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Supervisor:
Pernille Gooch

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Altering the Modes of Consumption
Nudge Policy in the Context of Hegemonic and Counter-
Hegemonic Environmental Discourse

by

Mara Bauer

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Abstract

One particular approach of behavioral economics has gained attention within environmental politics during the last decade. The idea of *nudging* (“gently pushing”) people in situations of decision-making towards the choice that in the long run is best for them as well as for the society and/or the environment seems to attract policy makers around the world. Many governments inside and outside the EU have made advances to research on the impacts of nudging and to implement nudges in order to improve the people’s and hence society’s well-being. In this thesis, the current application of nudging is scrutinized by taking a close look on the political nudge practices from a human ecological perspective. This entails a critical approach of the discourse of ecological modernization and instead the favoritism of a discourse that pursues more radical changes to the cultural assumptions of Western societies that are responsible for excessive consumption modes. A selection of exemplary studies and reports on the implementation of nudges that claim to promote sustainable consumption gives insights into the workings of ten particular types of nudges that are assessed against the background of the mentioned discourses as well as regarding their inherent power structures. By the means of these insights, the dominating presence of ecological modernization theory within the applied nudges is revealed. However, there can also be a certain potential within nudging to initiate consumption practices that are more consonant with the human ecological perspective identified.

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1 Introduction

This introductory chapter of my thesis shall serve as an entry as well as an overview to the reader. It consists of an explanation of the situational context of my research, the listing of four guiding research questions and the outlining of the thesis structure.

1.1 Point of Departure

We live in the age of the consumer society, Bauman (2005: 23) claims. Its decisive feature is not that suddenly everyone consumes, but that the societal focus has shifted towards perceiving the main purpose of the members of society in their role as consumers (ibid: 24). People who are not capable of indulging in the evoked cult of consumption are suppressed towards the margins of society (ibid: 37). Consumption has become the source of identity, which does by far not imply a stable condition once created. Identity rather needs to remain a flexible concept, constantly altered by new consumption choices (ibid: 27-28). Choices are the motor of consumption as Bauman (2005: 26) observes. Moreover, he indicates the infinite character of current consumption patterns as they are not designed to ever reach lasting satisfaction (nor are the products designed to last). Instead, he postulates, “desire desires desire” (ibid: 25). However, the consumer society’s spirit does not stop at shaping societal structures, it determines the society’s impact on the state of the natural global environment which was found to be in a crisis. Environmental politics have recognized this relationship and started to address it in various different ways.

One particular approach of behavioral economics has gained attention within environmental politics during the last decade. The idea of *nudging* (“gently pushing”) people in situations of decision-making towards the choice that in the long run is best for them as well as for the society and/or the environment seems to attract policy makers around the world. Many governments inside and outside the EU have made advances to research on the impacts of nudging and to implement nudges in order to improve the people’s and hence society’s well-being. While the UK has established the Behavioural Insights Team (www.behaviouralinsights.co.uk) also referred to as Nudge Unit, Germany has commissioned a research institute with the development of adequate nudges to enhance sustainable consumption (ConPolicy 2015), and the governments of Denmark and Norway are consulted by independent organizations that are specialized on identifying nudges for different purposes (Mont et al. 2014: 37-38).

In the light of the Sustainable Development Goals (SDG) formulated and released by the United Nations in September 2015 and taking effect on January 1, 2016 nudging might

gain even more popularity. The SDGs draw a vision of the world and its population in the year 2030 that is represented by 193 member states (United Nations 2015). The list of the 17 goals subdivided into 169 targets is long, comprehensive and certainly ambitious. Sustainable development has received new attention and governments have developed sustainability strategies for their countries' internal and external sustainability performance, which are likely to address sustainable consumption. Nudging appears to be a welcomed measure in this context. However, whether strategies under the framework of sustainable development are actually far-reaching enough and capable of reducing the impacts of consumer society on the natural environment is questionable. This is mainly due to their compliance with the paradigm of economic growth that is interdependently connected with consumer society. *Ecological modernization* seems to be the magic phrase that is supposed to make everything happen – and everyone happy.

I intend to scrutinize the way nudging is currently being applied by taking a close look on the nudge practices from a human ecological perspective that critically approaches ecological modernization and instead demands more radical changes to the cultural assumptions of Western societies that are responsible for excessive consumption modes as illustrated above. It is particularly those nudges that claim to pursue more sustainable consumption which are of special interest in regard of this thesis. A selection of exemplary studies and reports on the implementation of sustainability nudges will give insights into the workings of the ten types of nudges as defined by the forefathers of nudging, Cass R. Sunstein and Richard H. Thaler. By the means of these insights, I intend to assess first of all the coherence of nudging with ecological modernization, but also its potential to initiate consumption practices that are more consonant with the human ecological perspective.

