part deals with the methodological implications of this study and finally, the fourth part discusses the implications for policy and practice, as well as some interventions and solutions. Finally, chapter 7 concludes with a summary of the findings and suggestions for future research.

1.4 Positioning this thesis within Industrial Ecology

As this is an Industrial Ecology (IE) thesis, few words are needed to place this work within the short, yet accomplished history of this discipline. At its core, IE seeks to reduce the environmental impacts from production-consumption systems, and as such is inherently focused on energy – the critical resource that allows these systems to proliferate. Borrowing from the ecological metaphor, IE maintains that energy use in industrial and consumer systems should be optimized to more closely mirror natural ecosystems where energy is re-used and cascaded until it has become low energy waste heat, and exergy losses are minimized at each step of the energy chain (Brattebø et al., 2007). As such, IE has looked primarily at the natural sciences and used technical analysis to assess man-made systems and suggest more ecological system designs, as indicated by the two paths in Figure 1 below. As a field that strives for multidisciplinary perspectives, however, IE has hardly made sufficient use of social science theory, though as this thesis will show, important developments in psychology and sociology regarding energy use are relatively new compared to the more traditional economical and technical

approaches. With global consumption and many environmental impacts continuing to increase, one could argue that technical and economic measures have largely failed, whether due to ineffectiveness, poor implementation or unforeseen consequences such as rebound effects, and that it is time to expand the scope of analysis to disciplines more closely in-touch with human behavior and culture, in an attempt to create a paradigm shift in today's consumption-driven culture.

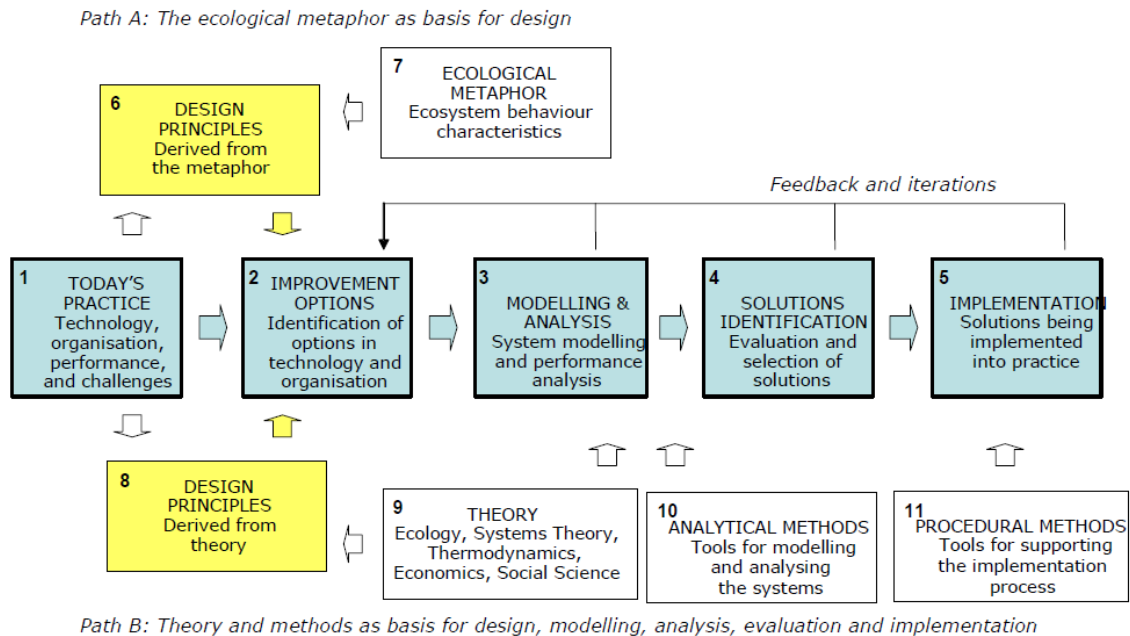


Figure 1, A mental model of the structure of industrial ecology (Brattebø et al., 2007)

1.5 Conceptualizing energy culture

The ways in which people consume resources, such as energy or water, through various practices, such as showering and lighting their homes, can be seen as cultural phenomena that are tied to the cultural context in which we live. For example, Norwegians tend to light their homes with incandescent bulbs to create a certain ambiance, whereas the Japanese prefer fluorescent lighting and find Norwegian lighting to be depressing (Wilhite et al., 1996). Also, most of the time do we not consume energy directly, but rather the services that energy provides, such as illumination. These services may be attached to wants and needs that go beyond the pure satisfaction of physical need

(Wilk, 2002a; Shove, 2003). What determines these wants and needs is subject to cultural determinants (Wilk, 2002a).

Before diving in, it is first important to define culture, though that is no small task as it is a manifold concept. In fact, there is no single, agreed upon definition of culture in the literature (Stevenson & Stevenson, 2009). In a literature review, Soudijn et.al (1990) found 128 different definitions of culture and showed that definitions throughout time have become lengthier and more sophisticated. Unavoidably, these definitions also mirror the various authors’ theoretical interpretations. For example, in a recent definition of culture from the psychologists Matsumoto and Juang (2008:4), culture is seen as *“a dynamic system of rules, explicit and implicit, established by groups in order to ensure their survival, involving attitudes, values, beliefs, norms and behaviors, shared by a group but harbored differently by each specific unit within the group, communicated across generations, relatively stable but with the potential to change across time”*. As products of their culture and social groupings, individuals are influenced by their socio-cultural environment to act in certain ways. Moreover, culture cannot be separated from an individual, nor can culture be separated from historical context, and most importantly culture is learned, and it is learned in social groups (De Mooij & Hofstede, 2011).

Though there is no single, agreed-upon definition of culture, most definitions have agreed on certain characteristics, which are summarized in the table below.

Characteristics of Culture
1. It is a descriptive label that separates one social group from another
2. It refers to aspects of identity that overlap with (though emphasizing different elements from) national, ethnic and racial identity
3. It encompasses both material and subjective elements
4. It is an explanatory label that is used to account for variations in behavior between different groups
5. It is reciprocal: it is produced by its members, yet influences their behavior
6. It is communicated from members of one group to those of others

Table 1, Characteristics of Culture (Adapted from Stevenson & Stevenson 2009: 48)

Culture is something we are unaware of most of the time. It surrounds us and can be found as a generic form of culture, but also as individual cultures. When comparing

cultures, we may discover that what we think is normal and natural, is actually cultural and strange to outsiders. One example of this is the Norwegian idea of comfort. In Norway, it is believed that a comfortable house means heating and certain types of lighting to create a general feeling of coziness, which stands in contrast to the culture in Japan where it was only recently that homes were heated in winter and it is common and seen as comfortable to heat only the space under a sunken dinner table and trap the heat with a large blanket (Wilk, 2002b; Wilhite et al., 1996).

The concept of culture within energy literature has, with the exceptions of Lutzenhiser (1992) and Aune (1998), generally been more implied than explicit. Aune's study (1998) is about everyday energy use in Norwegian households and discusses energy use as a determinant and result of different constructions of the cultural and technological domains. Since Aune belongs to the science, technology and society (STS) tradition within Sociology, her main focus lies on the negotiations between individuals and technologies. She identifies four energy cultures with different implications for energy use, ranging from the self-indulgent who do not consider their energy consumption, to environmentalists who are very concerned with ecological issues, with two in between (Aune, 1998; Palm, 2009). Aune's research, unlike this work, was a cluster analysis, which differs from this thesis as this thesis is more general but arguably also more broad as it also includes psychological explanations for energy use.

As the energy culture model, presented later on page 25 will show, this thesis understands energy culture as an interdependent system of policy, regulation, technology, groups, and individuals with social norms, habits, values and other cognitive variables. These varying aspects influence each other and connect to create an energy culture.

2 Contextual overview

As the structural and contextual conditions at a given historical time are part of creating and sustaining a culture, this chapter will briefly describe how the Norwegian electricity market and energy use have developed historically.

2.1 The liberalization of the electricity market

The energy situation in Norway is characterized first and foremost by bountiful sources of renewable hydropower, of which it is the sixth largest producer in the world. In addition, and more recently, one can point to the exploitation largely for export of oil and gas resources in the North Sea and Arctic. Policy for increased energy efficiency or energy conservation has, nonetheless, been on the agenda since the mid 1970s when the modern world saw for the first time that energy resources were not infinite after all. Since this time, Norway has gone through various stages of motives and means concerning energy conservation as a policy instrument (Næsje, 2000; Godbolt et al., 2009; Aune et al., 2011; NOU 2012:9).

The Norwegian concept of energy economizing, or *ENØK* in Norwegian, was introduced to handle energy saving concerns “with a preoccupation with the economic efficiency of the energy sector” (Godbolt et al., 2009:1). This policy originates from the country’s situation with rich energy resources and an economic dependency on high levels of energy production. As part of *ENØK* thinking, the Norwegian Parliament passed a new Energy Act in 1990 which was projected to change the Norwegian electricity trade from a government-controlled trade to a deregulated market trade. The economic efficiency of industry was among the act’s goals, which included the removal of geographical constraints on the trade in electricity, and shifting pricing power from Parliament to individual utilities (Godbolt et al., 2009). In 1991, Norway became the second country in the world after the United Kingdom to completely deregulate its electricity market. Electricity went from being a good priced by government policy to a market product where price reflected supply and demand. End-use efficiency thus became the responsibility of the consumer, and as such it was assumed that consumers would be economically motivated to save energy (Eikeland, 1998; Aune et al., 2011). The act also opened the market to competition, which meant that Norwegians could buy

electricity from any utility regardless of where in the country it was produced. This was extended internationally when the market was opened up to the Nordic region for trade, and became integrated with the Swedish power system in a common electricity market with a joint power exchange called *Nord Pool* in 1996. Customers were now free to choose between Norwegian and Swedish suppliers. By 2000, Denmark and Finland were also a part of this market, and more recently other countries such as Estonia and Lithuania have joined (Bye & Hope, 2005; 2007; Nord Pool, 2013).

One of the consequences of the deregulated market is the fact that electricity consumed in Norway is no longer 100 percent hydropower, but might be coming from Danish or German coal and nuclear power plants (Eikeland, 1998). During the first years of the new energy market, the Minister of Industry and Energy, as well as the Norwegian industry, praised this trade as beneficial commercially and environmentally, claiming that Norwegian hydropower would replace coal-based capacity abroad. In fact, the opposite has occurred as, due to some especially dry years, cold winters and rising domestic energy use, Norway has had to import significant amounts coal and nuclear power from abroad (Ibid; Bye & Hope, 2005; 2007).

2.2 Norwegian Energy Use

The significant growth in prosperity in Norway since the 1960s has led to an increase in energy use, while at the same time energy use has become more efficient. For example, since around the turn of the century, energy consumption has stabilized within stationary energy uses such as buildings, industrial processes and the energy sector, as seen in Figure 2, due largely to improved insulation and better heating systems (Bøeng et al., 2011; NOU 2012:9; NVE, 2012). In 2011, total energy use in mainland Norway amounted to approximately 229 TWh, which is a decline of 8 percent from 2010 mainly due to the fact that 2011 was one of the warmest of the last 100 years, while 2010 was the coldest year since 1985.

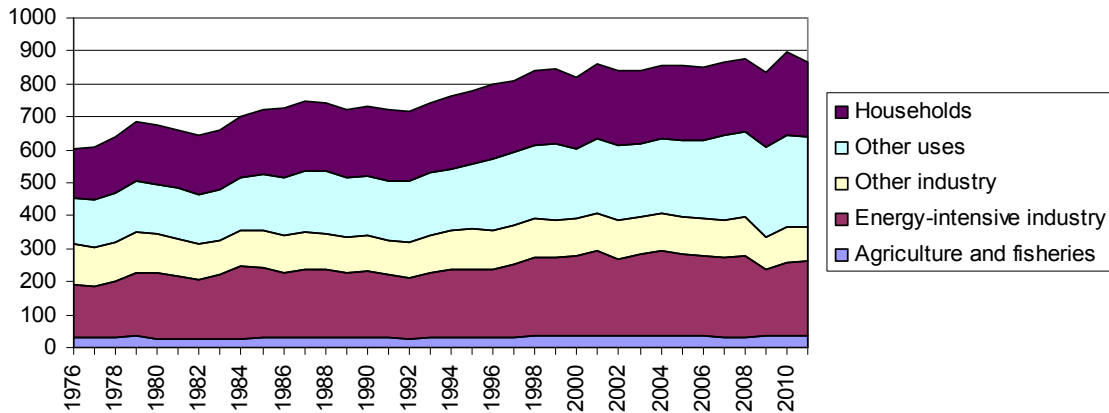


Figure 2, Total energy use within different sectors measured yearly in TWh (SSB, 2012b).

2.3 Household Energy Use – leveling out?

Households account for approximately 30 percent of total stationary energy use in Norway, as seen in Figure 2. There has been a gradual change in the composition of energy use in households since the 1970s as seen in Figure 3. Electricity and firewood use has risen, while oil use has been reduced due to a transition in home heating technology. Curiously, household energy use seems to have suddenly leveled out beginning in 1996, after rising sharply for over 20 years. Since then, the average yearly rate has been between 44-46 TWh, with the exception of 2010 due to extreme temperatures that year (NVE, 2012).

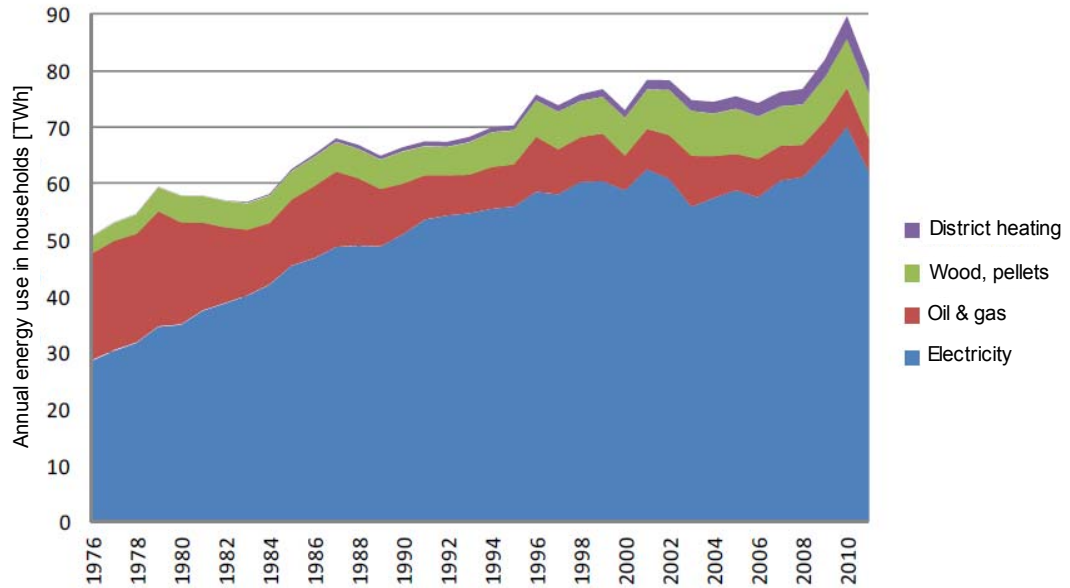


Figure 3, Norwegian total household energy use by energy carrier (NVE, 2012)

This leveling out of household energy use has occurred despite a growth in population and consumer spending. Analysis done by Hille et al. (2011) attributes this phenomenon to three main causes: 1) a slower increase in per capita living area, 2) reduced energy use per square meter, and 3) a milder climate since 1980.

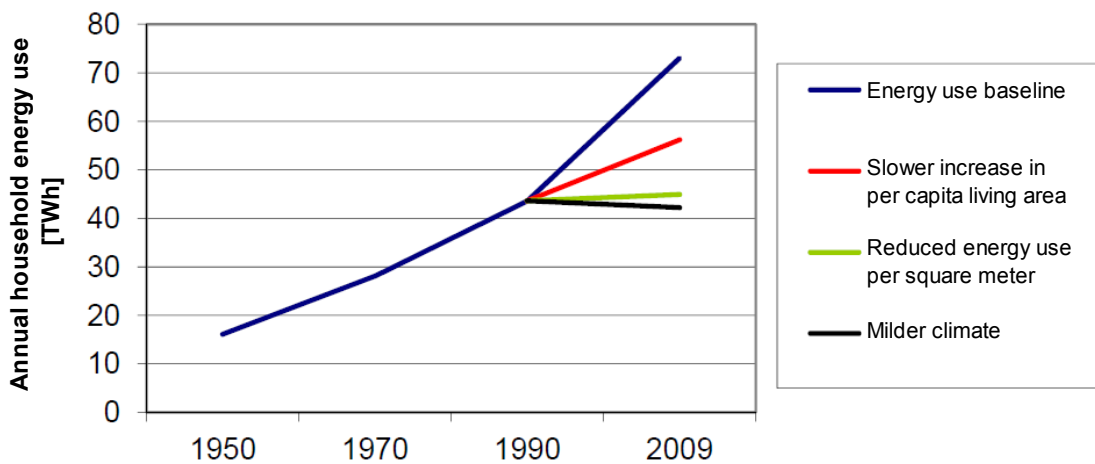


Figure 4, Main explanations for the difference between observed and trend in total stationary energy use in Norwegian households in 2009 (Hille et al., 2011: 11)

As seen in Figure 4, the first cause is thought to have had the biggest impact on energy use. If per capita living area in 1990-2009 had been similar to the growth rate seen in 1970-1990, total living area would have been 36 percent larger than it actually was in

2009. This reduced growth is believed to have been caused by various factors such as more apartments than houses built, higher urbanization, and increased real estate prices and interest rates. Real estate prices have risen significantly, considering that in 2009 Norwegians living area per capita was 2/3 larger than in 1973, but cost 7 times more. Another factor is that an increasing part of Norway's population growth is from immigrants, whom on average live in smaller dwellings than Norwegians (Hille et al., 2011; NVE, 2012).

The second explanation is reduced energy use per square meter. This metric has seen a reduction of 14 percent from the beginning of the 1990s to today. Factors that have led to its reduction are mostly related to better building insulation and improved heating systems, which includes replacing oil and paraffin ovens with panel ovens, heat pumps and upgraded wood stoves. Other factors include stricter technical standards and building regulations, improved heating tanks for hot water coupled with water-saving systems, and energy efficient appliances. The final cause is linked to the observed increase in outside temperature since the 1980s, which is believed to have resulted in a total energy reduction of 2-3 TWh per year (Hille et al., 2011; NVE, 2012).

2.3.1 International comparisons

This leveling out does not mean that the Norwegian household energy use problem has been “solved”, however, as it has only temporarily been reduced as a result of external factors. Using the explanations from, Hille et al. (2011) one would expect that if temperatures go down, energy use will again go up. This is also true for real estate and interest rates. If they were to drop, people could afford larger homes again, which would then increase the level of energy use. This means we still need to look for ways to reduce household energy use if we are to achieve a sufficient decline in the long run.

In addition, although household energy use has leveled off, it did so at a very high level and the overall trend since the 1970s can still be seen as an increase from a longer term perspective. Compared to other European countries, Norway has high household energy consumption as seen in Figure 5 below.

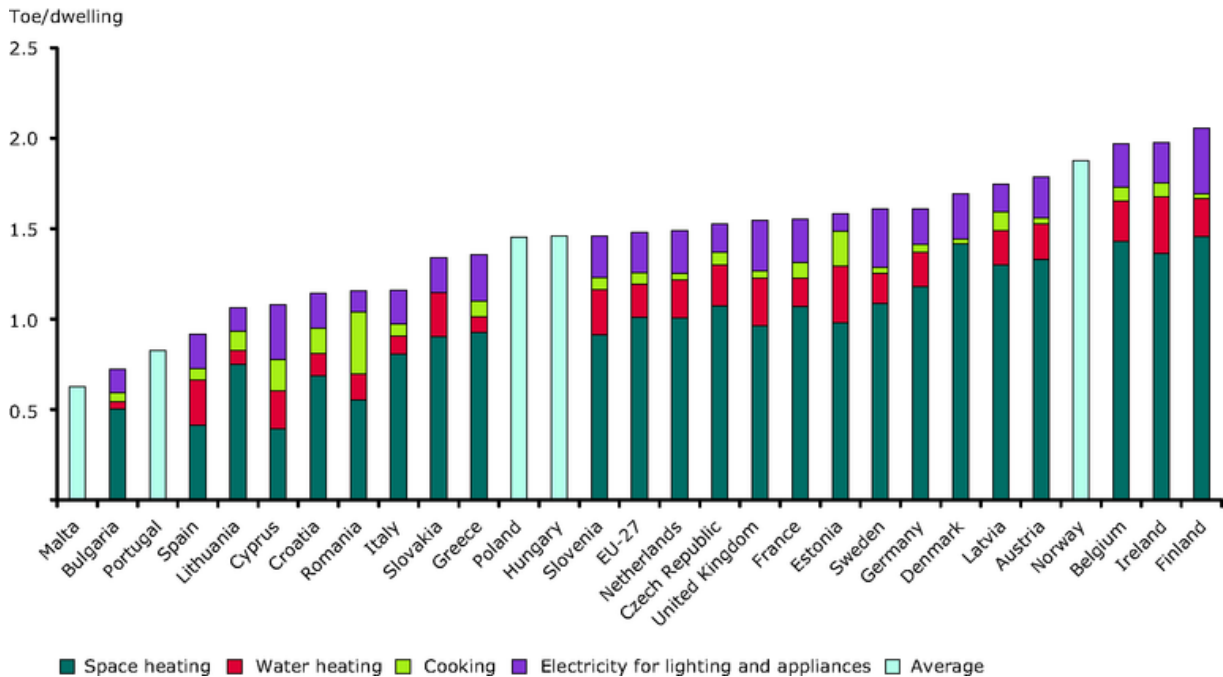


Figure 5, Energy consumption by end use per dwelling, 2009 (EEA, 2012)

When it comes to relative prices, Norwegian electricity has been cheap historically. Before 2003, Norway had very low prices compared to most other OECD countries. The price in Denmark, for example, was 2-3 times higher than Norway (SSB, 2011). After 2003, Norway’s energy prices hit the OECD average level, and in 2010 the Norwegian price was significantly higher than the OECD average. SSB (2011) argues that since Norway’s infrastructure is mostly built on electricity, with district heating not yet well-developed, the increased prices have not contributed much to households changing to alternative energy sources, though more and more households are investing in heat pumps.

2.3.2 Households energy use and its implications

Norwegian households use energy mainly for area heating, water heating and electrical appliances, including lighting. Total energy use was approximately 21 000 kWh in 2011 (SSB, 2011). Of this, NVE (2012) estimates that space heating accounted for 66 percent, water heating 22 percent, and the remaining 12 percent is accounted for by electrical appliances and lighting. Electricity covers approximately 70-80 percent of heating needs, while the rest is covered by bioenergy (7 percent), oil (7 percent) and district heating (4 percent). However, there are large differences in energy use between

different types of dwellings. A typical house uses 25 000 kWh/year, whereas an apartment uses only 10 000 kWh/year on average. Depending on type of insulation employed, an individual dwelling has a large potential for reducing its energy consumption through improved insulation, energy efficient technology and more energy-conscious behavioral patterns (NVE, 2012).

Using excessive electricity for heating, which is so common in the Norwegian system, is not only wasteful of energy, but also of exergy, as this practice impedes more beneficial uses of this high quality energy carrier since heating can be met by any type of lower quality energy carrier. Electricity has, for example, the potential for more beneficial use of its high quality through heat pumps or solar water heating. This could free-up some electricity production for export or beneficial domestic purposes, such as electrifying oil platforms and the car fleet, as well as use in energy-intensive industry (Pauliuk et al., 2013; Sandberg et al., 2011). Seen in this way, it becomes evident how important it is to reduce electricity use in Norwegian households beyond the direct environmental savings within Norway.

3 Theoretical foundations

Across the social sciences, research traditions have explored the drivers of human behavior and suggested various models of decision making. These models differ broadly in their basic assumptions, variables, scale and structure (See Jackson, 2005; Wilson & Dowlatabadi, 2007 for extensive literature reviews), but a “skillful practitioner should be able to run multiple models and flick between them, drawing on the strength of each disciplinary approach in building insight and developing policy approaches” (Darnton 2010: 276). Energy use and energy behavior studies can be usefully divided into three main disciplines: techno-economic, psychological and sociological (Spargaaren & Mol, 2011). This chapter gives an overview of these three different approaches in order to show the different ways in which one can look at, seek and understand behavior within energy use. It will also give the reader an idea of how the disciplines differ, what they have in common and how they see cultural and social impacts on energy behavior, if at all. A special focus lies here on the cultural aspects of energy use, meaning the inter-individual characteristics of energy use. The chapter concludes with presenting an original integrated model based on these disciplines.

3.1 Techno-economic perspectives on energy consumption

The first theories on energy use developed from the energy crisis of the 1970s within the technical and economic perspectives. The former saw the problem of energy conservation as being mainly a result of technical inefficiency, and thus solutions were based on improving the efficiency of energy-intensive technologies. Increased research and development on technical efficiency in cars, home heating systems, light fixtures and food appliances were put in place by Norwegian policy. Furthermore, new laws and regulations were instituted to force manufacturers to improve the energy efficiency of their products (Madlener et al., 2011). The energy problem was also seen as one consisting solely of flows of energy through physical systems that convert it into heat, motion and light. As such, people were not seen as important in the system other than as recipients of the energy, and the important consequences of their behavior were neglected, for example when they use a technical device in a way that is different than what was envisaged by its developers (Wilhite, 2013, 2011, 2008; Wilhite et al., 2000).

In neoclassical economic theory, individuals are seen as rational, making decisions based on their social and economic circumstances. Their motivations are reduced to a simple utility function in which consumption is a matter of weighing the economic benefits and costs of choices against each other. Behavior is assumed to be influenced by prices, information, regulation and taxes, and the rational actor chooses goods and services in accord with fixed preferences, though the choice might be constrained by the inadequacy of information and budget constraints (Begg et al., 1991; Kollmuss & Agyeman, 2002). This rational actor model is guided by the individual's evaluation of outcomes and is thus essentially concerned with self-interest and fulfillment of perceived need (Wilson & Dowlatabadi, 2007).

Consumer preferences are observed through purchasing behavior and it is assumed that consumers have considered all the alternatives before making a choice, which then must be the preferred option. Preferences are furthermore assumed to be stable, but neoclassical economic theory has little to say about where preferences come from or the processes by which they change. Thus, there is a need to research factors other than price alterations and availability to be able to determine the reasons why people change their consumption practices (Pedersen, 2000; Madlener et al., 2011). In addition, energy conservation is seen as having to do with economic efficiency, in as much that economic efficiency of markets (energy markets and markets for energy-using products) has to be improved to reduce energy consumption. In this discipline, it is assumed that consumers with enough information on energy will use their knowledge to reduce their energy consumption (Gram-Hanssen, 2010; Wilhite, 2008; Wilhite & Nilsson, 2008).

Typical economic research has focused on the price elasticity of energy demand, including modeling the sensitivity of household behavior to increasing/declining prices. However, several economics studies mapping the energy price effect on consumption patterns have shown that elasticity is rather low (Zarnikau & Hallett, 2008). How cultural or social aspects influence consumer behavior is rarely, if at all, mentioned specifically within neoclassical economic literature. Nevertheless, the past decade has seen this evolve within contemporary economic research. Behavioral economy, which seeks to incorporate psychology into decision-making, has also incorporated social norms into economic analysis. Although it is still in its infancy, Akerlof & Kranton (2000) for

example argue that there is some evidence suggesting that culture and social norms affect economic decisions and outcomes.

Rational choice theories are deeply entrenched in today's policies, structures and institutions in Western society, including Norway. The liberalization of the energy market in 1991 changed both the energy supply and the approach towards energy users. From being a good that was distributed to a reasonable and stable price, energy became a market product and users became consumers in a market. Subsequently, users were expected to develop an interest in energy efficiency and energy saving because this was seen as the rational and beneficial thing to do (Ryghaug & Sørensen, 2009). Policy approaches to get consumers to lower energy consumption have consisted mainly of price incentives, information and motivational campaigns. However, studies on consumption behavior indicate that the decision-making process of individuals is not always a rational procedure in practice. Habits, emotions and mental associations often influence the choices individuals make (Wilson & Dowlatabadi, 2007).

3.2 Psychological perspectives on energy consumption

The techno-economic perspectives formed a powerful discourse that dominated the theory and policy of energy consumption for several decades. Yet, by the mid-1980s these perspectives were not living up to their expectations as energy use continued to increase in spite of increased efficiency gains (Wilhite, 2008a&b; Ryghaug & Sørensen, 2009; Spargaaren & Mol, 2011). This allowed non-economic social sciences to enter into the theory and practice of energy consumption. Social psychologists Fishbein & Ajzen (1975) and their *Theory of Reasoned Action* (TRA) have been very influential in energy research and policy. These researchers saw humans, much like the economists did, as rational actors that systematically used information and behaved on the basis of intention (Wilson & Dowlatabadi, 2007). However, they also included rationalities other than the purely economic, such as attitudes and social norms. Consumer behavior was understood as being internal to the individual, and the social aspect external to decision making.

3.2.1 Theory of Planned Behavior

The Theory of Planned Behavior (TPB) (Ajzen & Madden 1986; Ajzen, 1991) is an extension of the earlier TRA, developed as a framework for understanding, predicting and changing human social behavior. *Attitudes* are formed from individuals' beliefs about outcomes of a behavior as well as an evaluation of outcomes. Together with beliefs about what others think of a particular behavior, *subjective norms*, these beliefs and attitudes lead to an *intention* to act. *Perceived Behavioral Control* (PBC) was added to the TPB, since the TRA was criticized for not being able to explain situations where individuals do not have full control of an action. PBC is defined as “the person's belief as to how easy or difficult performance of the behavior is likely to be” (Jackson 2005: 48). In other words, PBC is concerned with whether or not the individual is feeling capable of doing the intended behavior or not.

The TPB has been applied to understanding behavior in various contexts, from smoking behaviors, to Internet use and to travel mode choice (Jackson, 2005). Studies relating directly to energy use are still relatively unusual, however (Madlener et al., 2011). Abrahamse and Steg (2009) did a study of 189 Dutch households where they examined the significance of socio-demographic and psychological factors related to household energy consumption. Variables from the TBP and the Norm Activation Theory (Schwartz, 1977) were used and the results indicated that *energy use* was mainly determined by socio-demographic variables, which also supported other previous findings (cf Gatersleben et al., 2002). Household *energy saving*, on the other hand, appeared to be linked to psychological variables such as PBC, attitudes and personal norms. This may indicate that contextual variables shape a given household's energy consumption opportunities, but reducing energy use requires conscious efforts to change behavior, which would be important for policy interventions as they can target the specific psychological variables to achieve energy savings. This could be achieved, for example, through actively working to increase the PBC level.

Although the TPB has been widely used in understanding behavior, it has also been criticized for being too narrow and not able to explain the moral issues an individual feels in certain domains. Psychologists such as Stern (2000) have acknowledged that individuals do not live in a social vacuum and that in certain cases context may override

all cognitive factors (Stern, 2000). Numerous other variables can be added to this model, however, as more variables are added it is argued that predictive capacity decreases and the increasing complexity reduces the models openness to practical application (Jackson, 2005).

3.2.2 The Comprehensive Action Determination Model

As mentioned above, TPB is criticized of neglecting the role with which objective situational facilitators and constraints, habits and personal norms might have on behavior. The role of these is included in the *Comprehensive Action Determination Model* (CADM), which is an integrated theory that combines key variables from several theoretical traditions (Klößner & Blöbaum, 2010; Klößner & Friedrichsmeier, 2011; Klößner, 2010; Sopha & Klößner, 2011). This model was created as an ecological behavior model to include Ajzen's (1991) and Schwartz's (1977) theories as well as assumptions about how routine and habit influence everyday behaviors including energy behavior.

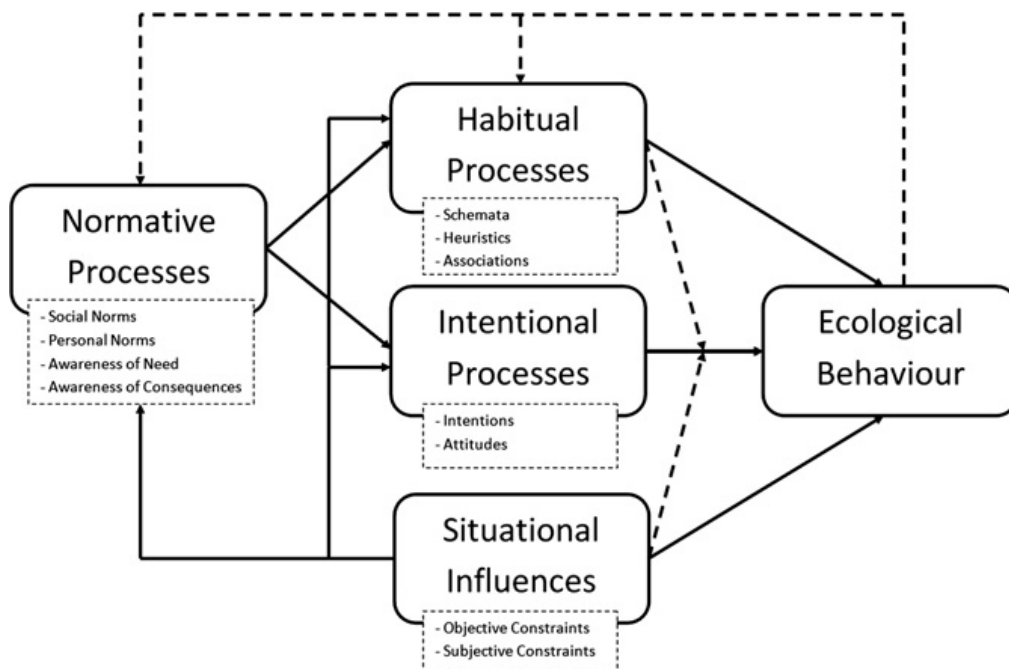


Figure 6, Comprehensive Action Determination Model (Klößner & Blöbaum, 2010)

As seen in the figure above, behavior is predicted directly by three motivational paths. The first is *intentional processes*, where *intentions* (what one intends to do) impact

behavior. These intentions are formed based on *attitudes* (the sum of beliefs one has about an action), which can also be impacted by *situational influences*. This motivational path consists of *objective* and *subjective constraints*, the latter also known as *perceived behavioral control* (PBC), which directly affects a behavior. An example of this could be lack of public transportation so that one has to drive instead (objective constraint), or if the individual perceives that it is not possible to take a public bus because it would take too much time (subjective constraint) (Klößner, 2011). Hence, situational influences directly predict behavior as well as moderate the relationship between intentions and behavior (Klößner & Blöbaum, 2010). The third and last path of the direct variable is *habitual processes*: if an action is repeated often, it eventually turns into routine and becomes an automatic process. This mechanism saves an individual cognitive resource for situations that actually would need attention. Problems arise when new intentions (e.g. trying to turn off lights to save electricity) contradict habits (usually leaving lights on unconsciously). This implies that habitual processes also have the power to moderate the relationship between intentions and behavior. Habits are also linked to specific situations, which thus connect them to situational influences

The only indirect variable is *normative processes*, which include *values*, *subjective norms* and *personal norms*. Together, they determine intentions along with attitudes that eventually lead to a behavior (Ibid). *Values* are general, stable and abstract guiding principles in life that define what a person wants to achieve morally. They vary in importance between different people, situations and cultures, and are used as a backdrop for assessing specific attitudes and norms. *Personal norms* are rooted in an individual's value system, where they have been defined as feelings of moral obligation and are tied to self-concept. In a particular situation, there is self-expectation of specific action, which is experienced as a feeling of moral obligation (Schwartz, 1977). In other words, personal norms reflect what a person feels morally obliged to do in a specific situation based on their value system. Klößner and Blöbaum argue that personal norms have to be activated by generating "an awareness of need, an awareness of consequences and the necessary perceived behavioral control" (2010: 576). *Subjective norms*, also known in psychology as *social norms*, refer to external pressure. The word *social* expresses the fact that the norm is based on group expectations and that by following the

norm or not, punishment or reward are externally imposed and defined (Thøgersen, 2006). Social norms are often separated into *descriptive norms* (other people's behavior) and *injunctive norms* (other people's communicated expectations) (Ibid).

The CADM has been successfully applied to student travel mode choice in (Klößner & Blöbaum, 2010), where situational influences were the strongest behavioral predictors, as well as to student waste recycling (Klößner & Oppedal, 2011), where habits turned out to be the strongest predictor. Although the TPB and the CADM consider individual behavior from slightly different perspectives, they both share the basic assumption that the individual is an autonomous decision maker. The TPB is a rational choice model, whereas the CADM is not. The CADM also includes external influences to a greater degree, though the subject of these two decision models is still the individual. Researchers within the sociological tradition contest this assumption. Both the TPB and the CADM are individual-centered theories, which conceptualize cultural influences as external contextual influence, without explaining how culture emerges from individual behavior, how it stabilizes and changes, or how culture is created. Culture is, rather, just taken as a given. These models tell us that cultural influences on behavior are mediated through social norms and PBC that often freeze into habits. Habits are linked to specific and mostly physical situations, and as PBC is a subjective representation of opportunities and barriers, it can also be open to cultural definition. These models see social or subjective norms (SN) as internal reflections of the social context within an individual. Thus, when a person internalizes social norms, they might become part of their personal norms. However, this is not to say that individuals internalize all external pressures. A person could also react differently to external pressures and build a value system that is different from what the external pressures expect. This is then a personal norm that is not part of the social culture. The main learning from this theory seems to be that culture impacts, through social norms, an individual's intentions, which influence behavior. Beliefs lie behind PBC and attitudes, and are often taken from the social context, which are socially negotiated. However, social norms and external pressures are only implied in psychology. The focus is still on the individual and its cognitive variables such as values, attitudes and habits.

3.3 Sociological perspectives on energy consumption

Today's energy policy is typically expressed in terms of tackling consumption, which focuses mostly on the individual consumer (with influences from psychology and economics) and on production, which focuses on technological fixes. Traditionally, it has been believed that changing behavior or managing demand could be accomplished through consumer education, social marketing, information campaigns, consumption feedback and variable pricing schemes, as well as new technologies and devices designed to make resource use more efficient (Jackson, 2005; Strengers, 2010). These strategies rest on the assumption of consumer choice and individual agency, assuming that individuals weigh the costs and benefits of consuming resources in accord with their opinions, values, attitudes and desires. However, they continually neglect what sociologists argue to be most important - the socio-cultural structures surrounding the individual (Spargaaren & Mol, 2011). According to sociology, focusing on strategies such as information, feedback and pricing schemes overlooks "the reasons why people use resources, how these needs and wants are constituted, and how they are changing within the broader context of everyday life" (Strengers, 2010: 4). The mainstream approaches and understanding of reducing energy use in households also ignores the ways in which systems of energy and water provision, including infrastructures and technologies, shape consumption (Van Vliet & Shove, 2005; Strengers, 2010). Thus, some see psychological and techno-economic approaches as insufficient, and in response have developed a new theoretical perspective within environmental sociology to include sufficient attention on the contextual factors that shape individual behavior. This sociological perspective is called *social practice theory*, which today consists of several diverse strands of social theories (Middlemiss, 2009; Gram-Hanssen, 2011; Chatterton, 2011).

3.3.1 Social Practice Theory

While there is no coherent and systematic "grand theory" (Reckwitz, 2002: 257) of social practice, what unites different theoreticians of this practice is the idea that it is at the scale of human practices that a society is reproduced and individuals are socialized. Thus, they emphasize a collective development of behavior as opposed to behavior as an individual effort. Furthermore, it is the interaction between agency and structure and how

this creates practice that is key to understanding action (Middlemiss, 2009). By having a dual focus on agency and structure, practice theorists seek to integrate internal and external drivers into explanations of behavior. The question of whether consumers are free to make choices (human agency) or are bound by forces outside of their control (social structure) has provoked a long debate in the social sciences. This debate ended in the development of Giddens' (1984) *structuration theory*, which attempted to show how agency and structure relate to each other (Jackson, 2005). Practices evolve from the interaction between structure and agency, and knowledge is a feature of groups rather than individuals, with shared understandings culminating in shared behaviors (Ibid, Schatzki, 2002). Finally, the biggest difference from psychological and economical theories is that SPT does not prioritize individual choice or action as the main cause for social change (Warde, 2005). Reckwitz defines practice as follows:

A 'practice' (Praktik) is a routinised type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge.
(Reckwitz, 2002: 249)

This description stands in contrast to other theories of behavior since the relationship between internal factors is not specified. Practices can be conscious or unconscious and may include cognitive processes, where habitual behavior mainly includes bodily activity, as opposed to mental activity (Middlemiss, 2009). Giddens refers to these two polarities of practice as 'discursive consciousness' and 'practical consciousness' (Giddens, 1984). As such, practices consist of 'doings' and 'sayings', and in other words are "concerned with both practical activity and its representations" (Warde, 2005, p. 134). This is a substantial departure from other theories, which tend to characterize the rational or norm-related aspects of mental activity as having control over bodily activity.

According to Strengers (2012), a practice is made up of the following elements: practical knowledge, common social understandings, rules and material infrastructure. *Practical knowledge* is what provides people with information and understanding of how to carry out a practice. It can be seen as what makes sense for one to do at any given moment, and as such is colored by what one has always done. For example, when one feels cold, he/she draws on practical knowledge to find out what practices he/she should do, such as taking a hot bath or turning up the thermostat. This is learned social know-

how, which is accumulated through everyday experience and more importantly is a product of social history (i.e education, upbringing and social experience), and as such is socially- and culturally-shared knowledge. *Common social understandings* can be explained as “common social understandings about right and wrong ways of doing things” (Strengers, 2010: 10), and are also referred to as norms, customs, traditions, common sense or public opinion. For example, there is a common social understanding about appearance, smell and hygiene in western society, which tells people when cleanliness practices should be commenced and how (Shove, 2003). Common understandings emerge *from* a practice, rather than being *imposed on* from an external social force, which separates this from the psycho-social understanding of social norms (Strengers, 2010). *Rules* are something SPT defines in several different ways, but Strengers (2010, 2012) refers to them as the aspects of practice that have to be done, as well as canons of law or bureaucratic rules. For example, in the cleanliness practice, rules might be the personification and reproduction of regulations and standards, and “recommendations are developed and/or introduced by influential or institutional bodies” (Strengers, 2010: 11). Rules emerge out of practices and can be interpreted and incorporated into practices other than how they were originally intended. Finally, *material infrastructures* involve objects, technologies, infrastructures and systems of provision. Objects and materials often shape the practice itself. Here, we can see that SPT has similar intellectual traditions in common with science and technology studies (STS), but as STS focuses mostly on the role of technologies, it is too narrow of a focus as this is only one element of what practices are made up of (Shove et al., 2012).