1.2 Research Questions

The following research questions will guide the proceedings of my thesis. The first three questions can be seen as a set of essential sub-questions which in combination are supposed to induce the answer to the fourth and main question.

- Is nudging applied in order to promote ecological modernization, and if so, how?
- Which opportunities does nudging offer to the counter-discourse and how can they be expanded?
- What kind of power relations can be identified in the portrayed nudge implementation?

- To what extent can nudging be considered a useful tool in human ecological terms?

1.3 Thesis Structure

In order to approach the research questions above, several steps need to be taken. Essential to this thesis are the conceptions of two different political discourses within environmental politics that will form the theoretical framework of the conducted analysis: the discourse of ecological modernization and a discourse of alternatives. But first of all, I introduce the theory and ideas behind nudging. Following this, chapter 3 will first outline ontological and epistemological assumptions that underlie the analytical approach of this thesis before describing the applied method which is oriented towards qualitative content analysis. Chapter 3.2 identifies a way to approach nudging within the framework of political ecology and introduce Hajer's theory of the hegemonic character of the discourse of ecological modernization and an identified alternative discourse that I derive from the criticized deficiencies of ecological modernization in the light of consumption. Based on this, I will develop categories for the following qualitative content analysis. By means of its ten different mechanisms and a selection of twenty exemplary studies, nudging will be inquired in chapter 4 in terms of its coherence with the two opposing discourses. Chapter 5 contains the discussion of the most striking aspects of the analysis in the context of policy implementation. If possible, suggestions will be made for the concrete implementation of such nudges. The concluding remarks in chapter 6 intend to find a position towards the question to what extent nudging can be seen as a useful tool apart from the discourse of ecological modernization and in line with the human ecology understanding underlying this thesis.

2 Introducing Nudge Theory

In 2003, Richard H. Thaler, economist, and Cass R. Sunstein, legal scholar, published an article introducing the concept of *libertarian paternalism* stating that there is by far no oxymoron to be found in the connection of those two words (Thaler and Sunstein 2003: 175). What they are suggesting is “an approach that preserves freedom of choice but that authorizes both private and public institutions to steer people in directions that will promote their welfare” (ibid: 179). The libertarian part of the idea consists of the freedom of choice which entails that people who are, for instance, suggested to make a healthy choice of food by the system that is offering the food, still have the option to choose an unhealthy alternative without much or any extra effort (ibid: 175). According to Thaler

and Sunstein, the influence the system is exerting is justified in the unavoidability of the system to promote one offer over the other, and in the presence of easily accessible alternatives. As a result of successfully pointing people towards healthier food as in the mentioned example, the choice makers are better off in the long-term and so is their government that is spared health services.

Five years after the publication of this article, Thaler and Sunstein have developed the concept of libertarian paternalism further and have equipped it with a more convenient term: Nudging. In their book “Nudge – Improving Decisions about Health, Wealth and Happiness” they describe how governments, companies and anyone who wants to steer people in certain directions for their own good can use nudges to do so. Thereby, the ones in power to use nudges are called *choice architects*: people or institutions who have “the responsibility for organizing the context in which people make decisions” (Thaler and Sunstein 2008: 3). A nudge is defined as “any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid” (ibid: 6). An underlying assumption of nudges is that people usually do not choose rationally as the idea of *homo oeconomicus* would suggest, but are biased and influenced by many different kinds of aspects. Instead of calculating the wins and losses a decision might imply with the most objective overview as possible, one might just stick to her gut feeling (ibid). This describes as well why nudges work as it reveals why they are needed in order to help the *choice makers* to make a decision that they do not regret later since it improves their well-being. “Some nudges work because they inform people; other nudges work because they make certain choices easier; still other nudges work because of the power of inertia and procrastination” (Sunstein 2015: 208).

But what do nudges actually consist of? Thaler and Sunstein (2008) give many examples of nudges. A popular one is the setting of default rules in the context of organ donation. While in Austria the default setting is that everyone is a donor unless they opt-out and choose not to be, Germany needs people to opt-in and purposely become a donor. Unsurprisingly, 99% of Austrians are organ donors and less than 10% Germans are (Reisch and Oehler 2009: 36). This illustrates how nudges in the sense of a given choice architecture are often, if not always, present in decision-making anyway and how governments can make use of them.

Nudging got soon also appreciated by choice architects – policy makers, corporations, public administrations – who intend to promote sustainable consumption and behavior in terms of recycling, purchasing more organic products, using less energy and further more. While in theory these notions are very popular, “attitudes towards ethical consumption oftentimes do not translate into ethical consumer behavior, and this is often explained by an attitude–behavior gap” (Lades 2014: 122). Nudges aim at reducing this gap by supporting the consumer in the moment of decision to make the choice that corresponds to the intention of acting sustainably instead of being overwhelmed by impulsiveness (ibid: 123). Nudges might in the end lead to impulsive sustainable consumption since “the characteristics of the nudge approach have the potential of making sustainable behaviors much more attractive, effortless and rapid” (Goepel et al. 2015: 11). How sustainability nudges are being applied in specific will be revealed in chapter 4 as part of the analysis which will also take Sunstein’s distinction between ten different types of nudges into account. But first of all, a proper scientific framework is required in order to purposefully approach the analysis.

3 Setting the Frame

This chapter creates the scientific basis of the thesis. It is divided into methodology and theoretical framework, the latter of which represents the backbone of this thesis. After embedding the topic into the context of political ecology, the discourse of ecological modernization and an identified counter-discourse are each introduced within their individual contexts of theories.

3.1 Methodology

This section is dedicated to the ontological and epistemological approaches to my research. First, a short outline of how my research interest was forged is conveyed. Section 3.1.2 is supposed to give an impression of my standpoint entering the field of consumer policy and sustainability as a human ecologist. It is supposed to highlight the task this thesis is assigned to as well as its approach towards sustainability. In the following three subsections I describe the method, data collection and the limits of the analysis respectively. All of those sections as well as the remainder of this thesis underlie the ontological approach of “realist social constructionism” as presented by Elder-Vass (2012). In the combination of critical realism and a moderate social constructionism that acknowledges the existence of material and social reality, a fruitful way of understanding can be found (ibid: 7). While “social construction is a real and causally significant process” (ibid: 265), it is one “in which the actors are material human

beings with a capacity for agency that arises from their physical nature” (ibid: 203). The realist approach to social constructionism therefore allows to analyze the way in which social construction takes place while taking into account that this process not only depends on social, but also on “material configurations” (ibid: 261) which in regard of this thesis would *inter alia* consist of the condition of the natural environment.

3.1.1 Origin of Research Interest

There are two main aspects that have led me to the topic of this thesis: one is stemming from personal self-observations and one from a scientific interest, although the two certainly intertwine. My self-observations reach back some years to the day when I received my first pocket money at the age of about six. I will not pretend that I remember what I bought from that money (it was most likely some sort of candy), but I do know that ever since that day a major part of my brain capacity has been occupied with purchase decisions. As a teenager I considered shopping as a hobby and spent several days a month in the city center only to buy what I would lose interest in after a few months or even weeks. It was not until I started studying environmental sciences (apparently I had developed some kind of environmental consciousness after all that led to this decision) when I first questioned my shopping behavior and a process of rethinking desires and needs was set into motion. I might not be the fastest learner in this regard, but realizing how long it still takes me, who is constantly confronted with the consequences of mass production and consumption in her studies, to overcome certain consumption patterns and establish new behaviors, makes me wonder how we, as a society of slow learners, are ever going to make change happen. Maybe it is some constant gentle pushes that can get us there?

The specific scientific interest I mentioned was formed during an internship at ConPolicy, the Institute for Consumer Policy in Berlin which I completed from October 2015 to January 2016. One of the main projects I became acquainted with was called “Gentle Nudges Towards Sustainable Consumption” and was commissioned by the German Federal Environment Agency. The aim was to design adequate nudges that promote sustainable consumption and can be implemented by the German government. During the process of working on the project I kept on considering the pros and cons of the controversial approach and asked myself how I could approach this matter from my current position as a human ecology student. This is basically how the thesis at hand was initiated.

3.1.2 The Human Ecological Standpoint and Sustainability

In the attempt of defining human ecology one might first of all come to the conclusion that there are several disciplines claiming to be responsible for its emergence as well as contributing to its current contents. Geographers, biologists, sociologist, psychologist, anthropologists, architects and many more deal with the interrelatedness of humans and ecology as Young (1974) illustrates. They all take different perspectives and sometimes even build on different normative constructs.

The conception of human ecology on which this thesis is mainly based is oriented towards the ideas of Dieter Steiner, geographer and former human ecology scholar at ETH Zurich. According to him, approaching the world from a human ecology perspective should especially include the courage to question the status quo and think of ways to improve it (Steiner 2003: 58). Currently the status quo is being reigned by its subsystems science, technology and economy and their respective logics. “Today our task would thus seem to be to challenge the dogmatic aspects associated with these logics and to sever the bonds established by them. A general human ecology should help this process by being a critical power, critical of previous beliefs, such as that science invariably leads to truth, that technology solves any practical problems, and that economic growth furthers the well-being of humans at all times” (Nauser and Steiner 1993: n.p.). Alf Hornborg, professor for human ecology at Lund University, and Paul Trawick, anthropologist at Idaho State University, complement this approach with their claim for the adoption of a worldview that acknowledges that “there *are* limits to the extent and the spread of material affluence” (Trawick and Hornborg 2015: 2, italics in original) and that an enhancement of virtual wealth at one place, ultimately means a decline of real wealth at another place (ibid). They hence support the “image of limited goods” as an essential understanding when approaching sustainability issues (ibid: 8).