To make social practice theory more useful and understandable for policy setting a model was conceptualized (Shove et al., 2012: Shove & Pantzar, 2005) which consist of:

- *Materials*, which consists of the physical objects that make, for example, energy behavior possible. For example: technologies, tangible physical entities and resources.
- *Meanings* or images, interpretations, symbolism, discourses and conventions that decide how and when a practice is performed
- *Procedures* are split into frameworks (regulation), competences (know-how and emotions, knowledge) and schedules (the scheduling of a practice). These in turn lead to practices being undertaken in specific ways.

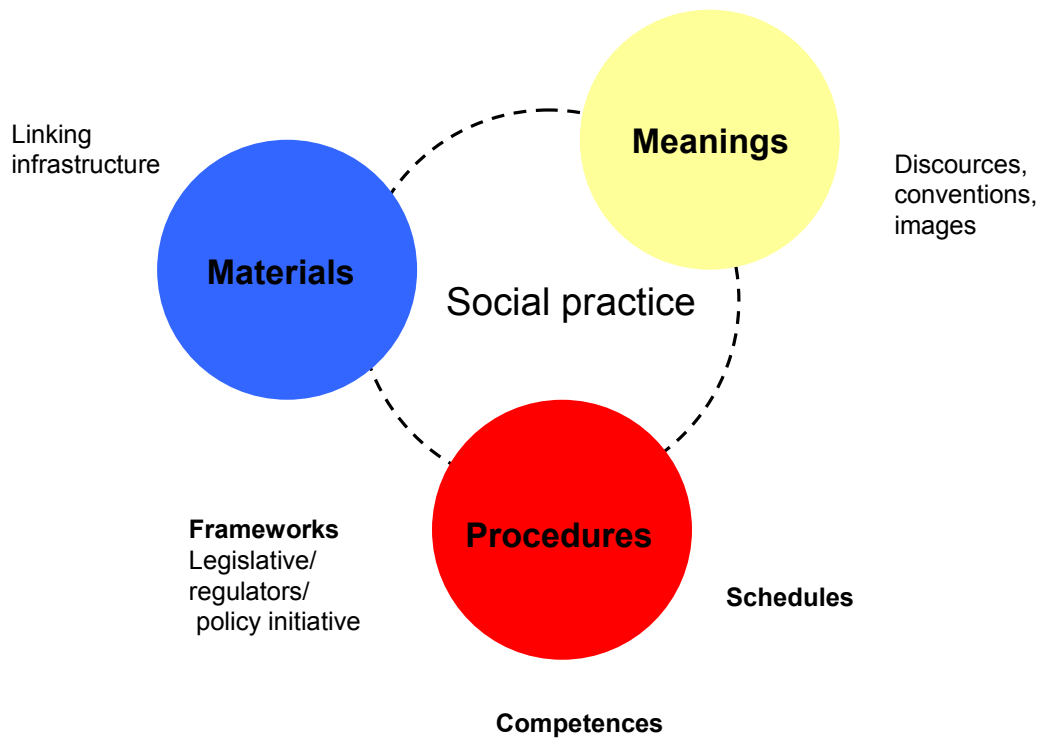


Figure 7, Three Elements Model (Adapted from Darnton et al., 2011¹)

Practices, the grey circuit in Figure 7 above, are seen as properties that arise from the interaction between the above elements, and thus not something that comes about as a direct and linear result as in rational models (Darnton et al., 2011). There is circularity between the elements and the model is non-causal, as opposed to TPB where behavior arises as an outcome of the interaction between specific factors. More importantly, the process of interaction between society and individuals involves feedback, which according to Darnton et al. (2011) means that all practice is habitual. The difference in psychology is that habit is a variable in behavior, whereas in SPT all practices are routine and habit.

The feature of “lock-in” (Sanne, 2002) is also important in SPT, where individuals are locked in to routine practices by upstream factors such as systems of provision and a combination of lifestyle influences, as seen in Figure 8 below. The looped relationship between these two results in interdependence, which again means that to break the lock-in and habit, influences on both sides, for individual factors (lifestyle)

¹ The figure of the 3 elements model is found in Darnton et al. (2011), which refer to (Shove & Darnton, 2010), but that article is not found online. However, the 3 elements have been mentioned in Shove et al (2012) and Shove & Pantzar (2005).

and infrastructure (systems of provision), need to be addressed (Darnton et al., 2011; Spaargaren & van Vliet, 2000).

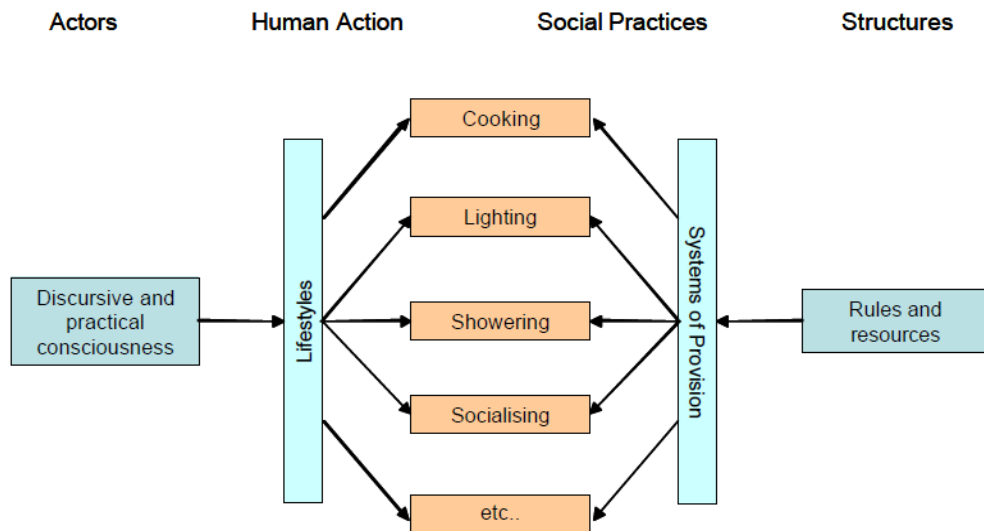


Figure 8, "A conceptual model for studying consumption practices" (Spaargaren & van Vliet, 2000)

Furthermore, individuals are locked-in by the practice itself that has been created by the interaction between lifestyle and systems of provision, where the combination of these two keeps the practice at the status quo. In this way, “bad” habits are seen as the product of a malicious cycle, where rules and resources that bind the practice together are continuously renewed as the individual re-enacts the practice. For example, Hand et al. (2004) argue that people are locked-in to daily showers by the material infrastructure, such as the bathroom equipment and sufficient availability of hot water, as well as the social conventions on bodily freshness and temporal processes in which it has become normal to shower every day. It is this looped relationship between elements that makes the practice a habit and thus difficult to change. To break this lock-in of routine practices, it is argued that one must re-arrange the elements of the practice and break their links (Sanne, 2002; Spaargaren & van Vliet, 2000).

3.4 The interdisciplinary Energy Culture Model

The theories presented above all show how energy behavior can be seen through different lenses, however, separately they do not provide a complete picture. On the one hand, the psychology and economic theories see the energy user as the individual and make interventions and policy targets based on the internal factors of the individual.

While on the other hand, the sociology tradition focuses on the context and structures that influence, interact with, and are created by the ways in which people behave. In the end, however, these different theories are only different ways of analyzing the same thing and should be complementary, at least to some extent. There is also increasing research that bridges different theoretical traditions, such as behavioral economics which combines economics with psychology, and some successful interdisciplinary workings between sociology and psychology (e.g Upham et al., 2009; Devine-Wright, 2010; Whitmarsh et al., 2011). Although there are also some who argue against the possibility of integration (e.g Shove, 2010; 2011; Whitmarsh et., al 2011)², there is validity in taking them all into account when designing policies and strategies to reduce energy use.

As suggested by Wilson and Dowlatabadi (2007), there is a need for an integrated perspective that combines different disciplines: “there is an unexplored potential to reconcile the theoretical preferences of different research traditions” (ibid: 194), and they are all relevant to some extent for explaining residential energy use. In fact, no single analytical approach provides a sufficient framework for analyzing more than a small part of behavior, or for providing reliably successful interventions (Keirstead, 2006; Stern 2000). Lutzenhiser, who has researched energy behavior since the early 1990s, argues that “*this failure is not surprising seeing that we are trying to change a very complex system, with lots of moving parts. And it is not easily reduced to simple explanations (e.g. ‘it’s technology not people’ or ‘people are selfish’) or simple policy approaches (e.g. ‘just get the prices right’ or ‘it’s just that financial incentives are needed’)*” (2008: 3).

Below is an illustrative model of energy culture based on the theories presented previously. It is interdisciplinary and thus arguably holistic, since it takes elements from different disciplines and concerns energy culture at different levels of society: from the *individual* and *group levels*, and the *technology/materials* to the regime with *policy* and *regulations* that influence those two levels, while also influencing each other. Due to

²Shove (2010, 2011) claims there is no potential for integration of behavioral theories with SPT since there is no individual (subjectivity) in social practices. In a response to these arguments, Whitmarsh et al. (2011) argues that Shove’s arguments are too restricted and her interpretation of psychological models too simplistic and that there are strengths and weaknesses with both “sides”. For example, mainstream psychological approaches have been seen as too individualistic, too rational, and not critical enough of the current socio-economic consumerist systems (Burgess et al., 1998; Maniates, 2002; Hargreaves, 2011). SPT has been seen as too structural, not explanatory enough and too radical to produce useful policy solutions (Hargreaves, 2011).

space limitations, *policy/regulations* is not covered as much as the other circles, but is included in order to show its importance in shaping energy culture.

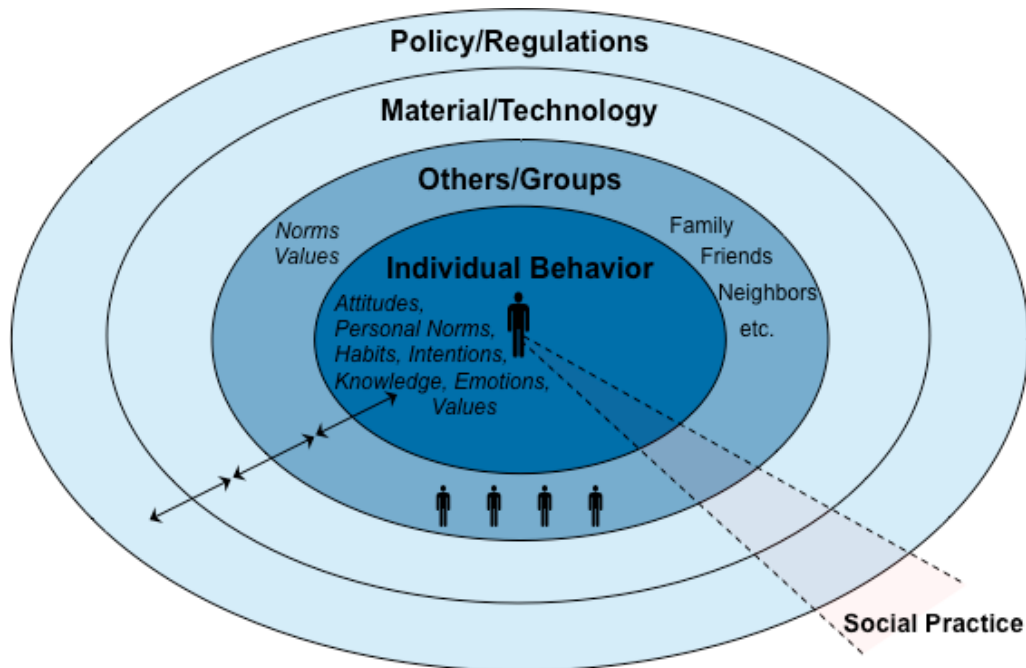


Figure 9, An illustrative energy culture model

Individual behavior is positioned in the center of the model at the individual, where attitudes, personal norms, values, habits, intentions, knowledge and emotions are also situated. These can be termed “cognitive features” and reside inside an individual as argued by the CADM or the TPB. The next circle is *others/groups*, referring to the influences of family, friends, neighbors and the media, where social norms and values reside. The third circle, *materials/technology* is, along with the fourth circle *policy/regulations*, the context in which groups and individuals interact. *Materials/technology* consists of all things physical that make energy consumption possible, such as technology and resources. Here one also finds the geographical context, which includes climate and resource availability, among others. These contexts have significant impacts on the other circles in the model. For example, the perceived need to enjoy oneself with lights and warmth in Norway, for example, is certainly related to geography, while the geographically-determined abundant water and hydropower resources has helped to shape its energy culture. Sliced across these circles, one can find

a given *social practice*, which is influenced in some way by each circle. This aspect of the model correlates to Shove et. al's (2012) *Three elements model*, with *Procedures* being similar to *Policy/Regulations*, or *Rules* from Strengers (2012). *Material/technology* is the same as *Materials* or *Material Infrastructure* from Strengers (2010), and *Meaning* is a mix of the two inner circles, as well as correlating with *Practical knowledge* and *Common social understandings* (Strengers, 2012). However, this explanation is simplified and one ought to remember that the SPT is very complex and not easily compared to psychological and economic constructs. For example, *Procedures* is not only about policy and regulation, but also about know-how and the emotions of an individual (Shove et al., 2012). A social practice, as understood from theory, is an activity that involves all the above elements at the same time. This is what the focus of the SPT analysis is, not behavior in itself. Nevertheless, this model is an attempt to take elements from different disciplines and integrate them into a unified model of energy culture. Moreover, the focus SPT has on *material/technology* and the *policy/regulations*, as well as the concept of *lock-in*, is very useful for explanations on energy use, which is why they are used in this model in addition to psychological constructs.

4 Methodology

This chapter describes the methodological aspects of this thesis. The empirical evidence is taken from eight focus group interviews that took place in four regions of Norway during the summer of 2011. These interviews were done as part of a project between Enova³ and the project leader Professor Christian Klöckner from NTNU. I was not involved in the preparation for the interviews, the interviews themselves, nor the transcription of these interviews. The main purpose of the focus group study was to map behaviors that Norwegians considered relevant regarding energy use, in order to identify the structural and psychological determinants of those behaviors, barriers against and facilitators of energy efficiency, as well as characteristics of Norwegian energy culture (Klöckner, 2011: 4). I later chose to focus on the Norwegian energy culture since this mapping was not developed extensively in the report that was made to conclude this project, and I was given the raw material in the form of transcribed interviews to use for my analysis. The participant sex, age and name are anonymous in the provided interviews. Altogether, 70 participants were interviewed with an average of eight participants divided in each of the 8 groups. The interviews were conducted in, as well as outside of, Bergen, Trondheim, Oslo and Tromsø. These places were selected to represent the geographical differences of the regions in Norway as west, central, east and northern Norway. At the same time, they were chosen to minimize logistical challenges by arranging them in larger groups (Klöckner, 2011).

4.1 Enova project

Despite not being involved in the interview stage of the project, I chose to take this project on since it offered the opportunity to get a much larger dataset, on an interesting topic, than I would not have had the means to do on my own in a typical thesis scope. Before I go further describing the research process, a short description on how the initial project was carried out is given to offer insight into the conditions of the Enova project.

³ Enova is a public enterprise owned by the Ministry of Petroleum and Energy. They work on energy consumption and increasing power generation from renewable sources (Enova, 2013).

4.1.1 Qualitative research and data collection

The method of data collection sets the premise for quality of the collected material as well as the type of data: qualitative or quantitative. Qualitative data highlights opinions, meaning and text. It has an epistemological position, in contrast to quantitative research, whereby “the stress is on the understanding of the social world through an examination of the interpretation of that world by its participants” (Bryman 2012: 380). It furthermore has an ontological position described as constructionist, which implies that social properties are the result of individuals’ interactions and that the social reality is constantly a changing product of perception (Ibid).

The method of the Enova project was qualitative based on *focus group interviews* as the method of data collection. This is a type of interview with several people on a specific topic or theme. Usually there are between six to eight people and the interest for the interviewer is how the participants discuss a certain topic as members of a group, instead of as individuals. This can also be thought of as “the ways in which individual collectively makes sense of a phenomenon and construct meanings around it” (Bryman, 2012: 504). Furthermore, the group dynamic and interaction is seen to be the main source of knowledge. Focus group interviews give participants the opportunity to probe each other’s reasons for having a specific view, and qualify or modify a view. Furthermore, as individuals listen to each other’s opinions, they may agree with something that they might not have thought of without the opportunity of hearing another’s view. In this way, focus groups are helpful for the extraction of a variety of different views on a topic (Bryman, 2012).

4.1.2 Focus group formation

Participants for the main study were recruited by a newspaper advertisement in the most popular local newspapers (Aftenposten, Bergens Tidene, Adresseavisen and Nordlys. See appendix A). They were offered 1000 NOK for participation, which in retrospect might have led to an overrepresentation of students and unemployed people with a strong economic motive to participate. However Klöckner (2011) maintains that there was enough variety in the 120 people that responded to the ads. In total, 70 people were chosen between 18 and 79 years old and each group had eight or nine participants (Klöckner, 2011). As seen in appendix B the majority of the participants were employed

and there were slightly more women than men. The average age was 43. Most of the participants also lived in houses that they owned. The sample is not a representative sample of the Norwegian population, as people living in apartments, people renting, students and unemployed people are all over-represented. However, Klöckner (2011) argues that they did not aim for a representative sample but a sample including a variety of relevant perspectives.

4.1.3 Interview guide and transcription

The focus group interviews were done using a semi-structured *interview guide* (see Appendix C). This guide was developed with the use of the project leader's background knowledge of the topic at hand and existing theories. It consisted of eight parts and matches Howitt's (2010) recommendations on how to conduct focus group interviews. With an introduction of the team, purpose of study, the use of video and recording surveillance as well as mentioning that it was voluntary and that people could withdraw without losing their compensation, the interviewer continued by explaining what is meant by energy. The third part consisted of getting the participants to become comfortable talking about their day-to-day energy behavior. Parts four through six were key questions where the participants freely discussed their experiences and how they perceived their energy behavior, reasons for barriers, motivation for energy efficiency and how they perceived Norwegian energy culture. Part seven consisted of brief discussions on factors from other studies about energy behavior and finally part eight was a debriefing and a thank you for participating (Klöckner, 2011).

The interview guide's main focus was to get the participants to talk about their views on their energy behavior, their reasoning of causes, barriers and facilitators as well as how they saw typical Norwegian energy culture. The project leader did not want to pre-define people's answers, so the interviews were structured with open questions and evolved towards more detailed questions later in the interviews. Video and audio recording were used to ensure that the interviewer could give the participants their full attention and allowed for repeated examinations of what was said. This further enhanced the richness of the data collection (Bryman, 2012). These interviews were later *transcribed* by the project team, where audio was transferred to written form.

4.2 Research process

This sub chapter describes the different stages of the analysis process used in this thesis work. Following the step-by-step guide of Braun & Clarke (2006), the analysis was done in five phases with a break in-between to do literature reviews and writing the context and theoretical chapters. It is important to stress that this process has been dynamic and the way forward has not always been linear, which is very common in qualitative research (Thagaard, 2003; Braun & Clarke, 2006; Bryman, 2012).

The analysis process started with familiarization with the interviews and developing initial codes and themes without having much prior knowledge. After going through the interviews several times, I turned to the contextual and theoretical chapters. Throughout the literature study, I realized that no one theory or discipline could explain energy culture in households and that it would be best if I could take elements from the three disciplines energy research had fallen under; economics, psychology and sociology. This ultimately resulted in the development of an energy culture model. When this was finalized, I went back through another round of analyzing the data, whereby I was looking more specifically for certain concepts.

4.2.1 Thematic data analysis

The data in qualitative research is non-numeric and less structured than quantitative data. This is because the collection process itself is less structured, yet more flexible and inductive (Guest et al., 2012). The type of analysis for qualitative data should depend on the objective. Since I wanted to gain a deep understanding and knowledge of a chosen aspect of the data, as well as show nuances, I chose to do *thematic data analysis*. This is a method that, according to Braun & Clarke (2006), is used to identify, analyze and report patterns within data. It involves searching across data to find repeated patterns of meaning within for a chosen aspect, which in this case were perceptions of Norwegian energy culture. This method was chosen mainly because the themes, and not the individuals, are the focus of this analysis, and because this approach is useful for delving into each topic and comparing information across informants. Thematic analysis is very useful in cases where data collection has already been completed, such that there is a rich and detailed text with plenty of information for a detailed analysis. Lastly, thematic analysis was also chosen because of time and space restrictions for this thesis work, as

well as restrictions regarding already collected data and transcribed material (Howitt, 2010; Bryman, 2012; Boyatzis, 1998).