Some human ecologists might assign themselves in regard to this cause to the concept of sustainable development as most famously postulated by the Brundtland Report (see i.e. Steiner 2008). Steiner, however, would intervene and question the concept itself and especially the coverage of the conventional understanding of sustainability within it. In Steiner’s opinion, human ecology needs to go further in its objective than following the mainstream definition of the three pillar model of sustainability according to which sustainability can be reached through economic, social and ecological compatibility and which is mostly applied by practitioners in the discussion on sustainable development (Steiner 2003: 58). In his cause of complementing the sustainability concept in a way that is coherent with his conception of a human ecology perspective, Steiner (2003)

firstly points out the shortcomings of the three pillar model before suggesting corresponding supplements. One of his three main points of critique is that the model is missing a fourth pillar that stands for the cultural aspects of development and serves as an ethical guard rail (ibid: 60). He argues that without taking into account the persisting cultural values, we cannot know where we are heading, for a change of those values is crucial for establishing truly sustainable lifestyles that are not only based on efficiency but especially on sufficiency (ibid).

Secondly, Steiner (2003: 60) doubts that the current political system of the Western democracies can meet the challenges of implementing sustainable development. Despite their ideal of equally acknowledging many different interests while setting the political path, experience has shown that some interests always seem to weigh heavier than others, be it through strategic actions by politicians or lobbying by strong economic associations. Also, the path of sustainability can only be planned and reached in a long term perspective, longer than the common legislative periods. Additionally, governments on the one hand usually depend on the tax revenue from the corporate world which – on the other hand – needs to be regulated in order to prevent further ecological and social damage. All these doubts do not leave much space for the possibility of a truly sustainable development. Therefore, Steiner supports the idea of an independent future council that is equipped with the power of veto and established in addition to the common governmental structures (ibid: 60).

Thirdly, Steiner (2003: 61) claims that the postulated equilibrium of the three, respectively four, pillars could only deliver the expected results of strong sustainability if the power of interest was distributed equally between the pillars. Since this is not the case, ecology must receive a primary position in order for it to become the starting point of all economic, social and cultural action and thinking. In the end it is the ecological sphere that secures our livelihood (Steiner 2003: 64). Despite attempts like this to complement the concept of sustainability, the notion has remained that sustainability is neither based on an accurate definition nor on measurable precision (Glaeser 2003: 40). But since this might never have been its intention and due to its apparent inevitability, it will be treated in this thesis broadly as a rather open norm that describes practices striving for a condition in which the ecological crisis has been overcome while acknowledging that the ideas how this condition can or should be reached differ enormously. The human ecological task then is to keep a critical eye on all those ideas and not to shy away from fundamentally challenging the given structures. However, what remains unmentioned by Steiner is the part the term *development* plays in the

concept of sustainable development which is being criticized intensely by others. Banerjee (2003: 150) for instance argues that development can be understood as synonymously to economic growth and that sustainable development consequently means to sustain economic growth (ibid: 153). Since even the rather weak three pillar model of sustainability does - in theory - not allow this exceptional focus on the economic pillar, the whole concept appears to contradict itself. Therefore a clear distinction between sustainability and sustainable development should be made.

Sustainability research in the social sciences faces several challenges as Fahy and Rau (2013) illustrate. If the aim is to particularly produce policy-relevant research „[t]he need to appeal to policy makers, practitioners, public and scientific audiences can create tensions over terminology used, visual representations of results, or the choice of media used to publicise data” (Fahy and Rau 2013: 177). The terminological issue in sustainability research starts with the term sustainability which is interpreted quite differently among sustainability scholars (ibid: 18). This implies that the distinctions of what falls into the category of sustainability practices and what does not most likely differ as well. From some viewpoints a certain nudge might seem to encourage sustainability practices, whereas other viewpoints apply a more critical approach and therefore a more narrow definition of sustainability. Section 3.2 sheds light on two different understandings of sustainability practices after locating nudging and its underlying power structures in its political ecological context. The whole section serves the purpose of the theoretical basis to the analysis that I apply in chapter 4 which is modelled after the method of qualitative content analysis as presented in the following section.

3.1.3 Method

Qualitative content analysis has its roots in quantitative content analysis, however it should not be understood as an alternative to it but as an extension that allows systematic and interpretative analyses of texts (Mayring 2010: 48). As the envisaged analysis of this thesis intends to filter very particular aspects from a rather big selection of twenty case studies, a systematic approach seems to be useful. At the same time qualitative content analysis allows the researcher to create an individual and open but comprehensible system of categories which is imperatively drawn from a theoretical framework and represents the center of the analysis (ibid: 49-50). Since it was originally designed to analyze especially communicative texts, a few modifications in its application will be necessary for this context. Nevertheless, due to its focus on structuring rules and theory, qualitative content analysis appears as an appropriate tool.

Mayring (2010: 69) describes three different approaches of analysis: summary, explication and structuring. In this thesis, structuring, meaning the textual organization by the means of a deductively generated system of categories (ibid: 92), will be applied. Its steps adapted for this particular analysis are shown in figure 1 and they are applied in different phases throughout the thesis as noted in the figure.

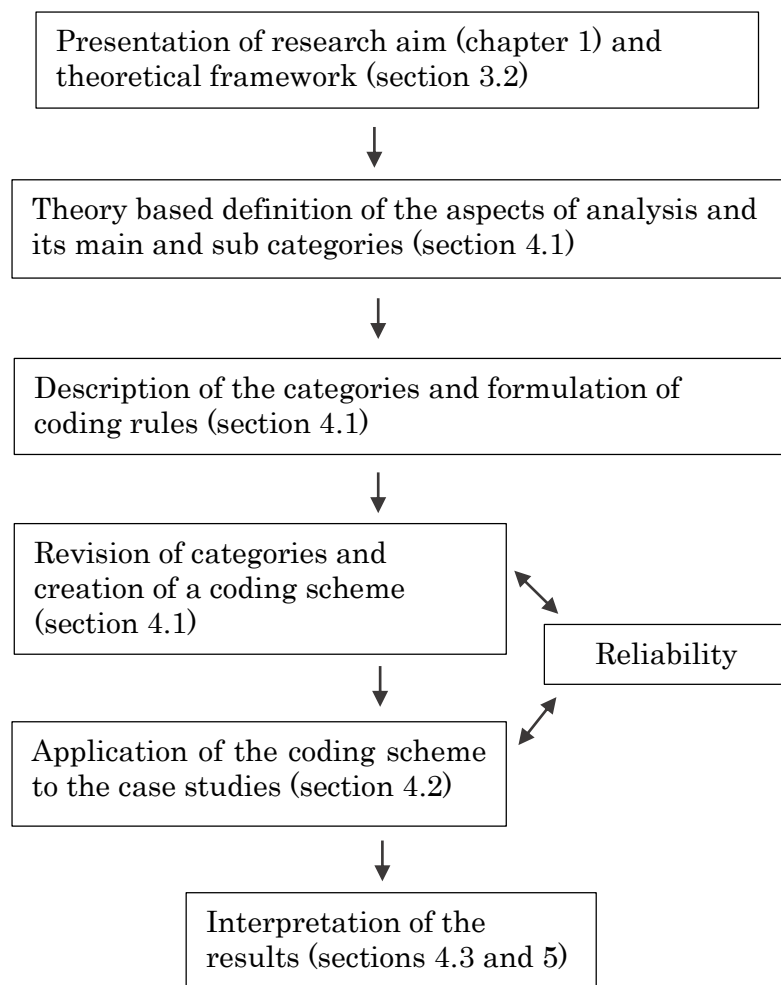


Figure 1: Steps of the structuring qualitative content analysis adapted from Mayring 2010 and Mayring 2000 and embedded into the context of this thesis

3.1.4 Data Collection / Material Selection

The research does not contain actual field work but is supported by a selection of studies and theoretical concepts which in combination form the analytical basis. Twenty studies will be taken under scrutiny in chapter 4, retrieved from a database of more than 300 studies provided by ConPolicy. The selection of these Top 20 studies is based on the selection process ConPolicy has applied in their search for suitable scientifically and/or

practically explored nudges to base their suggestions to the German Federal Environment Agency on. Therefore, the criteria contained applicability of the nudge in Germany, effectiveness, importance of the objective, reliability of the study's sample and, to some extent, innovativeness. The most suitable ones in regards to the criteria were identified in a five-step-process through which the extensive database could be narrowed down to twenty and later to ten and then finally five nudges. Analyzing ConPolicy's Top 20 in respect of the research interest of this thesis is justified in its scientifically approved standards, its direct policy relevance for the German government, hence its representativeness for the current character of environmental politics, and its manageable scope which lies within the capacity of this thesis.