Phase one – get to know the data

It is important to know “the depth and breadth of the content” (Braun & Clarke, 2006: 87), thus reading and re-reading was the first step in my analysis as well as noting down ideas that came to mind. Usually, the initial knowledge of the data is achieved through the data collection and transcription, but my first phase only began when I received the 350 page transcribed focus group interviews. This phase also gave me certain clues as to what I should look for in the literature review. For example, I noticed that a lot of the participants mentioned how Norwegians tended to turn on a lot of lights in their house, so I had a particular focus on this in the literature on energy use.

As described earlier, the focus group interviews were separated into different sections, with energy culture as part four in the interview guide. However, since the focus group interviews were open, the participants could discuss their thoughts freely, which showed in the data as participants sometimes went back to talking about how Norwegians use energy several times. I thus felt that I could not limit myself to reading and analyzing only part four and instead went through the entire data set to see if anything had been mentioned that could be of relevance to energy culture.

Phase two – generating codes at the semantic level

Phase two involved coding the data, which is the process of defining and organizing meaningful groups of data. Data is broken down into smaller parts by setting codes on words, sentences and other aspects that the researcher finds interesting. The codes are, however, different from the units of analysis, or *themes*, which are usually broader. The identified codes can be inductive or deductive. *Inductive*, or “bottom up”, analysis is a process where the data is linked to the themes themselves. This form of analysis codes the data without trying to fit into a pre-existing coding frame. *Deductive* or “top down” analysis is, on the other hand, often defined by existing research or theories (Braun & Clarke, 2006: 83f). Data coding occurs at different levels, both at a *semantic* (explicit) level or at a *latent* (interpretative) level. On a semantic level, the codes are descriptive and identified based on what the participants have said, so I was not looking

for meaning beyond what is said or written.

This thesis initially used inductive analysis based on the semantic content of the text. I started by reading through the transcripts line by line, noting down potential codes and themes as I saw them in the data. During this initial coding, I had limited knowledge of theories and literature regarding energy use in households and Norwegian energy culture. I had chosen not to start the literature process before the analysis since I believed it could bias my analysis. Therefore, the codes were generated solely on the transcriptions and not on theory or previous research. However, seeing that researchers cannot free themselves from their theoretical and epistemological influences, it is not possible to code in an epistemological vacuum (Bryman, 2012).

During the initial coding, I was looking for anything the participants perceived as being part of a typical *Norwegian* energy behavior. Sentences that had *us*, *we*, *they* or were talking about Norwegians in relation to energy behavior were coded, whereas statements that mostly had to do with themselves as individuals were not. For example:

"Hvis du går inn i de fleste Norske hjem, så står det lys på i alle rom. Hele tiden" (Trondheim rural 3).

"Det er fordi at det er så koselig" (Trondheim rural 7).

"Europa generelt tror jeg er mye flinkere til det der å slukke av lys, inn og ut av rom, enn hva vi er. En familie i Italia, dem gjør akkurat det samme" (Trondheim rural 8).

The transcriptions were coded line for line and sometimes multiple paragraphs were coded together to maintain the context and prevent fragmentation of data (Bryman, 2012). In some cases, one statement could have several different codes, which is natural in qualitative research since the data is typically complex (Walliman, 2006). For example, the extracts above were coded into *illumination*, *other countries are better at turning off lights* and *coziness*.

Phase three – searching for themes

After going through the raw material several times and coding by hand, I systematized the codes in Excel tables, with each organized under a theme (as seen in appendix D)⁴. For example, each code that had something to do with *illumination* was put under that theme. The number of groups and the number of people who had

⁴ The finished end result of the initial table can be seen in appendix D, but due to space limitations only a small fraction ended up being used in the results, as illustrated in the results chapter.

mentioned that code were also kept in order to get a rough quantifiable measurement of how many had mentioned that particular code. The themes were also organized in Word so that it would be easier to find a particular extract later.

Phase four – reviewing the themes and generating codes at the interpretative level

Next, I decided to begin working on the theoretical background. According to Braun & Clark (2006), it is up to the researcher to decide at what stage to engage in relevant theory to become more aware of the subtle characteristics of the data. After finishing drafts for the chapters on context and theory, and developing the Energy Culture Model based on the theoretical perspectives, the analysis was continued with another review of the themes and codes. As I now had a greater theoretical understanding of the material, this review and coding was conducted on more of an interpretative level, where I went beyond the semantics of the data and examined the underlying ideas, assumptions and concepts of these themes which involved a theorizing of patterns, often in relation to previous literature (Braun & Clarke, 2006: 84).

Phase five – defining, naming themes and presenting

The criteria for choosing focus themes for presenting the results was based on the importance the theme had in relation to the context and the phenomenon described (Braun & Clarke, 2006), but also how often it was mentioned in the data. Though the number of groups and people should be understood as an indication only, as it is challenging to interpret and categorize personal statements. Lastly, the focus themes were chosen based on how much they related to theory and previous research, such as social practices, and I also opted to focus on themes that seemed to be new findings. The final result of this phase is presented in the results chapter.

4.2.2 Literature reviews and the energy culture model

A thorough review of the existing literature and theory on energy use and culture was reviewed after the third phase of the initial data analysis in order to get an overview of what theory and research existed. This process continued throughout the remainder of the research project (Ringdal, 2002). The theory chapter developed into an overview of three different approaches that have been used to look at, seek and understand behavior

within energy use, while the focus was on the cultural and social impacts on energy use. The collected literature consists mainly of articles; books and reports from social science research on energy use and behavior. Ranging from the conventional techno-economic to psychological and sociological theory, these were presented to show how energy use and behavior has been researched since the 1970s. The latter was one of the most important in describing culture, as the two former are individual-centered theories conceptualizing cultural influences as external contextual influence, without explaining how culture emerges from individual behavior, stabilizes, changes or is created. The psychological perspective was chosen because, as opposed to sociology, it explains how internal factors relate to one another as well as the social level through social norms. The techno-economic perspective was not further developed due to space limitations, but also because it was less relevant for the cultural and social focus of this thesis. The study of relevant theory concluded by developing an original integrated model based on these disciplines to illustrate how energy culture is constructed.

4.3 Quality criteria in qualitative research

Quality of social scientific research is traditionally discussed in terms of *reliability and validity*, however these terms are used differently in qualitative research than in quantitative research (Bryman, 2012) because qualitative research can be interpreted from a variety of perspectives. As one cannot freeze the social setting of an interview to replicate it, reliability is not considered as relevant to qualitative research. In other words, an absolute account of social reality is not possible. Similarly, validity is considered to be implicitly present in the qualitative data, and as it is not possible to accurately use measurements as in quantitative research, this factor is considered to have little bearing in qualitative research (Bryman, 2012). Instead, other similar criteria are used for verification of the data. According to (Howitt, 2010), it is up to the researcher to assess which criteria is best, and as such I have chosen to use the concepts of *credibility, pragmatic usefulness* and *confirmability* (Bryman, 2012) to assess this study.

Credibility concerns whether the research is carried out in a trustworthy manner and linked to an assessment of data quality. First of all, the steps used in the research process have been well detailed above, along with the assumptions and criteria used to

base the choice of analysis approach on. Furthermore, tables of the findings are presented in the results chapter and the appendix, as well as direct quotes from the focus group participants which provide an understanding of how different themes and concepts were developed. Finally, the data collection itself was, according to Klöckner (2011), done with an audio recorder and two video cameras in order to minimize the risk of technical failure.

Pragmatic usefulness refers to whether the research results have benefits beyond the individual project (Bryman, 2012). The learning value is indicated by whether the results have relevance for further research or if they work in practice (Thagaard, 2003). The quality of research results can be evaluated using several criteria. The results must be grounded in data to ensure that one does not describe a reality that is not what is experienced by the participants, and as such, the participants must be able to relate generally to what is described in the results. Furthermore, the level of general understanding gained by the reader of this thesis is also important. A reader should, in other words, come away with an increase in knowledge and deeper understanding of the researched phenomenon. The reader's ability to gain insight into the data testifies that the researcher has been able to identify key trends and nuances of the material (Thagaard, 2003). Whether the research results can be generalized beyond the specific research context in which it was conducted also influences the usefulness for further research. This will be further discussed in the methodological implications in the discussions chapter.

Finally, *conformability* has to do with ensuring that the researcher has acted in good faith and not overtly allowed personal or theoretical preferences influence the conduct of the research. In other words, the researcher has to be objective. Since this thesis was my first deep excursion into psychology and sociology, I did not have pre-conceived ideas when embarking on this process. Furthermore, the data was reviewed multiple times in order to find and understand all sides of the story, which is more objective than reviewing it just once.

5 Results

The focus group study and the following analysis brought interesting insights into what the participants considered to be typical Norwegian energy culture. This chapter presents these results. In the table below are six broad themes with codes and one theme, which includes variables that were mentioned in connection to the other themes. The numbered values should be understood as only indicative. The extracts are anonymous, with only the city it was taken from and the participant's number, and are included here to illustrate the themes.

To give a brief summary of results, Norwegian culture was characterized as a consumer society with thoughtless and wasteful uses of water, electricity and other material goods. The archetypical aspect of energy culture for Norway seems to be illumination and is a visible indication of the wastefulness the participants pointed out to be characteristic of the Norwegian culture from the consumer side, but also from the public authorities' side. Many were aware of the high use of energy compared to other European countries, which is likely in part from meeting other cultures through traveling. In stark contrast to the energy-intensive lifestyle and high living standard is the idea Norwegians have for their leisure time of getting back to the simple life at cabins where closeness to nature is highly sought after. Here, doing things manually, living without electricity and hot showers, and heating with wood, characterize the ideal life.

The results also show there are several reasons for this typical energy culture. The most important factor is the particular regime that was set up with the hydroelectric power network between 1960-1990 enabling the population access to abundant amounts of cheap electricity. Although prices have increased since 2003, the participants still use a lot of energy, which could be attributed to the high income level in Norway that has made it affordable to spend more on energy in general compared to other countries. Moreover, electricity is perceived as green due to the high percentage of hydro electricity power in the production mix. The fact that Norway's climate is seen as cold and harsh combined with long, dark winters has also led to a perceived need for more warmth and light and is used to justify the higher energy use. In addition to these characteristic social practices, social norms and habits seemed to be very influential in creating and sustaining this

energy culture. The results show that household energy consumption is made up of various social practices, such as showering, illumination, heating and washing clothes. Most of these practices are not acted upon consciously, but are habitual and perceived as necessary. Often, it is the services that energy provides that people desire. Norwegians want, in general, to be comfortable, to have it cozy and warm at home, and to have convenience in their everyday lives.

Themes	Codes	Number of mentions	
		Groups	Persons
CONSUMER SOCIETY	Buy and throw away stuff	8	16
	Have a lot of gadgets	6	19
	Big houses	5	8
	Buy new stuff after 2-3 years	2	9
ILLUMINATION	Illumination	8	36
	Other countries are better at turning off lights	8	21
	Awareness through traveling to other countries	8	20
	Mismatch between injunctive and descriptive norms of public lighting	5	9
INDOOR HEATING & TEMPERATURE	Wood heating	8	25
	Norwegians like it warm and snug	7	15
	High indoor temperature	7	15
	Floor heating (is cozy)	4	11
	High indoor temperature due to toddlers on the floor	4	6
	T-shirt weather inside	2	2
SHOWERING & WATER USE	Norwegians waste water	6	12
	Teenagers shower a lot and waste a lot of water	6	11
	"I shower a long time"	5	11
	"I bathe"	1	1
ABUNDANCE OF ENERGY SOURCES & ELECTRICITY PRICES	Historically cheap electricity prices (no need to save)	8	13
	Electricity and security concerns	7	16
	Take electricity for granted	7	11
	Green/renewable electricity	7	9
	Higher electricity prices and other taxes can be paid	7	9
	Electricity is expensive	5	7
	Unlimited amounts of water	4	6
	Complain a lot, but no action	3	6
Spoiled Norwegians	3	5	

	Panic when electricity is gone	2	4
NATURE & REFERENCES TO TRADITIONAL LIFESTYLE	Childhood memories	6	15
	Cabin	4	10
	References to a simple or traditional lifestyle	4	8
	Energy and nature defines Norway	4	5
	Do not want nuclear/coal production in Norway	3	5
VARIABLES MENTIONED IN CONNECTION TO THE OTHER THEMES	Social norms	8	30
	Habits/Routines	8	20
	Comfort	7	25
	Cozy	6	15

Table 2, Characteristics of Norwegian energy culture (Values are indicative only).

5.1 Characteristics of Norwegian energy culture

5.1.1 Consumer society

The Norwegian energy culture is characterized as a consumer society with a high degree of consumption of illumination, warm water, gadgets and other material goods, many of which are good examples of social practices. As part of the consumer society, goods are usually disposed of after a short period of time and new things are bought rapidly. Participants in all eight groups mentioned that the Norwegian culture had a use-and-throw-away mentality. This consumer culture was also characterized with disposal of food even if perfectly eatable, as well as increased air travel. It is argued that this consumer society is the result of growth in people's standard of living, which has led to an overuse of electricity and water.

"Vi lever et ekstremt forbrukersamfunn. Vi gjør jo det. Det er jo, det er jo bare å se hvordan det handles. Og bare se alle de butikkene, se Jekta (stort kjøpesenter som bygges enda større nå) nå som bygges ut videre, jeg vet ikke hvor mange hundre tusen kvadratmeter det skal bli der. Hvor folk kan gå i dagevis og spise og shoppe og treffe folk. Altså det, hele vår, vi, det er jo sånn man treffer folk og det blir jo en opplevelse og gå og shoppe. Og det ser man jo veldig mye blant ungdommen det å shoppe. Det er jo kjempeviktig. Og det forteller jo litt om det forbrukersamfunnet. Og det synes jeg har forandret seg de siste ti år." (Tromsø rural 7).

The quotation illustrates how consumer society is connected to entertainment and being social, which is interesting as it indicates that shopping is not only about fulfilling needs connected to the acquisition of goods, but also social needs. Shopping has become an activity one does with other people, and especially for the younger generation, it has

become an important part of social life. This shows how shopping practices from one decade to another have changed dramatically. Whereas it was more common to repair broken things before, it has become “normal” to buy new things when something breaks. This is mostly because it has become cheaper to buy new things, particularly clothes, but also because things do not last as long as they used to. For many, this practice has become a common social understanding as described by the social practice literature, or a social norm as described by in psychology. The use-and-throwaway mentality is further discussed in the quotations below.

“Men det er ikke bare mat, men også klær, elektronikk som vi har et ekstremt forbruk. Man må slite ting og bruk, tenker jeg, sånn som de gjorde før” (Oslo rural 3).

“Det er så mye billigere å kjøpe nytt enn å reparere. Og så kjøper vi så billig altså klær for eksempel da. Vi har jo et enormt. Det er jo helt forferdelig hvor mye vi kaster av klær. Som blir sent fra Asia eller tvers over hele jord kloden for å forsyne oss med mote klær. Det er jo helt usagt” (Oslo rural 8).

“Bare en liten anekdote når vi snakker om ting som varer. Tanten til mamma min, hun hadde kjøleskap i snart 60 år, hun kom i lokalavisen, når hun endelig skulle skifte den liksom” (Oslo rural 3).

“De ble produsert for å vare ikke sant, både det og støvsuger og alle sånne. Fordi det var så dyrt, men nå så har det blitt så billig. At det er ikke lønnsømt for noen å reparere det” (Oslo rural 8).

Consumer culture was also discussed in relation to the rapid changes in technology and the perceived need to have the newest gadgets. The fact that Norwegians have a lot of gadgets was mentioned in six groups. In the quotations below, it is quite interesting that there seems to be a perceived social pressure to buy the newest gadgets for their kids and as such this gadget culture is seen as undesirable. This is also interesting as it shows a reflective perspective of the current social practice of acquiring new gadgets.

“Jaja, de får kastet det etter seg. Alt det der siste Playstation og hva det ikke er, ikke sant, dem har alt. Og så ligger det der og samler støv, og fyller opp huset. Og havner på et loppemarked til slutt. Det er helt sykt” (Tromsø rural 3).

“Det er noe med det at vi har så utrolig god råd her i Norge. Og vi kan liksom ikke la ungene våre ikke ha de gadgetsene som på en måte er...” (Tromsø rural 3).

5.1.2 Illumination

Of all the topics the focus groups mention to be part of Norwegian energy culture, illumination was probably the most disproportionately mentioned in relation to its share

of overall energy use. In fact, all eight groups talked several times about this theme, indicating that a high degree of illumination seems to be the archetypical aspect of Norwegian energy culture. The discussions are also indicative of social norms, including leaving lights on, as well as using many lights to achieve a sense of coziness. Furthermore, references to other countries and cultures were often used, indicating the feeling that this is a practice unique to Norway to some extent. Below is a discussion between participants from Trondheim rural.

"Hvis du går inn i de fleste Norske hjem, så står det lys på i alle rom. Hele tiden" (Trondheim rural 3).

"Så står det mye lys på, ja" (Trondheim rural 5).

"Det er fordi at det er så koselig" (Trondheim rural 7).

"Europa generelt tror jeg er mye flinkere til det der å slukke av lys, inn og ut av rom, enn hva vi er. En familie i Italia, dem gjør akkurat det samme" (Trondheim rural 8).

The fact that it is not a social norm to turn lights off when people leave a room is shown very clearly in the next two extracts. The first quote is also a good example of how one person's social practice learned from another country does not fit in with the social practice of Norway, which leads to comments about how "she has been here again turning off the lights".

"Ja, jeg er jo da innflyttet fra [anonymisert]. Og det var omtrent det første jeg merket jeg og. Det var at lyset sto på overalt. Og jeg hørte på min daværende arbeidsplass at, nei, nå har [hun] vært her igjen og lyset er slukket. Så, joda, det var meg" (Trondheim city 3).

"Men jeg har opplevd å ha familier på besøk, barn og de sladrer da på mine barn "de slo av lyset". Fordi de ikke er vant til at det blir gjort hjemme. Og de trodde at min datter gjorde noe helt forferdelig galt. Fordi hun slo av lyset fordi hun gikk ut av det rommet" (Bergen rural 2).

Foreigners living in or visiting Norway also noticed the cultural difference in illumination practices. It is interesting that both quotations below show a kind of frustration when one's own expectations of a social practice does not fit into the current practice. The first quote shows how this person is at first frustrated with the lack of turning off lights after moving to Norway, but that this changes after a while. In a way, this shows how one adapts to a new social practice. The second extract can also be interpreted as instead of being frustrated with the dark itself, the person is more frustrated with not fitting in with the practice at that place. More importantly, this confrontation between different social practices makes one reflect upon our routines and habits, and it is here that one might be ready to change one's behavior in a more positive way.

"Jo jeg merket det samme da kona mi flyttet til Norge. Da var hun mer irritert på meg fordi jeg ikke slukket lysene så ofte. Men nå tror jeg at hun ikke blir det" (Oslo city 6).

"Ja, vi hadde en danske på besøk for 15 år siden og han var helt sjokkert når han var hjemme hos oss. Og når vi var og besøkte han så var jo helt frustrert over meg. Jeg var og veldig frustrert der nede. Fordi de er mye mer innlært til å spare på strøm og vi har jo sløst alltid, alltid" (Oslo city 4).

Another typical feature of the Norwegian illumination culture is the use of many lights around the home, as well as the use of candles, to create atmosphere. These phenomena were also explained in connection with coziness. The word "koselig" (cozy) involves a concept of social interaction (Wilhite et al., 1996) and is associated with the private sphere and leisure time. Leisure time is strictly regulated by social norms, not least related to what it means to "kose seg", or to have a good (cozy) time, and what is considered to be "hyggelig", or pleasurable (cozy) (Vittersø, 2007: 268).

In the below quote, the important symbolic meaning of illumination is shown very clearly. This is related to creating a mood with lighting and shadows, and to contribute to the feeling of coziness and comfort, thus the need is not as much about the brightness of the light itself. There seem to be an added emotional value to illumination with an ascribed meaning of mood-enhancement.

"Jeg tenkte på dette med lys, for vi har en diskusjon hjemme hos oss for vi bor i en enebolig og jeg synes det skal være lyst rundt huset at vi har forskjellige lyspunkter rundt omkring i huset. Vi har sånn at den slår seg av og på når det før er mørkt nok at du må ha lyset på. Men jeg vil gjerne ha flere lyspunkter og mannen min synes at nei det tar altfor mye strøm. Og vi trenger ikke alle disse lyspunktene. Så når noen lyspærer går så skifter han ikke de før jeg gjør det. Så vi har en liten diskusjon rundt det. Men jeg ser at vi blir flinkere til å slå av og på lys av rom vi går inn og ut av. Og faktisk så er det ganske hyggelig tross alt å sitte i stua i skumringen og heller tenne et stearinlys. Det er ganske hyggelig altså" (Oslo city 5).

Another interesting finding was how some referred to how public buildings and street lights in Norway are constantly on. This shows a mismatch between descriptive norms (the unnecessary public illumination) and the injunctive norms (the authorities' claim that people should save energy). The first quote extract below can also be interpreted as a denial of responsibility where he/she believes they can excessively heat their home because the state is already so wasteful anyway. This becomes a sort of "they should do something before I do" mentality.