3.1.5 Limitations

The analysis is limited to a selection that has been deemed relevant in and for Germany which might not be the same for any other Western country, but is still assumed to reflect the mainstream interest that has been taken in nudging as a policy tool by Western governments. Moreover, it will not be of much concern whether or not nudging is actually effective and reasonable in its approaches (as this is not a behavioral economics paper) and whether it can be considered ethical which is intensely debated by scientists, politicians and practitioners in the field and would open up a complex discussion beyond the scope of this thesis. Furthermore, the ten types of nudges that will be introduced later are not equally represented by the selection of studies, so their assessment will only be possible to different extents. The limited amount of studies does not allow generalizations either.

3.2 Theoretical Framework

This section introduces three theoretical approaches creating a scientific framework which provides the analysis with a human ecological standpoint. Associating the topic with the broad concept of political ecology seems reasonable and maybe even indispensable, nevertheless the context will only be displayed in very limited terms due to the paper's focus on the other frameworks drawn afterwards.

3.2.1 The Context of Political Ecology

Many authors, like Greenberg and Park (1994: 1) and Robbins (2004: 54) refer to Marx's concept of political economy as the origin of political ecology. Issues of political economy become political ecology issues when the role of the non-human is added to the explorations (Greenberg and Park 1994:1). Or put another way, political ecology is "an approach that combines the concerns of ecology and political economy to represent an

ever-changing dynamic tension between ecological and human change, and between diverse groups within society at scales from the local individual to the Earth as a whole” (Peterson 2000: 324).

Further explanations claim that political ecology is not one single theoretical framework, but rather a broad field of science that includes various currents with joint principles. All of which seek to understand the relations between the physical ecology of the natural environment and the actions and interests of human individuals and societies “with the explicit consideration of the relations of power” (Robbins 2004: 12). There are also common basic assumptions throughout the different currents of political ecology that can be identified. Among these are the centralization of social relations, the acknowledgement of different perceptions of reality, the significance of global influences on local structures and the examination of the combined interdependencies between the relevant drivers of social/political or ecological change (Robbins 2004: 5; Hafner 2014: 21-22).

“[W]hile politics cannot ignore ecology, ecological approaches need to consider political dynamics in their explanations of human actions” (Peterson 2000: 324). And a major sphere of human actions can certainly be found in the role of humans as consumers whose evident ecological impact cannot be denied. This very sphere, however, has come to expand from the limitations of private consumption to the circumstances of public citizenship (Trentmann 2007: 147). In the concept of the ‘citizen-consumer’, consumer culture is recombined with political action and agency, initiated by the arising questions of social and environmental justice (ibid: 149). Spaargaren and Mol (2008: 354) even argue that a separation of the two roles is no longer realistic in a globalized context and that they inevitably merge. If this is the case, what happens to the citizen-consumer’s agency if the supposedly political consumption choices are at the same time based on the choice architecture that was explicitly designed by policy-makers in order to provoke these very choices? The proponents of libertarian paternalism argue that it does not deprive consumers of their freedom of choice – what it might be depriving yet is the citizen-consumers’ political power. Maybe this is only an issue as long as choice architect and citizen-consumer diverge in their attitudes; maybe this power is not even existent in the age of consumer society, as Bauman (2005) claims. He argues that the alleged freedom of choice suggests the consumer a position of power exercised in every decision that places one product or service over the other (ibid: 30) without the consumer recognizing that this very freedom has been taken from him or her at the entrance of the market place (ibid: 26).

In the face of these rather shattering realizations it should be considered that Spaargaren's and Mol's assumption is not encompassing because in the end "citizenship is larger than consumption" (Trentmann 2007: 254) and citizens are capable of using other, stronger ways to express their opinions than only through consumption. For instance, the focus could be shifted from "the power of consumer choice in making the 'right' decision" (Barr and Prillwitz 2013: 39) towards questioning the need to consume in the first place.

These questions shall be kept in mind during the following process in order to address the third research question on the underlying power structures of nudging. What is hence of concern in terms of the political ecology of consumption, is mainly directed towards the choice makers and the empowerments and restrictions they are subjected to. In this sense, as is usually implied in the portraying of political ecology issues, it is assumed "that there are better, less coercive, less exploitative and more sustainable ways of doing things" (Robbins 2004: 20). However, as already indicated, the main pursuit of this thesis lies in identifying the now following concepts within nudge policy.

3.2.2 The Discourse of Ecological Modernization

An important theoretical framework for this thesis is taken from Hajer (1997) and his book *The Politics of Environmental Discourse* in which he analyzes the discourses around a certain environmental problem in two different countries by drawing on Foucault as well as Billig and Harré and their conceptions of discourse analysis. Even though neither discourse analysis itself, nor a specific environmental problem is at the interest of this thesis, the concept of discourses and especially of the discourse of ecological modernization depicted by Hajer will be highly relevant in the succeeding chapters.

Hajer defines discourse "as a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer 1997: 44). It serves as a window to the power structures of society (ibid: 55) and sheds light on institutional functions and processes (ibid: 264) while at the same time "institutional arrangements are seen as the pre-conditions of the process of discourse-formation" (ibid: 60). Its acknowledgement can hence be of special use for an investigation of political contexts such as policy-making and social change, whereas policy-making in general is approached here from the social constructionist view. This is understood as "an interpretive activity in which different, and often contradictory claims as to what is the

case are to be judged, compared, combined, and acted upon” (ibid: 21-22). As Hajer (1997: 59) argues, not only problem perceptions, but also political interests are produced by discourse. Discourse is therefore established and constantly being re-established from the inside by its actors’ socio-cognitive acceptance of the discursive practices (ibid: 60) and becomes hegemonic once it gets institutionalized through according policies and institutional arrangements (ibid: 61).

Two important concepts are connected to discourses and help to identify them and the functions of their internal practices: story-lines and discourse-coalitions. “Story-lines are narratives on social reality through which elements from many different domains are combined and that provide actors with a set of symbolic references that suggest a common understanding.” (ibid: 62) In other words, story-lines wrap up complex relations in powerful punchlines to gather actors of different fields around this particular emblem. In order to do so, they make use of refined linguistic styles and figurative language such as metaphors (ibid: 63). Story-lines are commonly initiated by actors like scientists, activists or journalists (ibid: 66). Through story-lines problems are constructed and at the same time reduced to simpler versions many actors can agree on (ibid) which consequently might reduce the scope or impact of the pursued solution to the initial problem. On the other hand, story-lines can promote originally unpopular issues and give them a new meaning and understanding which empowers their relevance (ibid: 64). In this regard they represent “the prime vehicles of change” (ibid: 63).

Story-lines build also an important part of what Hajer calls discourse-coalitions. The latter tend to emerge around certain story-lines as a group of independent actors performing discursive practices according to their individual understandings of the common story-lines (ibid: 65). The actors in a discourse-coalition do not necessarily know (of) each other or even share the same interest in the discourse. Nevertheless, they all contribute in their own way to the maintenance of the story-lines (ibid: 13). This and the emphasis they put on the origins of story-lines and other discursive practices as indicators for new political tendencies distinguish discourse-coalitions from traditional political coalitions (ibid: 66).

As this thesis can be located within the environmental discourse, it is now of special interest to look into the particularities of this very domain which has developed in the face of what has come to be referred to as the ecological crisis. The way Western societies generally agree to respond to the ecological crisis is through environmental policy-making of different kinds (ibid: 2-3). One particularity to the field of environmental

politics that Hajer (1997: 45) identifies is its “extraordinary discursive complexity” without any claim to coherence. That is why he calls the fact that the actors within the field are still able to understand each other “[t]he communicative miracle of environmental politics” (ibid: 46). An explanation to this miracle can be found in story-lines that can serve as a strategy to overcome this kind of fragmentation in a discourse (ibid: 62) and therefore enable communication. Hajer argues that environmental politics are substantially shaped by the forthcomings of 1972 and 1987 respectively: the report to the Club of Rome *Limits to Growth* and the Brundtland Report *Our common Future*. The former marks the point of departure that introduced the “environmental problematique” to the general policy discourse (ibid: 24) whereas the latter brought about the story-line that soon established the first global environmental discourse-coalition and still unites the *hegemonic discourse* in environmental politics: sustainable development (ibid: 14; see also Brand 2010: 137).

The concept of hegemony referred to by Hajer can most prominently be traced back to Antonio Gramsci and his Prison Notebooks. From his work it can be understood that “hegemony is a particular practice of consolidating social forces and condensing them into political power on a mass basis” (Thomas 2009: 194). Its formation, however, is not produced through coercion but through consent which is found among civil society (ibid: 160) and is inevitably influencing political society (ibid: 194). Civil hegemony has to become political hegemony eventually otherwise it will be decomposed. This is why hegemony is “always-already, even if only implicitly, political” (ibid).

It is therefore of special interest to identify the practices and ideas that comprise the hegemonic discourse whose main story-line is that of sustainable development. According to Hajer (1997: 26) and supported by a more recent statement from Brand (2010: 138), the univocal call for sustainable development by the UN and its Member States has first and foremost put forward a strategy of ecological modernization. As one of the first to use the term ecological modernization in 1982, Jänicke (2000: 2) defines it as a change to the direction of technical progress towards environmentally friendly processes and products. This approach has evolved into a discourse that Hajer (1997: 25) critically defines as one “that recognizes the structural character of the environmental problematique but none the less assumes that existing political, economic, and social institutions can internalize the care for the environment”. Solutions to the ecological crisis suggested within the discourse of ecological modernization are based on “the idea that pollution prevention pays” (ibid) and do not touch upon systemic changes. There are six categories of eco-modernist solution approaches listed by Hajer (1997: 26-29):