"Jeg har liksom registrert meg en ting. Jeg har jo altså vært sånn at jeg har fryst på vinteren og sånn og tenkt litt sånn at man kan jo kle på seg litt om vinteren. Men så har jeg kommet dit da, at det å ha det vondt i fem måneder så når jeg ser hvilket stort enormt sløsing det er fra staten

da faktisk. En så liten ting som en motorvei og hvordan den er belyst, jeg vet ikke hvor mange meter det er mellom hver lysstolpe på motorveien. Det kan ikke være 25 meter engang. I virkeligheten så er det jo magert og blir jo slått på etter et viss klokkeslett uansett om det er mørkt eller lys. Og det samme gjelder gatelyset der jeg bor, det står jo på fra klokken fire på dagen. Og så kommer du til Sverige på motorveien og der er det ikke lyst i det hele tatt. Og vi har jo lys på bilen og det klarer vi i Sverige og. Og så tenker jeg hvilken sløsing på en mils strekk da. Og det er det jeg varmer opp hele boligen min for en vinter og så skal jeg lide når det er utgjør ingenting. Det blir jo så marginalt at det er jo” (Oslo rural 8).

“Ja og bare innimellom så blir gatelysene bare stående på døgnet rundt. Jeg har flere ganger ringt jeg og sagt ifra at nå er det noe galt med et eller annet. Og det har gått en måned før de har fått gjort noe med det. Og det er dårlig forbilde altså” (Oslo rural 5).

The quotations above also present the expectation that the authorities should be a role model and if they are not, they lose credibility and diminish people’s motivation to save energy.

A concern for safety and fire prevention in connection to illumination and other electrical appliances is also typical of the Norwegian culture. This is probably due to the fact that the building stock is largely made of wood. Nevertheless, removing plugs from wall outlets is quite a clear social practice, as the practice consists of the houses and appliances as materials and the ascribed meaning of electrical appliances as fire hazards and the procedure of de-plugging. It is interesting that electrical appliances are mainly de-plugged and lights turned off due to safety concerns, whereas saving electricity is perceived as a bonus if thought of at all.

“Grunnen til at jeg slår av lysene når jeg går og legger meg er jo kanskje ikke bare for å spare strøm, eller kanskje ikke i hele tatt for å spare strøm, men det er fordi da blir det ikke brann når jeg sover” (Tromsø city 7).

Routines and habits regarding illumination matter a great deal in everyday energy use as argued by this next participant. The unconscious habit of leaving many lights on around a home can be very energy-intensive.

“De små rutinene har nok mer å si enn det man kanskje trur. At man bare er så pass vant til å skru av lyset, og gjøre det og det og det, at man bare gjør det automatisk. Uten å tenke over det” (Trondheim city 7).

The fact that illumination is a habitual practice infused with social norms is well illustrated in the following extract. Here, the person talks about how he/she was influenced to turn off the lights by living in another country, because it was common to save electricity there. He/she then “got used to it”, implying that the habit around illumination behavior was influenced by social norms. Furthermore, it is interesting to see

other comments on how they think it looks empty in the apartment when the lights are off. Thus, illumination is ascribed a meaning and it communicates that someone is home, even though it is not always the case.

"Jeg bodde i et annet land også, og der var det vanlig at man sparte strøm. Det var ikke noe at vi skulle ha så varmt som vi har det her. Og det med lys, sant det er jo, der vente jeg meg til å, for jeg ble mer påvirket til det å slå av lyset. Så nå også, nå bor jeg i blokk og vi har alle soverom, vi har ganske stor med fire soverom en vei da. Og så tror folk at vi er borte. Det ser så tomt ut hos dere, ikke sant. Men jeg har alle lysene slått av inne på rommene, når ikke vi er inne på rommene, så er lysene av. Og det er noe som jeg har vent meg til når jeg bodde i utlandet" (Tromsø rural 1).

This communication that someone is home by using lights is also used as a preventive measure against burglars. Here is another example of ascribing meaning to illumination in conjunction with security.

"Men jeg tror også det har vært litt sånn, at siden det har vært så vanlig at man har på lysene om natta. Så blir det at hvis et hus står helt tomt. Så blir det et veldig tydelig signal om at her er det ingen hjemme. Så i forhold til sikkerhet, i forhold til innbrudd og sånn, så tror jeg kanskje man har tenkt det når man har reist bort. At vi lar lysene stå på så tror dem at vi er hjemme" (Tromsø rural 4).

"Det er i hvert fall sånn foreldrene mine tenker. De har alltid på et lys når de har reist bort, for ikke å invitere innbruddstyver" (Tromsø rural 6).

The fact that illumination, as well as heating, is a product of social history and upbringing is illustrated in the excerpt below where one participant talks about his/her fond childhood memories.

"Men jeg tenker på i forhold til om strømmen har en verdi så tenker jeg at for meg har det jo, altså energi har jo en stor følelsesmessig, altså betydning. Med minner man har, positive minner fra barndommen så er det jo gjerne fra det varme hjemmet, med masse varme på og en masse lys på i alle krokene" (Trondheim rural 4).

Illumination is a great example of a cultural activity or social practice, in that it is deeply anchored in cultural understandings of how to create the mood of coziness and comfort. The way in which Norwegians illuminate their homes is deeply embedded within the understanding of how to commence the practice and it is for many a perceived need to have many light spots to be able to create a particular mood or atmosphere, as well as communicating that there are people at home, either for neighbors or for burglars. The reason for this phenomenon may have to do with the long history of cheap electricity and the country's far northern geography with very short daylight hours in winter, but it might also have to do with the old ways of using candles, fireplaces and kerosene table lamps for lighting prior to the invention of electricity. This is also something that is

continued in Norwegian cabins today. This practice is also habitual, which can again be interpreted as a mechanism that sustains the Norwegian illumination culture. As argued by Wilhite (2010), this illumination practice has become so routinized that a change requires more than an increase in prices, although below is a quote from a participant arguing that also habitualized behavior can be changed. One only needs to get an “aha! experience” and that one has to “wake up” from the habit to move away from it.

“Jeg tror hvis man skjønner betydningen av...[vaner] så tror jeg man kan i grunn forandre det meste, men man må selv være interessert i det. Jeg tror ikke det hjelper at noen står og sier “du skal.” det tror jeg ikke. Men jeg tro hvis man får en liten A-ha opplevelse, og sier dette tror jeg på, da bør man gjøre det. Og det kan ofte være et incentiv, at noen gir deg en liten gulrot først. Sånn at du våkner litt, for å kunne komme videre.” (Oslo rural 2).

5.1.3 Indoor heating and temperature

The tendency of having high indoor temperatures is another characterization of the Norwegian energy culture, with many having up to 25 degrees Celsius inside.

“Enkelte en besøker de har jo 25 grader inne. Man holder jo på å kveles” (Trondheim city 2).

“Det er jo forskjell på ytterklær og klær. Noen skal ha det så varmt at de kan sitte i t-skjorte hele året” (Oslo rural 8).

When talking about heating, the phrase “*godt og varmt*” was mentioned quite a bit especially when talking about floor heating. This expression can be translated as “warm and snug”, and was often used in relation to what was perceived as comfortable and cozy. High or low temperatures seem to be something people get used to, which leads to habitualizing a certain continued preference. The following extracts illustrate how the physical, here the heated floors, has created a behavior and a social practice. Heated floors are something Norwegians have gotten used to and are especially popular in bathrooms, which has become a place for wellness and a place where people do not want to freeze.

“Men det er også noe som nordmenn har vent seg til. Det er ingen andre land som har varmekabler. Det er nordmenn som har varmekabler” (Tromsø rural 7).

“Men jeg ser jo sånn som jeg har vært ganske mye i USA, og ingen jeg kjenner der har varmekabler. Selv om de har det kaldt på vinteren. Og varmekabler er jo noe som kom på 70 - tallet i Norge. Det var jo den der varmen vi hadde oppe under taket der. Vi har det jo veldig varmt på golvet, jeg er helt enig med deg. Det er noe vi har vent oss til og det er kjempedeilig. Det er et sted hvor vi ikke fryser. Men det er ikke vanlig i så mange andre land å ha det så varmt på badet” (Tromsø rural 7).

“Og jeg nettopp fått varmekabler i badet, fordi jeg har fått nytt bad. Og de vil jeg jo kose meg med og ha på svak varme da. Syns det er deilig” (Bergen city 3).

The perceived need of enjoying oneself and being able to have it warm and snug is in this extract coupled with how cold Norway is. Here, there seems to be an added emotional value to heating.

"Jeg tenker at det med energi for meg har, da tenker jeg Norge er stort sett veldig kaldt og for meg så har det veldig verdi at jeg kan ha det godt å varmt. Altså jeg er ikke en sånn som fyrer så jeg har 25 grader men jeg tenker veldig, vi bor i et land så, egentlig, tøfft klima, at det å faktisk kunne ha sånn noenlunde varme og kunne gå og ta seg en dusj og sånn. Jeg tenker sånn verdi jeg da" (Trondheim city 8).

Several participants felt that because Norway is so far north, it is only natural to spend more on heating than countries further south, which has resulted in a view that Norwegians should be allowed to turn up the heat and have it cozy. There is a sort of geographical restriction inherent in this mentality, where Norway is compared to living at the North Pole, and as such one should be allowed to turn up the heat. Arguably, this is one of the more apparent structural limitations to lowering heating and energy use, and coupled with the historically-cheap electricity, this results in a lock-in of this particular heating practice.

"Men i utgangspunktet så har jeg da den innstillingen at ikke Søren jeg skal ikke fryse i det hele tatt. Det og så innebruk, tenke tanken i det hele tatt å ha på seg stillongs og gå i seg yttertøy inne nesten. Akkurat det bare gjør jeg ikke Søren. Vi lever tross alt i et samfunn og vi er plassert på et sted på globusen langt, vi er langt mot nord og jeg må si det stritter i meg virkelig innimellom når jeg ser en del sånne fy greier på energiforbruket som vi har i husholdningen i Norge. Sammenligne med land nedover i Europa på de verste sammensetningene så er det liksom en sånn fy-innstilling at vi bruker mer på å varme opp her enn land nede ved Middelhavet. Det er jo en selvfølge. Folk som argumenterer sånn kan ikke ha sett på globusen og sett at det er kaldere på Nordpolen enn ved Middelhavet" (Oslo rural 5).

"Jeg tar meg selv også i å tenke sånn som dere sier at søren man må jo få lov til å kose seg selv litt også, selvfølgelig skurrer man opp varmen noen ganger" (Oslo rural 6).

Heating with wood was discussed in all eight focus groups as seen in table 2 and was also mentioned frequently to be cozy.

"Jeg kom til å tenke på det her med ved, peis. Den peisen vi har, den er utrolig koselig fordi at den er, altså helt ned med gulvet. Sånn som han [anonymisert], han elsker å sitte når vi fyrer i peisen, å sitte og du kan varme deg, ikke sant. Og da tenker jeg at den er utrolig fin, med at den gir vanvittig mye varme og i og med at den er så lav så går varmen opp, ikke sant og så varmes det ved mur. Samtidig som det er kos [...]. Veldig flott med peis. Det er kos og varmen. Begge deler" (Tromsø city 8).

"Sånn som han tenker litt mer sånn praktisk i forhold til vedovn så tenker jo jeg at vedovn er jo veldig koselig. Det er liksom god stemning det er derfor jeg har lyst på det" (Tromsø city 7).

Again, we see in the extracts below how indoor heating is habitual. It is interesting that the person in the first extract, after having lived in other countries, can “handle more” when it comes to what is considered to be comfortable heating. These extracts also show reflection on this social practice, as they mention how a particular preference of heating temperature is actually something constructed.

“Jeg vil kommentere det med komfortaspektet. Altså, jeg har jo bodd tre år i England og så har jeg bodd en del i Afrika, og reist en del i Asia. Jeg føler at jeg kan tåle, og er flinkere etter jeg, ja flytta hjemmefra da jeg var 16 år, så har jeg vært mye flinkere til å tåle mye mer. Altså, når det gjelder komfort. Varme for eksempel, at jeg tar på meg ekstra klær og kan hutre litt, det gjør meg ingenting” (Trondheim rural 1).

“Men det er en vanesak hvor varmt man skal ha det som du sier. Når jeg kommer hjem til mine foreldre så er jeg jo i svime. Fordi at dem har det jo så varmt. Og jeg har vent meg til å ha det kjølig. Om folk kommer hjem til oss så synes dem det er kjølig. Fordi at, men det er noe som vi har vent, og jeg ser det er ingen av oss, når vi kommer der hvor det er varmt så blir det for varmt altså. Det kan jo også ha litt med ens egen termostat da å gjøre” (Tromsø rural 1).

In contrast to these last individuals, the next, from Oslo, finds it very surprising that his/her grandmother is happy with wearing a wool sweater while he/she keeps it heated to 27 degrees Celsius.

“Jeg har jo opplevd å ha 27 grader gjennom hele vinteren så jeg blir jo overrasket når jeg kom hjem til bestemoren min og ha på seg ullgenseren sin og stor sett er fornøyde” (Oslo city 3)

The added emotional value to heating and lighting is well illustrated in the next quotations. This also includes references to childhood and comfort and is a very good example of focusing on the services that energy provides, and not the energy itself. Here, warmth and light are ascribed the meaning of mood-enhancers, and wood heating gives the right type of ambiance as opposed to electricity.

“Men jeg tenker på i forhold til om strømmen har en verdi så tenker jeg at for meg har det jo, altså energi har jo en stor følelsesmessig, altså betydning. Med minner man har, positive minner fra barndommen så er det jo gjerne fra det varme hjemmet, med masse varme på og en masse lys på i alle krokene. Og det er klart at hvis ikke jeg har det så bra en dag eller i en periode så synes jeg faktisk at det er godt for meg å ha på litt ekstra varme og, ja litt ekstra lys. Og spise litt sjokolade og sånn. Så jeg gjør jo ikke det bestandig, men ...” (Trondheim rural 4)

*“Er det å få det litt varmere hjemme, er det noe som løfter humøret litt?” (Interviewer).
“Ja da må man ha vedfyring. Det går ikke med elektrisitet, for å se det sånn, for det handler om stemningen” (Tromsø rural 8).*

As illustrated in the extract below, he/she talks about a social practice of how the heating system used to be before. Historically, people only heated rooms they used most of the time, such as the kitchen.

“Før så var det jo ikke uvanlig at det var kjøkkenet som var i bruk og et kammers kanskje. Storstua den ble brukt til jul som man fyrte opp der eller hvis det kom besøk eller det var noe spesielt som skjedde. Så man hadde varme på i færrest mulig rom i husstanden” (Tromsø city 4).

One of the more peculiar discussions relating to heating was how some participants saw it necessary to have a high indoor temperature because they had kids crawling on the floor. This naturally incurred a higher rate of electricity use. This was mentioned in four groups, although there were also those who did not agree to this practice.

“Men strømforbruket forandrer seg jo med livsfasen når du har unger som ligger på golvet så må du har det varmere på golvet. Når en har lært å gå med sokker på om ikke annet så blir det noe annet” (Trondheim rural 7).

“Ja, jeg har et veldig gammelt hus, og det er veldig golvkaldt. Så jeg er veldig bevisst når hun var liten og det er veldig kaldt, men nå...” (Trondheim rural 6).

“Det der er jo da kvinnfolk-tenking. For jeg har jo tre unger jeg også, men jeg har jo aldri tenkt på de tingene der” (Trondheim rural 5).

“Nei, jeg tror ikke samboeren min tenker på det heller” (Trondheim rural 6).

Heating is a social practice, as one can clearly see that it has all the elements that make up the “3 elements model”: *material* (electricity, heating equipment), *meanings* (emotional and symbolical value of heating that gives comfort and wellness), and *procedures* (heating system knowledge). Through these collectively-shared elements, the practice is sustained or, as described in psychology, habitual.

5.1.4 Showering and water use

Showering is one of the most energy consuming daily rituals of Norwegian households. The rush of everyday life leads many to shower not just once, but several times a day and long hot showers are often prioritized. This use is often not conscious but is seen as normal and necessary. It may be seen as routine and habitual, but in fact it is a practice that differs between cultures, time and place.

"Jeg kunne sikkert ha spart en del på varmtvann. Jeg dusjer vel gjerne med litt for varmt vann og litt for lenge. Så der tror jeg jeg kunne ha spart. Jeg kan godt finne på å dusje om morgenen og kvelden. I mitt hjem så er det nok varmt vann som jeg kunne ha spart" (Tromsø city 5).

Showering is not only about getting clean, but it can also be about waking up in the morning, preparing for bedtime, cooling off or getting warm. Showering is even considered to be for pleasure and recreation. This social practice consist of the three elements as described earlier whereby the materials include hot piped water, competence or know-how includes being able to run the boiler in order to get hot water at the right time, and images that include the notion of daily freshness and cleanliness. Seen from the psychological perspective showering is connected to the social norms of being clean and fresh, but is also deeply habitual. Thus, showering is composed of a variety of social and technological elements, and cannot be seen solely as a hygiene practice. Nearly all focus groups mentioned how much Norwegians use and waste a lot of water by showering often and letting the tap run while brushing teeth. Showering was often mentioned as a high priority use of energy in as much that individuals were willing to save energy in other areas so that they can shower as much and as long as they like. The extract below shows the view that one needs to spend a certain amount of time in the shower, something that is culturally defined.

"Jeg har valgt å være miljøbevisst på enkelte områder, men når det gjelder det å dusje så er det vanskelig å spare. Så i dusjen så står jeg så lenge jeg trenger" (Bergen rural 10).

From the interviews, there seems to be a generational difference in how much people shower or bathe today compared to in the past. For example, there was only one person who mentioned he/she takes baths today, while as kids most bathed once a week. This stands in stark contrast to today's practice where kids or adolescents shower everyday. The extracts below talk about this difference and how difficult it is to change habits, especially showering in the morning. As showering is habitual for most, it is something that is done without conscious forethought.

"Det er i hvert fall vanskelig å endre på vaner. Når du står opp og går i dusjen om morgenen så, men hvis du gjør det hver dag så er det vanskelig og endre på" (Tromsø rural 5).

"Ja, når vi var små så badet vi jo en gang i uka" (Tromsø rural 8).

"Hver lørdag" (Tromsø rural 5).

"Hver lørdag ja. Nå er jo ungene, dem er jo i dusjen hver dag" (Tromsø rural 8).

"Så det er riktig det med den yngre generasjonen. De står under dusjene mens alle disse dusjene renner og kjører hele tiden. Og de kan stå å spise på et eple, mens det står å bare renner og renner. Og går ifra dusjen og prater og sånt" (Bergen city 3).

Environmental concerns in relation to energy and water consumption among adolescents seem to be nonexistent here. They also have to be continuously reminded by their parents to not shower too long or too often because it requires a lot of energy. This implies that there is a concern or unease about the cost of energy and water use among the parents, at least enough for them to feel the need to talk to their children about it. The next extract also mentions that he/she takes this generational difference for granted as one behaves differently today than before.

"Jeg har inntrykk av at de unge ikke har tenkt den tanken at de bruker veldig mye energi når de står en halvtime, men at vi må liksom gå en runde der vi må forklare de at vannet krever veldig mye energi og det er den faktoren som utgjør mest, som jeg forstår, oppvarming av vann, til dusj og sånn. Og vi dusjer jo mer og mer. Og der føler jeg at min generasjon har en litt annen væremåte enn den nye, så jeg tar det litt som en selvfølge. Og dette er noe vi må gjøre ofte" (Bergen city 8).

A Bergen participant mentions in the extract below that since water is included in the electricity bill, many use as much hot water as they like. Whereas the electricity companies sent people to households to read from the electricity meter before, this is now included in the bill which might mean it is harder to see what is used today when the bill comes. As such smart meters could be an interesting informative tool.

"Det jeg kom til å tenke på er at vi kan jo bruke så mye varmtvann som vi vil. Siden det er inkludert i denne her strømmen som vi har som vi betaler i husleien som det heter. Og før målte vi og enhver måtte betale for det vi brukte. Det er folk som gikk rundt og leste av disse her. Men det er slutt med nå, siden det ble like dyrt å hyre folk å betale for å lese målerne, som å betale for strømmen. Men det resulterer jo i at alle det at nå bruker jo alle ubegrenset med varmtvann når vi dusjer og sånn og vi tenker ikke på det." (Bergen city 3).

One participant from Trondheim brings up the Norwegian overuse of water in contrast to how San Francisco had to levy taxes on their water due to drought in the region. This tax made people more conscious about with their water use and caused it to decline. He/she mentions that there should be better ways to regulate this overuse in Norway.

"På det tidlige 90-tallet så bodde jeg i San Francisco i California. Og da hadde de hatt tørketid der i nesten seks år. Og da var det sånn at de var nødt å putte en avgift på vannet, sånn at hvis du brukte mer enn så og så mye vann, så ble det dyrere da. Og det er jo sånne ting jeg tenker på noen ganger at vi er liksom så vant til at vi bare kan bruke alt mulig i bøtter og spann. Og så ja, vi får litt dyrere strømregninger da, fordi det var så kaldt en vinter. Men det må jo finnes flere måter å klare å regulere litt det der overforbruket som vi har i Norge. For det er jo et overforbruk til en viss grad. På vann, og så ja, i USA eller California så var det fordi det selvfølgelig var tørketid, men det gjorde jo susen det. Folk ble veldig nøye på hvor mye de dusjet og sluttet å ha levende gress holdt jeg på å si, rullet ut sånn juksegress. Og de hadde fortsatt en god levestandard" (Trondheim city 8).

5.1.5 Abundance of energy sources and electricity prices

One of the more important characterizations of Norwegian energy culture is the abundance of energy sources such as oil, gas and hydropower. Since electricity is sourced from approximately 96 percent hydropower, and has been historically cheap, people have become accustomed to being able to use a lot of electricity for illumination, hot water and other household uses, as well as building poorly insulated houses without having to worry about electricity prices. In the first extract below, a participant explains how Norwegians have never been used to saving energy because it has never been necessary, which is an belief that Norwegians have been raised with.

"Generelt så har det vært mye strøm. Det ser vi jo på diskusjonen her også. Og vi har vel vært oppdratt og lar gjerne så lysene stå på i alle rom. Vi bor i et mørkt land og vi skal ha det varmt inne og vi skal ha det noe å 20 grader inne. Og så videre. Så jeg tror at det er en endring på gang hos folk ikke sant. Men jeg tror vi ligger ganske langt tilbake her i forhold til ganske mange andre land. Samme er det også med vann. Vi bruker det vi er vil bruke og ferdig med det. Vi er ikke vant til å spare. Vi har ikke trengt å spare. Vi har nok energi i det her landet" (Oslo rural 3).

"Men vi henger igjen med dårlig isolerte gamle hus, dårlig isolert, fordi det ikke var lønnsomt å isolere det, det var ikke nødvendig. Fordi strømmen kostet nesten ingenting" (Bergen rural 4).

"Jeg tenker at vi nordmenn har vært vant til å sløse veldig energi, for i hvert fall var det jo aldri snakk om at strømregningen var dyr, eller at det var dyrt. Man kunne jo bare bruke" (Tromsø city 6).

This next quote refers to how Denmark and Germany have had different prices compared to Norway, which has led to a habit of turning off lights.

"Nei, jeg tenker som så at vi Nordmenn har fra gammelt av, vi er preget av at vi har hatt god tilgang på kraft. Og til en relativt grei pris. Ikke det at jeg vet hva strømmen kostet for 40 år siden. Men det var ikke et tema før. Når du snakker om Danmark og Tyskland og sånn så har de vel helt andre priser på strøm. Som gjør at alle gjør det til en vane å slå av lyset." (Oslo city 6).

The fact that electricity is taken for granted by Norwegians, who have been spoiled with abundant natural energy resources was talked about in nearly all focus groups.

"Jeg tror at vi har tatt strøm for gitt, fordi at det er en naturresurs her i landet. Det er veldig ren resurs, elektrisiteten" (Trondheim city 5).

"Men andre land, jeg er enig med deg at vi skal ikke fryse, men vi har bare hatt så, vi har ikke tenkt på det for det har vært så billig. Men andre land har veldig høye kostnader på å fjerne varme. Og det slipper jo vi da" (Tromsø rural 7).

Furthermore, several participants perceive electricity to be green, which influences their energy use as illustrated in the first extract below. However, the direct

reply of another Trondheim participant shows that some were aware of the changes resulting from market liberalization. The last extract from Bergen also exemplifies this.

"Det er jo ikke så miljømessig, så er det jo ikke så veldig skadelig hvis man bruker så mye strøm, vi har jo tross alt vannkraft her i landet da. Så vi forurenses ikke på den måten. På samme måte som en bil vil gjøre" (Trondheim city 2).

"Ja men, der må jeg bare arrestere deg. Fordi at det er riktig at i en periode så var 99% av strømførbruket i Norge, det var styrt av vannkraft på oppvarming og sånt. Men etter at systemet med statlig kontroll og sånn gikk over til mere privat styring, så eksporterer vi jo mye strøm. Og det betyr at når vannmagasinene går tomme så importerer vi jo strøm fra svenske atomkraft og til og med kullkraftverk ute i Europa har vi importert strøm til Norge fra. Så det er en myte som er viktig å avlive altså" (Trondheim city 9).

"Norge er vel kanskje litt spesielt på at vi er litt bortskjemt i gamle dager, når det var veldig billig strøm. Ekstremt billig strøm. Så har det forandret seg nokså dramatisk og det kommer til å forandre seg i fortsettelsen. Slik at, jeg er ganske sikker på at om en generasjon så har strøm og energi i det hele tatt steget meget mye mer enn alt annet i pris." (Bergen rural 4).

Abundance of energy sources has historically led to cheap electricity in Norway, which was below the average OECD price until 2003. Since then, increasing prices have not encouraged Norwegians to save energy, but only to complain. This is illustrated in the following discussion between participants from Trondheim.

"Høye strømpriser er jo bestandig et tema i nabolaget" (Trondheim city 5).

"De klager jo over at det er dyrt. Og så går det over igjen" (Trondheim city 5).

"Jeg synes det er mest sånn generell klaging over strømprisene" (Trondheim city 3).

"Vi kan ikke gjøre noe med det vi bare sutrer og syter og klager" (Trondheim city 3).

"Typisk nordmenn. Veldig typisk hvordan det er" (Trondheim city 5).

"Ja det var akkurat det samme som vært sagt her at man diskuterer strømprisene framfor sparetiltak. Sparetiltak får man i brosjyrer. Strømprisene diskuterer man" (Trondheim city 7).

Another interesting characterization was the fact that there was almost one person in each group mentioning how Norwegians can afford higher electricity costs, so that complaining is easier than actually doing something when comfort is prioritized above all else.

"Jeg tror ærlig talt at smerteterskelen vår ligger mye høyere, men terskelen for å syte og klage, den ligger veldig lavt. Der er vi raskt frempå, hvis bensinprisen stiger en krone eller to og at strømprisen stiger littegrann. Terskelen vår ligger mye høyere, før at økonomien vår kollapser. Det tror jeg ærlig talt. For vi kan forsake mye for å beholde den komforten med å ha det varmt og den komforten med å ta seg fram fra det ene punktet til det andre punktet. Det er min holdning oppe i det" (Trondheim rural 5).

Some participants mentioned that they have tried some energy saving practices, like turning off lights during the winter when the prices are higher, though these efforts

seem to be short lived. The following excerpt shows how the media influences people to save electricity.

“Pris er jo en faktor. Hvor mye ting koster. Når de store overskriftene i forhold til voldsomme strømpriser kommer og sånn, så merker jeg jo at selv de yngste barna på en måte. Da skrur vi av lyset. Akkurat de to døgnene” (Trondheim rural 7).

Finally, one of the more interesting quotations includes remarks on the history of Norwegian energy culture along with references to market liberalization. This extract illustrates very well why, and how, electricity became abundant and cheap as a result of the building of numerous hydroelectric plants from 1960 to 1990.

“Nei, altså, på grunn av de store utbyggingene av nettet som skjedde her opp i nord i hvert fall, på 50-60-tallet, det medførte jo da at strøm ble et vanlig forbrukergode. Og det var rikelig utav det. Det var ingen konkurranse i markedet egentlig, det ble satt en pris og den skulle dekke utgiftene. Men så kom da energiloven som åpnet for konkurranse. Ikke bare mellom kraftverk og landsdeler, men også mellom landene. Og gikk inn på den nordiske børsen. Det har jo presset prisen opp. Men før energiloven kom, så var det rikelig med tilgang på kraft, har jeg inntrykk av, og da kunne man bruke nær sagt begrenset” (Tromsø city 4).

Although this theme does not point to specific social practices, it is probably one of the more important reasons for today's energy culture. The development of the hydroelectric power network set up a particular energy regime in Norway that enabled access to abundant amounts of electricity. This resulted in a particular and unusual energy behavior, such as heating a home solely with electricity. Before market liberalization, people could use as much energy as they wanted at a fixed price, but now that liberalization also brought competition prices have increased. Following rational choice theory, one would assume people would save more due to this change. In fact, energy behavior seems not to have changed, as many use electricity as if it were still the 1980s. When people do show concern, it is typically only during the colder weeks of winter when the media is talking about how prices have risen, but they easily forget when winter is over. Thus, we see that the hydropower regime has indirectly enabled certain social practices to develop, such as showering for a long time and heating indoor spaces to over 22 degrees Celsius. The culture of electricity use has become normalized through practices and routines. Without the development of the hydroelectric power network, it is doubtful that Norway would have had this culture of thoughtless energy use.

5.1.6 Nature, traditional lifestyle and everyday life

There seems to be a contradiction inherent in the Norwegian culture, where on the one hand there is a desire to be close to nature, and on the other hand, there is an increasing dissociation between Norwegians and nature, especially in everyday life. Being close to nature and having access to the unspoiled wild comes from the nature romanticism of the 1800s and the building of Norwegian adoration of nature that became so fundamental in the development of national identity and independence from Denmark (Witoszek, 1997; Eriksen, 1993). From this; nature has become entrenched in Norwegian national identity. However there might be recent trends, as illustrated in the quote below, that people seem not to care as much anymore about nature and its products, referring to how few grow potatoes or want free berries.

“Jeg tror det der sitter langt inne hos veldig mange. At man sier man er opptatt av naturen fordi det er vi liksom oppdratt til, men vi gir fullstendig pokker i det daglige, egentlig, når det kommer til stykket, veldig mange. Når man ser hvordan dette landet har blitt så skjønner jeg at det er ikke veldig mange som bryr seg, når det egentlig kommer til stykket. Og det er ikke mange som dyrker potet lenger. Og plukker bær. Folk vil ikke en gang spise plukkede bær. Jeg har en venninne som plukker masse bær, og som vil gi bort. Folk vil ikke ha blåbærene hennes” (Tromsø rural 7).

Furthermore, there seems to be a Norwegian double standard in the culture, mentioned by the following participant as a paradox. On the one hand, there is a “not in my back yard” mentality concerning nuclear power and gas where Norwegians do not want it in their back yard, while at the same time, they have no problem exporting the gas or importing nuclear power. This may be because Norwegians perceive their country to be filled with unspoiled nature, however their “distance” from the power grid and unconscious use of energy through the services it provides, makes them seem not so logical.

“Ja, men moralen... Det blir litt vanskelig for meg for det er jo en masse paradokser ute og går. For eksempel det her med gass. Vi kan ikke lage elektrisitet av gass, det går ikke for da slipper vi ut alt for mye Co2. Men vi kan selge den til utlandet og dem kan gjøre det. Ikke sant? Vi kan ikke produsere atomkraft for det er så fy fy, men vi kan importere den i fra Sverige, fra Russland og fra Finland. Det går så bra så. Da kan vi bruke det. Så vi er litt sånn flink her i landet også” (Tromsø city 4).

Connected to nature are references to a traditional or simple lifestyle, cabin life and childhood memories. Though the interview material only had approximately 10 people who mentioned they have a cabin, it is well known that cabin life is important to many Norwegians. In fact, in 2013 there were 413,114 registered cabins in Norway (SSB,

2013). According to Müller (2007), there is no other place in the world where cabins are as common as in Norway. The reason for this may be complex and therefore out-of-scope for this thesis, but it is argued it has to do with more the availability of more free time due to high incomes and work flexibility (Skjeggedal, 1999). The reason for bringing this up is to give background to the extracts on this theme, as several participants refer to their cabins when talking about the simple life and childhood memories. The ideal of the cabin is linked to Norwegian traditional values such as closeness of nature, simplicity and the simple life (Witoszek 1997; Vittersø, 2007). The extracts below are taken from a conversation between the interview leader and participants from Tromsø. They illustrate very well how the simple life is appreciated in a holiday context, but that this changes with the return to everyday life.

“Vi har hytte som ikke har strøm, ikke har innlagt vann, ikke har toalett, altså vi har utedo. Og vi elsker å være der. Altså ungene synes det er bedre å være der enn å dra til Syden, så alt går. Og vi lager mat på gammelt vis, vasker opp koppene på gammelt vis, fyrer” (Tromsø rural 6).

“Er det mulig å overføre den mentaliteten tilbake til bylivet igjen?” (Interview leader)

“Det blir jo helt annerledes når vi kommer tilabake til byen” (Tromsø rural 6).

“Det må jo nesten bli sånn, da skal vi ha en lørdag der vi har to timer der vi slår av strømmen. Det må liksom bli på det nivået tror jeg. Ta en Nicaragua liksom” (Tromsø rural 3).

“Det der er faktisk riktig, jeg er helt enig. For jeg gjør det samme når jeg er på hytta. Da kløyver jeg all veden for hånd. Det er ikke for at vi ikke, vi kunne godt ha fått den ferdig i sekker, men jeg synes det er god trim å kløyve ved” (Tromsø rural 5).

“Men det er jo forskjell på hytta og hjemme og livet er jo forskjellig på hytta og hjemme. Og det er ikke sikkert veldig mange, som ikke har tid til å piske kremen for hånd, og elte brøddeigen for hånd. Så det er på en måte litt det der med at dagens menneske er vant til at alt skal være så lett. Det skal være to minutt så er det ferdig. Da skal det være, da er det et elektrisk redskap som trengs, så det blir nok en utfordring og skulle få overtalt folk til at nå skal du stå med håndvispen, selv om det kanskje er hverdagstrim” (Tromsø rural 3).

There is a contradiction between the easy and efficient day-to-day life and the more complicated and time-consuming life required to survive visits to the cabin, where at the same time it is the simple life that matters. Traditionally, cabin life has been associated with “back to nature” primitiveness and outdoor recreation, where the enjoyment of nature plays an important part (Vittersø, 2007). Being physically separated from the pressures of everyday life, practices connected to what is perceived as wasting time such as whipping cream by hand or chopping wood, become connected to leisure time and enjoyment while being at the cabin. Social norms are at play here, as leisure

time and everyday time are strictly regulated, at least in a way so that Norwegians know what is to be expected when they are at their cabin or at home.

The simple life and “how it used to be” were also frequently mentioned in connection to childhood memories. The quotations below illustrate how social practices have changed from one generation to the next where, for example, social interaction around the home seems to be less valued today than before. Instead of using a dishwasher, which is typically used today because it is practical and saves time, the family in the first extract below did the dishes by hand and thus having a social interaction. This missing interaction may have led to people seeking to fulfill their need of social interaction through other practices such as shopping, as earlier described. The second extract illustrates how positive childhood memories are described about a time when less electricity was used. Also, social interaction is described as more common then, as people gathered in the kitchen because it was one of the few rooms that was heated.

“For jeg husker jo fra min barndom og ungdom. Vi hadde jo ikke oppvaskmaskin. Så når vi hadde spist middag, så sto vi gjerne to, om det var to søsken eller far og jeg eller mor og jeg vasket og tørket opp. Altså, det er jo nesten litt sosialt det og. Og den sosiale biten der, den har vi ikke lengre. For vi putter alt oppi oppvaskmaskinen og ferdig med det” (Oslo city 5).

“Jeg er vokst opp i en ganske enebolig, bygd i 1980 og vi var vant til å ha det godt og varmt hjemme og så kom vi ned til bestemor på Sørlandet som bodde på en gård, der våningshuset var bygd i 1843 og vi var vant til at hjemme hadde vi det varmt i alle rom, men der nede så hadde vi det varmt på kjøkkenet. Og muligens i den ene stuen, men ikke i alle rom. Og det var mørkt. Og det syns vi jo, vi trodde mormor var fattig vi som ikke hadde råd, som hadde det mørkt i en del rom og kaldt i en del rom. Men så fant vi ut etter hvert at det var jo ganske hyggelig for da møttes jo alle på kjøkkenet. Istedenfor at noen satt på rommet sitt og noen satt der og noen satt på tv-stua” (Oslo city 3).

In order to save time in day-to-day life, people use dishwashers, washing machines, tumble dryer and other time saving appliances. Saving time is seen as valuable. The perceived scarcity of time and difference between work time and leisure time emerged early in modern society (Ellingsæter, 2005). These household appliances are termed convenience devices (Shove, 2003), but were not associated with time until the 1960s with the emergence of convenience foods and convenience stores (Warde, 1999). Today, these devices are seen as part of a comfortable and convenient life and are even seen as normal and necessary.

“Ja, spesielt det med oppvaskmaskinen og tørketrommelen, pluss vaskemaskinen, de maskinene går jo hele tiden føles det som. Men på en annen side så er man ikke så flinke til å tenke etter,

man bare hiver det inn. Pluss bilkjøring, Jeg tenker egentlig alltid når jeg setter meg inn i bilen at "uff, dette burde jeg ikke gjort", jeg burde kjørt, nei jeg mener jeg burde tatt bussen eller gått. Men det er veldig praktisk og så går det veldig raskt. Så hvis bussen stoppet utenfor døren og alltid hadde tatt meg med dit jeg skulle eller stoppet når jeg ville så, ville jeg kanskje vært litt flinkere til å. Jeg er veldig flink til å skylde på alle andre ting. Men man blir litt sånn, man søker litt komfort og bekvemmelighet. Man har dårlig tid og man skal rekke ditt og rekke datt og da tar du den enkleste løsningen. Jeg føler at jeg har litt dårlig samvittighet. Men det blir litt sånn, du bare gjør det for det er så greit" (Oslo city 3).

"Jeg tenker sånn i det daglige da så irriterer jeg meg over vaskemaskinen og tørketrommel som går i et eneste sett. For det føler jeg at, det er jeg som trykker på knappen og det er jeg som setter det i gang. Men jeg må nesten gjøre det også. Jeg har stor familie" (Oslo city 7).

"Det går sikkert og på verdier. Håndduker skal være myk og deilig, dem skal ikke være, dem blir så tørr og hard av å henge. Hvis du kjører dem i tørketrommel så blir dem sånn mye mer, de holder seg mykere. Som man unner seg" (Tromsø rural 3).

These extracts illustrate how people feel about their washing machines and tumble dryers running all the time. As participant 3 says "one has to do it", implying a sort of lock-in to this behavior, which occurs due to a perceived lack of time, as well as social norms and habits. There is a social practice at play here, where *materials* are the devices, *competences* are their skills about using these devices, and the *meaning* or *interpretations* are their ideas about what constitutes clean clothes and freshness, all in order to fit in with everyday society. Practices are routine and the first extract mentions how one is unreflective about their actions, implying habitual or routine behavior is in play when using these devices. Lastly, notions of comfort and convenience are used as explanations for why people want their towels soft, or why they take the car instead of the bus. These are notions that, to a certain extent, are culturally defined and socially organized. Comfort and convenience are also prioritized and one may often excuse oneself by saying one is allowed to enjoy oneself ("*som man unner seg*" Tromsø rural 3), some pleasures.

6 Discussion

This chapter is divided in four whereby the first section sums up and discusses the main findings and how they relate to previous research. The second section looks to the integrated model as briefly touched upon in the theoretical chapter, and discusses more deeply how to connect social practices to individual behavior and how culture fits in. The third section deals with the methodological implications of this study and finally, the fourth part discusses the implications for policy and practice as well as some interventions and solutions.

6.1 Summary of results and relation to previous research

An analysis of the focus group study has brought compelling insights into what individuals consider to be typical Norwegian energy culture. The participants seemed to be aware of Norway's high household energy use and different energy practices compared to other European countries. This awareness is most likely due to the high Norwegian mobility culture as there were several participants that had traveled to many other countries as well as participants that were either foreign or have had visitors from other countries. Through meeting other cultures, it is easier to see what is done in one's own culture, and most of the participants accordingly described Norwegian energy culture as thoughtless and wasteful of water and electricity, with a typical consumer attitude including a buy-and-throwaway mentality, desire for large houses and the perceived need to have the latest gadgets.

The archetypical aspect of energy culture seems to be illumination. Although it might not be the most energy intensive activity in a household, it can add up, especially if the typically many lights around the house are on most of the time. Furthermore, illumination is a visible indication of the wastefulness the participants pointed out to be a part of the Norwegian culture from the consumers' side, but also from the public authorities' side. The participants also mentioned coziness frequently in relation to illumination. This was also discussed in relation to heating where the expression "*godt og varmt*" (*warm and snug*) was typically mentioned. The fact that Norwegian homes are extremely light and heat intensive compared to other countries is also in line with previous research, such as the qualitative study of Wilhite et al., (1996). The fact that

illumination and heating is maintains an emotional and symbolic value is also in line with their comparative study of Norway and Japan, where they found a strong social significance of coziness in Norway, which leads to overheating and over-lighting as insurance against *faux pas*. They argue that it has become almost mandatory to have a state of comfort in Norwegian living rooms, which is why visitors often say “*nå koser vi oss*” (now we are having a cozy time). Coziness has become what Shove (2003) and Wilhite et al. (1996) call a cultural energy service, in which is defined as a set of energy use behaviors rooted in the cultural, social and symbolic presentation of the home. The example of Norwegians using table and spot lighting around the house to create a certain ambiance and coziness illustrates a cultural energy service. Interestingly, Wilhite et al’s study (1996) showed how the Japanese, as opposed to Norwegians, prefer fluorescent lighting and brightness and that the incandescent lighting make them feel depressed. Also in line with the findings here, their study showed how energy practices tend to vary according to cultural contexts. More recent research of Winther and Lesdain (2013) has also found that electricity use is cultural. For example, they found that the French consume energy more frugally, as they perceive electricity as a necessity that is not a common good, and thus they have a stronger culture of energy savings than Norwegians.

The fact that Norwegians use space heating and keep most of the rooms heated is also in line with research by Wilhite et al. (1996). Two thirds of the total household energy use in Norway (not including transport) is used for space heating, although it is argued that this is decreasing with the expanded use of passive houses and heat pumps (NVE, 2012). In contrast, the Japanese only heat up one room, which they use to socialize in. This social heating practice seems similar to how Norwegians used energy historically, where they heated the kitchen and everybody gathered there, or other practices that occur when Norwegians go to their cabins and live the “simple life” today. There seems to be a Norwegian mismatch between the ideal *simple life* as a *leisure activity*, where closeness to nature is sought after, which contrasts sharply with the wish to have a comfortable *daily life* that is typically very energy intensive. This might have to do with the perceived lack of time in daily life, where convenient devices are needed to save time, while one has a lot more time at the cabin. This cultural difference between Japan and Norway, and Norway before and today might also have to do with collectivist

versus individualistic cultures. Asian cultures are known to be more collectivist, where doing activities together is valued, while, according to social anthropologist Thomas Hylland Eriksen, Norway's culture has become more Americanized and hence individualized since the 1950s (Eriksen & Neumann, 2011).

In previous research, such as Wilhite et al. (1996), Aune (1998, 2007) and Winther & Lesdain (2013), it has not been mentioned how some Norwegians keep a high indoor temperature for their toddlers crawling on the floor, nor how illumination is used to communicate that someone is home as a preventive measure against burglars. These practices are probably not new cultural patterns. Illuminating ones home while on holiday is recommended as a preventative measure against burglars by insurance companies (e.g Storebrand Forsikring, 2013) and the media, where there are often articles circulating with references to a "burglar wave" and "this is how you avoid break-ins during the holiday" (Dagbladet, 2012). These media warnings and tips from trusted sources such as insurance companies are injunctive norms, and culturally interpreted. This social norm might not make a huge impact on energy consumption compared to heating, but it shows how much influence such messages in the media and from other trusted outlets can have on energy use. That some believe it is necessary to increase the indoor temperature so that they can have their children on their floor is also interesting. Although it is not clear whether this is a new practice, it seems to be a social norm amongst mothers, and thus operating on the group level. If this practice were to become diffused on a more national level, it could be a concern for increased national energy use, as heating is very energy intensive.

Showering and hot water use was another feature attributed to Norwegian energy culture, which has important implications for energy efficiency, as one third of total household energy use is used to heat up water (NVE, 2012). This statistic is independent of whether or not it is an older or newer residence. The fact that Norwegians, in general, shower a lot can partly be explained by why teenagers shower a lot. Assuming there are similarities with Danish teenagers, one can look to Gram-Hanssen's research (2007) on how teenage shower habits are linked to cleanliness practices that are strongly connected to cultural and social processes. As teenagers enter the teenage period, family and friends socialize them into the habits of showering and changing clothes everyday, where the

social sanctions for not doing this are strong. Thus, many teenagers continue their showering habits throughout their adulthood, and in turn influence their friends and family. Showering everyday is seen to be part of growing up and according to one of the teenagers “something all grown-ups did”. It would be unthinkable to show up to school without showering first. This type of norm is also in line with some of the focus group participants’ perceptions. Showering is part of cleanliness practices (Shove, 2003). Although my analysis did not find specific links to cleanliness except for showering, one can look to research by Klepp (2003) who found that notions of what was considered hygienic and clean in Norway changed in the late 19th century and had to do with social status and appearances, as well as with avoiding disease. Cleanliness is thus subject to historical and cultural evolution as well as interpretation and notions of what are considered clean, which changes between generations, cultures and context. For example, several of the focus group participants mentioned how they used to take baths only once a week when they grew up, as opposed to today. Thus, something has changed, but none of the participants were asked why or discussed it, which might be because it is seen as a natural change that does not raise any questions.

When considering the impact of the energy market on consumption, the results show there were several factors worth further discussion, many of which are in line with research from Wilhite et al. (1996), Aune (1998, 2007), Aune & Berker (2007), Næss & Ryghaug (2007), Aune et al. (2011), Klöckner (2011) and Winther & Lesdain (2013). Firstly, one of the most important factors was how the particular regime set up with the hydroelectric power network between 1960-1990 enabled people access to abundant amounts of cheap electricity. Although prices since 2003 (SSB, 2011) have increased, the participants still use a lot of energy, which might be contributed to the high-income level in Norway, which makes it more affordable to spend more on energy compared to residents of other countries. This consumer behavior, then, does not match the initial expectations of energy market liberalization. This is in line with research by Ryghaug & Karlstrøm (2011), who found that consumer energy behavior reflects what is expected by economic theory only to a limited extent. Furthermore, electricity was referred to by almost all focus groups as “green” (*grønn*) due to the high percentage of hydropower in the Norwegian electricity mix. One might thus be inclined to argue that Norwegians are

generally not aware that there is still 4 percent that comes from more polluting sources. However, as mentioned earlier there were some that did mention how electricity also consists of nuclear and/or coal energy. This makes it difficult to conclude how much Norwegians are aware of when it comes to their energy supply, or if they just want to *believe* that the electricity they consume is clean, since nature and notions of fresh air and clean rivers are bound up with their national identity. Furthermore, it doesn't help that people are generally far removed from the production of energy, which might make it easier not to think about how one's own household consumption actually requires the exploitation of natural resources. In the end, if people do not want to believe the facts or somehow unconsciously refuse to acknowledge them, there may be a kind of *collective* or *cultural denial* going on. According to cultural risk theory (Zerubavel, 2006), new information that does not fit with existing ideas becomes collectively denied, while the prevalent ideas stay strong. Interestingly, Winther & Lesdain (2013) argue that Norwegian's view of consuming only pure hydropower has turned out to be a barrier against accepting the electricity labeling scheme where GOTs (Guarantees of Origin) are traded with Belgian and German customers, among others, because the Norwegians do not really see the point if their electricity is already green.

Except for certain Tromsø participants who sometimes were without electricity due to storms, there was not much risk seen connected to electricity. This perception is also in line with Winther & Lesdain's (2013) study of French and Norwegian households' view of global warming and electricity use. In this case, the French do not see electricity as a common good, but rather as something that is *physically* and *financially* risky, but nonetheless necessary. It is understood as physically risky because French electricity is based mainly on nuclear power, and so there is an associated risk of nuclear disaster attached, as the risks are higher at the production and waste stages but lower at the consumption stage, and there is a financial risk because it is expensive.

In a qualitative study between 1991-1995, Aune (1998) also found that Norway was seen as being filled with infinite sources of clean available energy in the form of hydropower. Aune et al. (2011) describes that period as a *comfort oriented energy culture*, which refers to a culture where leading a comfortable life is expected and taken for granted. She thus also shares similar views as discovered by Wilhite et al. (1996,

2000) as well as voiced by many of the focus group participants. Furthermore, just as people in the early 1990s said it was fine to allow oneself some pleasures (Aune et al., 2011), so did the focus group participants, which is very interesting as it shows there are still strong similarities between the two, with more than twenty years between them, suggesting that the energy market behavior initially intended has not yet been achieved.

Across the factors mentioned above, I additionally found social practices, social norms and habits to be very influential in creating and sustaining the Norwegian energy culture. Household energy consumption is made up of various social practices such as washing, showering, illumination, space heating and general shopping; these results are in line with Shove's articles (2003, 2010), although hers are from the English consumer perspective. Most of these practices are not something that is acted upon consciously, but are habitual and perceived as necessary. Often it is the services energy provides that people want, not the energy itself. In general, Norwegians want to be comfortable, to have it cozy and warm, and to have convenience in the day-to-day life that is seen as often very stressful. Yet, these notions are socially constructed and culturally interpreted. Energy use is also governed by the need to accomplish tasks, so people look for convenient and time saving appliances, such as the dish washer (Aune, 1998).

How different types of behavior have been attributed meaning that does not necessarily belong to it is also very interesting. For example, illumination and heating seem to signify something beyond the practical, having additional meanings of safety, well-being and coziness. In this way, energy provides much more than just the practical. The notions Norwegians have about comfort, coziness, convenience, and to a certain extent cleanliness, have a huge impact on day-to-day life, mostly because they stand out as cultural barriers against lowering energy use. Aune & Sørensen (2007) and Wilhite et al (2000) argue that increasing comfort requirements are likely to be the main driving force behind the increasing demand for energy in Norway today. Comparatively, in a psychological study of American couples, it was found that comfort was the most important determinant for energy use, which was an attitude so consistent that neither time, location or the availability of energy could change it. (Becker et al 1981, 1979). Once values concerning energy and consumption are formed, they tend to be extremely difficult to change, especially if they are transferred between generations, such as the

Norwegian comfort-oriented culture that includes, for example, illumination practices. Furthermore, people tend to rationalize their decisions afterwards, emphasizing the positive aspect of what they chose and the negative aspect of they did not choose. Over time, people start to see their selected option as superior, which serves their need for self-justification instead of objective fact seeking (Stern & Aronson, 1984; Sovacool 2009). This would infer that Norwegians might be resisting change to their energy culture because they are committed to what they have been doing for generations.

As a conclusion it can be said that comfort, coziness, convenience and to a certain extent cleanliness are the main characteristics of Norwegian energy culture, together with a strong believe in availability and sustainability of electricity. Many of these aspects have been found already in previous studies but also new energy intensive practices like increasing the temperature for toddlers and technical gadgets are sneaking into Norwegian society.

6.2 The integrative Energy Culture Model

This subchapter discusses concepts that span the theoretical traditions found in the results and the points of intersection between psychology and sociology. It also refers back to, explains and discusses the integrative model of energy culture as illustrated at the end of the theoretical chapter. This model sees energy culture at different levels of society from the *individual* and *group level*, and *the material* and *technology* to the *policy* and *regulation* regime, which influence those two levels, and each other. Across these circles one can find the *social practice*, of which we all engage in numerous daily. These social practices are conditioned by factors at each of these levels of society, and are nearly always connected to some type of energy use. Energy culture is the result of the linkage between these circles.

The two outer circles of the model are the context and structures where individuals and groups interact. When people engage in various social practices they also use energy, either directly or indirectly. This energy use is made possible by the two outer circles, such as the hydroelectric regime and infrastructure that was set up by policy and regulations, but also through the technological appliances and gadgets that exist in a household that also are influenced by policy and regulation, such as energy efficiency

requirements. The *material/technology* circle includes everything physical that makes energy use possible (e.g money, houses, resources, appliances, heat pumps etc). It also includes Norway's geographical placement and climate. For example, Norway would not have hydropower without its particular geography, and its climate has *partly* resulted in a perceived need of its people to enjoy themselves with lights, warmth and the notion of coziness. Although it is necessary to use more electricity for heating in a cold climate, it is probably not necessary to heat a home to more than 22 degrees Celsius, which is also referred to as *t-shirt weather* by the focus group participants. Geography and climate is one of the more apparent structural limitations of reducing electricity use, and coupled with historically cheap prices, social norms and habits, this results in a lock-in of particularly heating and illumination practices, as illustrated by the results. Designs of material/technologies also influence energy behaviors either towards more or less energy use (Shove & Pantzar, 2005; Aune 2007). For example, a design trend toward larger houses might lead to a path-dependency and a lock-in towards higher space heating. Also, Gram-Hanssen (2010) points out how standby consumption can be partly due to poor design considerations, since many appliances do not allow storing programming once turned off. Thus, to sum up, the outer circles represent the fact that structures and context are influential in the way that they can limit individual choice through geography, climate, socio-demographics, as well as the way energy and water supply systems, cities, housing, regulation and policy are structured and organized.

The next circle, *others/groups* is the group level where one finds values and social norms of family, friends, media and other groups that influence individual behavior and the outer circles. At this level energy use is constructed and interpreted through social norms and values. People share these with the groups that influence them the most and different practices might have different influences. For example, according to Aune (2007) families living together share norms and values, but also according to Gram-Hanssen (2007) social norms amongst teenagers' friends are very strong, especially when it comes to cleanliness and showering. Social norms were referred to a lot by the focus group participants, and this social influence was mentioned especially in relation to illumination behavior, showering and acquiring new gadgets. Without knowing, participants differentiated between descriptive norms (what others do) and injunctive

norms (other people's communicated expectations). This was especially true for public illumination whereby a discrepancy between what the government says people should do (save electricity) and what the government itself does (waste electricity by unnecessary public lighting) almost never led to an individual changing its energy behavior.

Structures and context are also important for the *others/groups* circle. Action or behavior is in large part due to social norms and context, which the SPT reminds us (Whitmarsh et al., 2011). This is in fact a point of intersection between psychology (e.g. CADM) and sociology (e.g. SPT). The psychological understanding of social norms is very similar to common social understandings (Strengers, 2012) or conventions (Shove, et al., 2012). Neither of them would deny that social norms and structures are important for behavior, rather their focus of analysis is different. The CADM, for example, focuses on what resides internally in an individual, but only implies how important the contextual structures are. Cultural influences on individual behavior are mediated through, for example, social norms and what a person believes one can achieve, perceived behavioral control (PBC) and habits. The SPT focuses on the practices, which broadly speaking include context, structures, groups and social norms, and the relationship between them. Behavior is possible due to these factors and it is through behavior that these norms and structures are continued.

It is not only lock-in of structures that limit energy behavior; also routines and habits make it difficult for people to reduce energy use. People are generally do not reflect about their energy use in day-to-day life because it is very tiring to focus on everything one does throughout a whole day, and most energy practices are "hidden" in everyday activities such as washing clothes, cooking and showering. For example, there were several focus group participants that spoke of how they did not know why they had to have it warm inside or why they showered each morning, they just had to because they were used to it. Thus, energy practices are places of strong habitual behavior.

The second point of intersection between sociology and psychology is the practice itself, which is understood from social practice theory (SPT) as a "routinized form of behavior" (Reckwitz, 2002: 249) and the psychological understanding of habits (Verblanken & Orbell, 2003). Both disciplines see habitual behavior not as consciously driven, but as a product of context that is temporal, social, and spatial (Whitmarsh et al.,

2011; Gram-Hanssen, 2008). For example, the over-use of lighting in Norway was referred to as habitual by the focus group participants, while other countries were much better at turning off lights, which suggests different habits and social norms are present in other countries. Foreigners moving to Norway also noticed this cultural difference and were at first frustrated with this practice, but after a while become socialized into the new norms and new habits, and often modified their behavior to the new cultural context. This change, however, might take a very long time as it depends on how strong an individual's values and personal norms are. It was also through habits that the focus group participants saw possibilities of changing their energy behavior referring to how one only had to get an "Aha!" experience and that one had to "wake up" from the habit to move away from it.

Habits were also referred to in relation to technology, although without realizing it, since they were talking about their day-to-day lives and having the perceived need of time-saving appliances such as washing machines. This was also connected to lock-in and social norms of cleanliness, where they "just had to" put on the washer everyday to get clean clothes. This should also be seen in connection with the desire of individuals to get as much done as possible in the shortest time. As people become more dependent on these appliances, their understanding of what is considered normal and necessary will change, which will in turn increase the demand for new technology.

Although the outer circles, social practices and the potential for lock-in might make it seem as though individuals do not have much say in the matter of their energy behavior, this is far from reality. The influences on an individual's energy use vary widely, which makes it difficult to have a generalized energy policy. In the center of the Energy Culture Model we find *individual behavior*, which illustrates how the other circles influence a person's behavior. Internal characteristics make people different from one another at this level. Individuals are not entirely passive and non-reflexive, they also have values, attitudes, intentions, emotions, skills, past experiences, knowledge and personal norms that may be different to the social norms and habits of others. Thus, an individual may not internalize the social norms around them quite so passively. Individuals negotiate with other groups as well as their contextual factors. In the end, they each can have their own specific energy practice because not everyone does the

exact same thing. However, there are a lot that do and hence we refer to an energy *culture*. However, as energy behavior in this model is connected to social practices, it is important to keep in mind that if a person is highly habitualized and thus unreflective about their behavior, contextual factors will be stronger than internal variables. This argument is also claimed by Stern (2000).

As mentioned at the beginning of this subchapter, social practices in this model are found across all circles, or levels of society. Although none of the focus group participants referred explicitly to practices, they did mention how certain behaviors were habitual, while others reflected on how structural factors limit their choices. Most of the illustrated examples in the results chapter are typical social practices (indoor heating, showering, illumination etc.), and they are archetypical examples of the Norwegian energy culture. Consuming energy occurs as part of a social practice. Thus, consumption and its social and environmental impacts are partly a result of the daily routines that people perceive to be normal ways of life (Shove, 2003). A lot of our “needs” for energy use are arguably just “wants” that through social practices have become so normal that we have come to perceive them as needs. Examples of this include showering everyday versus showering once a week, or having a dishwasher versus washing dishes by hand. Often, this happens gradually through introducing new technology as Shove (2003) demonstrated with convenience devices. Our demands are shaped by what we perceive as clean, comfortable, convenient and cozy. This is also temporally, spatially (or culturally) and materially interpreted and possible. For example, is it not possible to shower as much as Norwegians do in Australia where they have limited water supply, which is why their social norms include, to a greater extent, water conservation (Strengers, 2012). This understanding is at the heart of this model, as different compositions of an energy culture system will lead to different energy behaviors. For example, if it had not been for the hydropower resources in Norway, this excessive use of water for showering might not have developed. In the same vein, if Norwegians move abroad they will have to relate to different social norms, resource possibilities, regulations and other factors which might lead to a modification in their individual behavior. The model is thus seen as a system with components that interact and create effects so that change in one circle might lead to

change in others with unforeseen results. As with all systems, this one is more than just the sum of its parts.

6.3 Methodological implications

As is common for this type of research, the results and theoretical framework have come as a result of choices made in the analysis as well as the research process. Due to this strong dependency, it is important to discuss some of the methodological implications related to the thesis outcomes beyond what was already presented in the methodology chapter.

First, when it comes to pragmatic usefulness, or whether the research results can be generalized beyond the specific research context in which it was conducted, I believe this aspect has been fulfilled. Klöckner (2011) admits that since the sample of 70 Norwegians was not a representative sample of the Norwegian population, this might limit the ability to generalize results. As true as this might be, the fact is that a lot of the results were, to some extent, also supported by other research.

The purpose of this thesis has been to provide deeper insights into what characterizes Norwegian energy culture. This does not mean the findings are relevant to everybody in Norway, but more to the population in general. It is likely that some of the characteristics do not apply to some Norwegians. For example, not everybody leaves the lights on all the time or keeps high indoor temperatures. Also, as this sample was not very large relative to the general population, many of the nuances that exist in society might not have come through. Since this was a qualitative study, it was not possible to do a cluster analysis to determine the existence of several energy cultures which other research has shown to exist (Aune, 2007; Aune et al., 2011). A lot of the participants also spoke quite negatively about Norwegians, and generalized quite a bit, but such statements are important, as they are indicative of how people see Norway and its existing social norms.

When it comes to the study's credibility, some reflections have already been mentioned earlier, but I feel it is important to mention again that the values in the results are only indicative, as it is challenging to interpret and categorize personal statements. An example is if one person talks about how teenagers shower way too much and another person replies with "yes, that is true". It is difficult to know if the second person's

response should be counted or if that person only said it as part of a normal conversational response.

The energy culture model can also be argued to have high usefulness, as it is a very general model that at least other countries can relate to. However, one of the disadvantages with models can be that central features are emphasized at the expense of nuances and variations in the participant's experiences (Thagaard, 2003). In this regard, more could have been written about regulation and policy, as well as values, but these were outside the scope of the thesis. Future work could help to elaborate the aspects of the model that were peripheral to this study and draw connections to social practice theory.

A weakness of the initial Enova study by Klöckner (2011) that made it difficult for to go deeper into the social practices of the participants was that there was a lack of follow-up to some of the aspects that turned out to be important for this thesis. For example, responses that seemed to be normal for both the participants and the interviewers, such as showering to get clean, were not further discussed. It would have been more relevant and useful for this thesis if the interviewers had asked more about the participants' everyday lives, such as why they have to shower everyday, in order to better probe why they do what they do. Furthermore, as Aune (1998, 2007) and Wilhite et al. (1996) have shown, the best way to study people's everyday lives and social practices is by observing them, as much of their behaviors are habitual and go unnoticed by them.

6.4 Implications for policy and practice

Arguably one of the most surreptitious impediments of lowering household energy use in Norway today is the locked-in energy culture that includes cultural barriers such as routines, habits, social norms and social practices. Reducing energy consumption in any society requires that policies and strategies be in accordance with the culture in which they interact. Cultural barriers refer to situations in which energy behaviors are influenced in any way by cultural variables, such as social norms, structures and habits that surround consumers but are durable and stable, and thus difficult to change or modify. The integrative energy culture model, as discussed previously, suggests that change in energy culture must come from a multidimensional focus, since change in one

of the circles can lead to changes in others, sometimes with unexpected consequences. The circles are mutually dependent and influence and reinforce each other. Interventions should thus target factors across the system, and aim for change at multiple levels. Nevertheless, as this thesis has shown, social norms, habits and social practices (along with technology and policy) are especially important within energy culture.

As Shove (2010) argues, policy making is dominated by behavioral framings of individuals as agents of change. However, household consumption patterns and energy use cannot be *fully* explained by behavioral theories alone because the scale of inquiry is so wide that richer explanations are needed, such as sociological explanations (Røpke, 2009). Yet, the social practice approach is a relatively new approach to understanding energy consumption and thus its introduction into policy ought to be done at a “practical level, alongside currently accepted models” (Wilson & Chatterton, 2011: 2786).

The government plays an important role in the social and cultural context within which consumers behave. Policies and regulation send important signals to people on societal priorities, and thus heavily influence social norms and cultural expectations. The discrepancy between injunctive and descriptive norms, as shown in the focus group interviews for example, do not lead people to change their illumination behavior. On the contrary, the “do as we say, not do as we do” government signal is a significant hindrance to energy efficiency. Actions must be consistent with policy, if government is to successfully lead by example. This could be done through cleaning up the injunctive/descriptive norm discrepancy and sending clear signals about policy goals, such as through environmental management initiatives and green procurement in the public sector.

Furthermore, the results show that social norms are very important in influencing energy culture and people’s behavior. Psychology studies have shown that it is better to focus on what is desirable in a society and de-emphasize what is not, so as not to draw more attention to what is not desired and indirectly and unintentionally create an inductive norm. As people often follow the crowd (Schultz, 1998), social feedback could be a helpful intervention strategy. A study by Middlemiss (2009), for example, revealed that people modify their practices as a result of involvement in community-based organizations, such as social clubs and schools who are active in sustainability. Learning

by example and taking inspiration and understanding from one's peers could potentially change social norms. Another recent study has show that giving utility customers a bar graph showing their recent monthly electricity use, compared to a comparable, yet more efficient group of neighbors led to a 1-2 percent reduction in their use. This effect even lasted up to a year after the intervention was started (Ayres et al., 2012).

Since the context and structures shape, stabilize and constrain action, often along with technological development over a long period of time (Shove, 2003), considerable reductions in energy use can be achieved by developing appropriate socio-technical regimes (Schippe et al., 2001). For example, Foxon et al. (2008, 2009) suggest a new low-carbon electricity system based on the technological options and governance patterns of either a centralized electricity supply system with low-carbon generation technologies (e.g biomass, wave/tidal power or offshore wind, all of which could be applicable to Norway) where consumers play a demand-response role via smart meters with variable tariffs, or a decentralized system with community-level microgeneration equipment (e.g wind turbines or photovoltaic) that would bring electricity production closer to end-users. This latter suggestion would likely make consumers more aware of their energy use by making energy more visible, and as such it could be a good intervention strategy for reducing energy use (cf. Aasen et al., 2010). The problem with introducing new technology, though, without considering the cultural background of its end-users, is that it could lead to unexpected outcomes. No matter how efficient technologies become, the fact that people could use them for something else, or in a different way than what was intended is a concern that should always be addressed (Wilhite, 2008, 2010; Wilhite & Nilsson, 2008; Aune, 2007).

This is also linked to how social practices can be changed. Shove and Pantzar (2005) argue that the development of new practices has to do with “forging and failing links” (p.58) between the elements of the practice, or as Reckwitz argues (2002): a break and shift in the practice. For example, situations where there is a type of crisis, such as water restrictions, power blackouts, or the introduction of a new appliance, might lead to modified comfort and cleanliness practices (Strengers, 2010). However, practice theorist Warde (2005) argues that introducing new laws or appliances will not change a social practice by itself because the regular performance of a practice sustains and legitimizes it

as a practice. For example, it was long after the invention of the power shower that daily showers became a social norm, as it was initially seen as dangerous for the skin (Strengers, 2010).

Wilhite et al. (1996) suggest that policy should focus on practices that are not that culturally-anchored, such as lighting in Norway, and that change, for better or worse, will happen if the elements of the social practice push in the same direction. To this one might argue that if all elements were to push in the “right” direction in the first place, there would not be a problem. Changes in intervention approach are needed in areas where not everything is pushing in the same direction.

Creating new meanings and associations of what is considered to be Norwegian through informational campaigns could be a good intervention strategy for reducing energy use. However, this might be difficult since the results have shown that nature, hydropower and electricity have been bound up with national identity beginning in the 1800s. Yet, the notions that exist around the simple life - about going back to basics and doing everything the hard way - could be taken back into everyday culture. A practical implementation could be instituting days where people pretend to be at the cabin and turn off all electricity, though this should be well studied first as it might backfire with an increase in candles and wood heating leading to a rebound effect⁵. Another suggestion could be to use people’s emotions to create associations, as behavior is also driven by childhood memories. Thus, a commercial could, for example, show a family gathering in the only heated room of the house, thus rekindling associations of a life with less energy use like when they were growing up. Many information campaigns speak to people’s rational side, but could in addition use emotions and other connections to widespread understandings of what is considered comfortable, clean, convenient and cozy. In this way, it may very well be possible to associate the good life provided by less energy use.

Since energy practices are very much habitual and part of our unconsciousness, it they are one of the biggest barriers against energy efficient behavior (Gifford, 2011). Habits are very difficult to break, as very little intention is put to these behaviors (Verplanken & Wood, 2006). To break a habit, the automatic association one has to an

⁵ A rebound effect is here understood as an increase in consumption as a result of decreased costs from direct energy saving following the introduction of a new energy efficient technology, can lead to increased energy use despite increased efficiency (Wilson & Dowlatabadi, 2007).

action must be broken. The habitual behavior has to be disturbed, which can be done by moving to a new environment where one has to consciously think about how to get from one place to another (Aarts & Dijksterhuis, 2000), or through the experience of life changes such as motherhood, taking up a new job, or moving house. As such, this seems to be very similar to the social practice understanding of crisis and to “forging and failing links”, as previously mentioned. Habits are important to understand since they can undermine intentions and motivations to change. As suggested by some focus group participants, it is through habits that one can change and they only need one “Aha!-experience” to make them conscious of their action.

So, how do we create the conditions for people to change their energy-intensive, culturally-anchored practices towards less energy-intensive ones? As expected, there doesn't seem to be a “silver bullet” answer to this question. In fact, “silver bullet” interventions typically fail because they do not consider the full range of societal and cultural influences, for example by only looking at making economically-rational changes, or expecting that changing attitudes also changes behavior (Dietz et al., 2009). The focus group participants mentioned, for example, that they would simply pay more if the electricity price increased, and that sacrificing comfort standards are not an option. It is not just more information, the right incentives, or saving money that will work, since social practices and cultural aspects act as barriers. Policymakers should keep in mind that designing effective intervention strategies is complicated, especially as policies can lead to unexpected effects. For example, the liberalization of the energy market was also designed for the eventual export of hydropower, but instead it has led to the opposite effect in which coal and nuclear power is imported into the Norwegian market under certain conditions. Policymakers should thus look to psychology research on interventions to reduce energy use, but also including collaboration with sociologists and technologists to get the full range of energy culture attributes to better inform where, when and how to intervene.

According to a household study by Dietz et al. (2009), the most effective policy interventions to reduce energy use include a combination of three factors. First, a combination of several policy tools should be used, such as information and incentives which address many behavioral change barriers. Second, the use of social marketing like

mass media appeals and community-based approaches should be implemented. Finally, multiple targets should be addressed, including individuals, communities and businesses. This three part approach aptly sums up the learnings from the energy culture model and exemplifies the tenants for using energy culture as a facilitator, rather than obstacle, for positively influencing energy behavior.

7 Conclusion

In an attempt to expand the realm of work on household energy use within the field of Industrial Ecology, this thesis takes a cultural perspective of energy use by employing theoretical foundations within the social sciences. Research on energy use has traditionally been focused on technological and economic solutions with an understanding of consumers as purely rational beings, whereby energy efficiency holds the answer to reducing energy use. However, as this thesis has shown, efforts to reduce energy use in households must also include looking to the social and cultural context within which consumers live, as well as psychological constructs such as habits and social norms.

Through analyzing the empirical evidence using qualitative thematic analysis, strong indications of energy being culturally and socially constructed and entrenched in social practices were found. Much of the practices revolve around perceptions of what is seen as clean, comfortable, convenient and cozy. Illumination and space heating, for example, are the archetypical characteristics of energy culture and seem to be deeply connected to notions of coziness. These perceptions are also part of the Norwegian national identity and as such can be very difficult to change.

The development of an original energy culture model has also been explained and shown to be useful in exploring energy culture as well as needed interventions to reduce energy use. This model illustrates a clear general structure for building and analyzing energy culture. By seeing energy culture at different levels of society, from the individual and group level to material and technology to the policy and regulation as well as social norms and habits, one can see how Norwegian energy culture is built up and how its different aspects relate to each other. Across these factors, one can find the social practices, of which we engage in numerous daily. These practices are conditioned by aspects within these different levels of society and are nearly always connected to some type of energy use. They are mutually dependent, influence and reinforce each other, and a change in either one can lead to change in others.

The model emphasizes the multidimensionality of energy culture, and thus highlights the need for multidimensional solutions. For example, reducing energy use is not just

about more information, the right incentives, or saving money, since social practices and cultural aspects act as barriers. Policymakers should keep in mind that designing effective intervention strategies is complicated, especially as policies can lead to unexpected effects. For example, the liberalization of the energy market was also designed for the eventual export of hydropower, but instead it has led to the opposite effect in which coal and nuclear power is imported into the Norwegian market under certain conditions. One should also analyze how energy is culturally interpreted when introducing new technologies and policies as it is problematic to introduce general energy policies in atypical cultures such as Norway, where electricity is such a significant energy carrier. The fact that there is a very visible discrepancy between injunctive and descriptive norms in Norway related to illumination is a barrier to energy efficiency. Thus, policymakers should first and foremost start there. However, there is no “silver bullet” solution for reducing energy use, so interventions must also be checked continuously for their intended and unintended impacts and to correct any mistakes.

Policymakers should look to psychology research on interventions to reduce energy use, such as Dietz et al., (2009) three factors for influencing policy, but also by including collaboration with sociologists and technologists to consider the full range of energy culture aspects to better inform where, when and how to intervene.

When it comes to future research, the energy culture model could certainly be further developed, as it was not possible here to go deep enough to incorporate many of the nuances of energy culture. Furthermore, it would be useful if this research was mixed with quantitative data from questionnaires, for example. Although there has been some previous work on energy culture from an analytical cluster approach, psychological constructs were not well-developed then, so this is still an opportunity to expand the research. As the energy culture model is a general framework for analyzing energy culture, it can also be applied in other countries and as such be useful for future research for other countries beyond Norway. The discussion and integration of psychology and social practice theory also seems promising for future research, as disciplines seem to share concepts such as habits and social norms, and as such they are not as different as some have argued.

8 References

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Appendix

Appendix A: The newspaper ad (Klößner, 2011)

NTNU – Det skapende universitet

Ved NTNU i Trondheim er den teknologiske kunnskapen i Norge samlet. I tillegg til teknologi og naturvitenskap har vi et rikt fagtilbud i samfunnsvitenskap, humanistiske fag, realfag, medisin, lærerutdanning, arkitektur og kunstfag. Samarbeid på tvers av faggrensene gjør oss i stand til å tenke tanker ingen har tenkt før, og skape løsninger som forandrer hverdagen.

Vi søker deltakere til et gruppeintervju om energibruk



Intervjuene på oppdrag av ENOVA gjennomføres i juni av en forskergruppe fra NTNU og skal omfatte mennesker i forskjellige livssituasjoner. Deltakelsen kompenseres med 1.000 NOK. Er du interessert i å delta på et totimersgruppeintervju om aspekter som påvirker energibruk i norske husholdninger ta kontakt med oss så snart som mulig: christian.kloekner@svt.ntnu.no (tlf 735 91977).

I Tromsøområdet skal det gjennomføres to intervjuer
tirsdag 7. juni i lokalitetene til Universitetet i Tromsø:
KL. 16.00-18.00 for deltakere som har bosted i Tromsø by
KL. 19.30-21.30 for deltakere som bor utenfor Tromsø by



NTNU

Det skapende universitet

Appendix B: Descriptive statistics of the sample (Klöckner, 2011)

	Trondheim	Tromsø	Bergen	Oslo	Total
Participants	17	17	18	18	70
Living in the city	9	9	8	9	35
Living in the surroundings	8	8	10	9	35
female	52.9%	64.7%	44.4%	55.6%	54.3%
Mean age (SD)	35.5 (11.9)	42.9 (13.3)	45.0 (15.3)	47.3 (13.5)	42.7 (13.5)
Number of children (SD)	1,8 (1.5)	1.2 (0.8)	1.6 (1.5)	1.3 (0.9)	1.5 (1.3)
Employed	47.1%	62.5%	61.1%	50.0%	55.1%
Self-employed	5.9%	6.3%	11.1%	11.1%	8.7%
Student	35.3%	12.5%	11.1%	5.6%	15.9%
Pensioners	5.9%	12.5%	16.7%	11.1%	11.6%
Unemployed	5.9%	6.3%	0.0%	16.7%	7.2%
Maternity leave	0.0%	0.0%	0.0%	5.6%	1.4%
Married / partnership	64.7%	47.1%	66.7%	61.1%	60.0%
Apartment	52.9%	52.9%	38.9%	38.9%	45.7%
House	47.1%	47.1%	61.1%	61.1%	54.3%
Renting	29.4%	29.4%	16.7%	22.2%	24.3%
Size of the dwelling (SD)	107.1 (55.6)	112.9 (63.7)	133.2 (75.7)	128.5 (62.1)	119.5 (63.8)
Age of the dwelling (SD)	43.8 (30.1)	29.1 (17.6)	43.4 (33.1)	31.9 (22.7)	37.5 (27.2)

Appendix C: The interview guide

Til intervjuleder:

- *I diskusjonen:*
 - *pass på at enkelte deltakere ikke dominerer diskusjonen*
 - *motiver deltakere å fordype deres synspunkter hvis de bare gir korte svar/bidrag*
 - *Hvis du ikke er klar over hva en deltaker mener, spør.*

Innledning

Til intervjuleder:

- *Introduser deg og funksjonen din i studien*
- *Forklar formålet med studien*
- *Henvis til videoopptak og retten til å trekke seg når som helst (de som kom til intervjuet og trekker seg under selve intervjuet skal få kompensasjon uansett)*
- *Forklar at “energi” i dette intervjuet innebærer ikke bare elektrisitet men alle typer energibærere som er brukt i et hushold (også ved, olje, pellets, ...)*
- *Forklar at energibruk i denne studien tolkes ikke bare som energibruk i huset/leilighet men også som energibruk for mobilitet*

Spørsmål i innledningsdelen:

- 1) *Hvordan ser deres energibruk ut? Hvordan ville dere beskrive deres energibruk? Kan dere beskrive kort på hvilke måter dere bruker energi?*
- 2) *Kjenner dere til deres energibruk (strøm, bensin, osv.)? Vet dere hvordan deres energibruk er fordelt på de forskjellige områdene (f eks oppvarming, vaskemaskin, TV, bil, laging av mat, andre elektronisk utstyr, ...)?*
- 3) *Hvordan påvirker deres livssituasjon (f eks antall familiemedlemmer, boform, jobbsituasjon) energibruket deres?*
- 4) *Generelt sett, hva synes dere er faktorer som påvirker deres energibruk?*

Normer/verdier/norsk “energikultur”

- 1) *Hvis dere ser på verdier og normer knyttet til energibruk i Norge, hvordan ville dere beskrive dem? Hva synes dere er nordmenns forhold til bruk av forskjellige typer energi?*
- 2) *Hvordan ser det ut i nabolaget deres? Finnes det en slags felleskultur med hensikt til energibruk?*
- 3) *Snakker dere med andre om energibruk, energipriser eller lignende? Hva med debatt i aviser e. l.? Hvordan ser dere på andres meninger og holdninger rundt dette temaet?*
- 4) *Hvilken verdi har energi til dere? Er energi verdifull? Er energisparing noe som er forankret i deres verdisystem?*

Energisparing/energieffektivisering

Nå skal vi snakke om energisparing i hverdagen og investeringer i miljøteknologi (f eks sparepærer, varmpumpe, energisparende hvitevarer, osv.).

- 1) Hva er faktorer som påvirker deres evne eller motivasjon til å spare energi eller installere/bruke mer energieffektivt utstyr (f eks sparepærer, varmpumpe, energisparende hvitevarer, osv.)?
- 2) Hva er barrierer mot energisparende adferd? Hva forhindrer at dere forandrer deres adferdsmønstre?
- 3) Hva kunne bidra til at dere forandrer adferden deres?
- 4) Hva er barrierer mot energisparende investeringer?
- 5) Hva kunne bidra til å gjøre energiteknologi mer attraktivt? (Hvis gruppen bare snakker om penger: Tenk også på andre ting enn penger)
- 6) Hvordan synes dere at dere kunne spare mest energi? Synes dere at dette er realistisk?

Påvirkningsfaktorer på energibruk/energieffektivisering (fordypning hvis dem ikke ble omfattende diskutert før)

- 1) Vi har allerede snakket litt om hvilke faktorer som påvirker deres energibruk/ energieffektivisering, nå skal vi gå gjennom en liste av faktorer som har vist seg å være av innflytelse i andre studier. Vi er interessert i hva deres synes om dem. Synes dere, at disse faktorene er viktige for dere også eller ikke?
 - a. Strukturelle faktorer slik som klima, størrelse på huset/leilighet, antall familiemedlemmer, antall barn, jobbsituasjon. Har det vært forandringer i enkelte av disse faktorene som førte til økt eller minsket forbruk?
 - b. Inntekt
 - c. Bevissthet på energiproblematikken
 - d. Holdning til energisparing/energieffektivisering
 - e. Verdier
 - f. Vaner/rutiner
 - g. Tro på effektiviteten av energisparingsadferd
 - h. Tro på egen evne å spare energi
 - i. Sosial innflytelse (det som du tror andre forventer av deg)
 - j. Det som andre gjør
 - k. Pris på energi
 - l. Hvordan energi blir produsert (f eks vannkraft/vindenergi vs. kull eller atom)
- 2) Hvor mye kontroll synes dere at dere har over eget energibruk? Hva er faktorer som tar kontrollen fra dere?

Appendix D: Initial table of energy culture characteristics results

Theme	Code	Number of mentions	
		Groups	Persons
CONSUMER SOCIETY	Buy and throw away stuff	8	16
	Have a lot of gadgets	6	19
	Big houses	5	8
	Buy new stuff after 2-3 years	2	9
ILLUMINATION	Illumination	8	36
	Other countries are better at turning off lights	8	21
	Mismatch between injunctive and descriptive norms of public lighting	5	9
INDOOR HEATING & TEMPERATURE	Wood heating	8	25
	Norwegians like it warm and snug	7	15
	High indoor temperature	7	15
	Floor heating (is cozy)	4	11
	High indoor temperature due to toddlers on the floor	4	6
	T-shirt weather inside	2	2
SHOWERING & WATER USE	Norwegians waste water	6	12
	Teenagers shower a lot and waste a lot of water	6	11
	"I shower a long time"	5	11
	We have unlimited amounts of water	4	6
	"I bathe"	1	1
RECYCLING	Demotivated due to stories of recycled material thrown into same bin of the recycle car	5	12
	Should have more focus on not using plastic bags	2	3
	Norway good at recycling big e-waste	1	1
MONEY BEFORE ENVIRONMENT & SELF-CENTEREDNESS	Focus on economy first, sees environment as 2nd benefit	8	24
	Norwegians are self-centered hedonistic	6	10
NATURE & REFERENCES TO TRADITIONAL LIFESTYLE	Childhood memories	6	15
	Cabin	4	10
	References to a simple or traditional lifestyle	4	8
	Energy and nature defines Norway	4	5

	Do not want nuclear/coal production in Norway	3	5
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TRANSPORT	Car Culture	8	17
	Norwegians travel a lot by plane	6	10
	Public transportation is really bad	4	6
	Cycling	1	3
	Excessive car use	1	3
	Youth has bigger need of mobility than others	1	1

ELECTRICITY, PRICES, RESOURCES	Historically cheap electricity prices (no need to save)	8	13
	Electricity and safety concerns	7	16
	Take electricity for granted	7	11
	Higher electricity prices and other taxes can be paid	7	9
	Green/renewable electricity	7	9
	Common to use a lot more electricity/water when renting	5	10
	Electricity is expensive	5	7
	Unlimited amounts of water	4	6
	Energy and nature defines Norway	4	5
	Complains a lot, but no action	3	6
	Norwegians are spoiled with water and resources	3	5
	What's the point in saving electricity/water when they just sell it abroad/make the government richer?	3	5
	Do not want nuclear/coal production in Norway	3	5
	Panic when electricity is gone	2	4

CULTURAL DIFFERENCES	Awareness through travelling to other countries	8	20
	Visiting other countries	8	20
	Other countries are better at using less electricity/water	7	21
	Visitors from other countries	5	8

SELFISH NORWAY	I don't care, I use what I want	5	5
	"Norway contributes little to the world pollution. We are only 5 mil. people..."	4	6
	Norwegians are blunt when it comes to environment	4	5

SOCIAL NORMS	References of social pressure, media, children, neighbours (To do or not do something)	8	30
	Children influence parents/adults positively	4	5

	People should mind their own business. Electricity use etc is a private matter	3	8
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OTHER	Habits	8	20
	Comfort	7	25
	Cozy	6	15
	It's about prioritizing, maybe I can shower more because I dont have a car	5	6