- legislation for the internalization of external (environmental) costs
- limits to the emission of certain polluting substances
- introduction of technologies that reduce waste and enhance efficiency
- strategies for the conservation and management of scarce resources
- legislative change that shifts the burden of proof to the polluter
- participation of new actors like NGOs in the political and economic processes

Berger et al. (2001: 58-59) also integrate the introduction of ecological modernization as a belief system into its important features. As a consequence consumption of greener and cleaner products is enforced by a successful implementation of ecological modernization. These approaches fit perfectly into existing system structures and suggest a comparatively easy way out of the crisis (Jänicke 2000: 3). Governments are much likely to be in favor of ecological modernization policy as it delivers convincing economic arguments to the corporate world for aligning with it and at the same time creates the notion that measures against the ecological crisis are being taken and therefore might help to soothe environmentalists' demands (Hajer 1997: 31-34). Foster (2012: 218) demonstrates forcefully many aspects that highlight the predomination of ecological modernization theory in the environmental discourse – from keyword searches in scientific databases to the awarding of scientific honor.

In the third chapter of his book Hajer outlines the path that made ecological modernization become the hegemonic discourse of environmental politics. Essential to this path was on the one hand the report *Limits to Growth* which contains the conceptional roots of ecological modernization (ibid: 84). On the other hand were the struggles of the environmental movement of the 1960s and 1970s which, despite its initially radically opposing arguments and claims and through the interplay of several other events and institutions, eventually moderated its voice and gave way to the rise of the new hegemony (ibid: 100).

Hajer is certainly not alone in his critical approach towards the discourse of ecological modernization. Scholars like Giddens (2000: 54-65) and Jänicke (2000; 2008) seriously question the beneficial impact of ecological modernization on the environment, York and Rosa (2003) illustrate key challenges ecological modernization has to overcome, and Pepper (1998) depicts an alternative model to address the ecological crisis. Their critique might be of different degrees, but they all point towards the necessity of a more deeply rooted change, structurally as well as culturally. In this concern, Mol and Spaargaren (2000: 20) point out the different notions of ecological modernization one can have. They

integrate the cultural aspects into their understanding of ecological modernization that leads to a "reflexive modernity" which could appear to weaken some of the criticism of the above mentioned. However, Foster (2012: 221) argues that "[t]he idea [of reflexive modernity] is that modernization is not a simple, unilinear logic but one that can bend somewhat, picking up new elements, internalizing its own externalities. In the end, though, this amounts merely to the notion that capitalism can learn how to develop technological and market fixes to environmental problems, without altering the nature of social relations." Jänicke's (2000: 3-4) response to Mol's and Spaargaren's reflexive modernity is to insist on the importance of distinguishing between the two notions as the techno-economic approach is not reconcilable with an ecological structural change that he claims crucial. While Hajer in his analysis that identifies ecological modernization as the hegemonic discourse clearly refers to it in the techno-economic sense, he also introduces at one point the possibility of a reflexive variant of ecological modernization which would include cultural processes into the objects of change and thus be more preferable (Hajer 1997: 37). The next section provides some ideas about the quality of such cultural changes.

3.2.3 The Discourse of Alternatives

If ecological modernization is the hegemonic discourse in environmental politics, then what other discourses are there? The previous section already gives some hints on what they might contain as it refers to opposing views to ecological modernization. Since it would be a very broad approach to summarize all the discursive practices that oppose ecological modernization in one single discourse, this section attempts to give insights into the discourse of what should be addressed alternatively or complementary to ecological modernization and is in line with the human ecological perspective. When I refer to *the* counter-discourse during the analysis, however, I specifically address the ideas – story-lines – that are outlined in this section acknowledging that it is not encompassing. The special interest focuses on the role human behavior and lifestyles play in order to outline a set of criteria that nudging can be assessed against in the proceeding chapter.

A major cultural aspect of the ecological crisis is embodied in the modes of consumption. Carolan (2004) thus starts his critique of ecological modernization by recognizing its negligence of the determining factor consumption, or rather overconsumption. He demonstrates how the strive for "super- (eco) efficiency" alone will never lead to a reduced resource extraction and the mitigation of climate change if at the same time consumption remains the same or, which is more likely, increases (Carolan 2004: 250).

Ecological modernization is servile to the paradigm of growth, since its strategy simply builds on producing more in a different way (ibid: 252). Production and consumption has to be regarded in relation to each other since they are mutually dependent (ibid: 254). According to Carolan, this is the major flaw of ecological modernization and despite many other aspects being criticized, for the purpose of this thesis the here depicted discourse of alternatives will focus on the characteristics of consumer behavior and changes towards consumption reduction or *sufficiency*.

Bauman's considerations about consumerism pointed out in the introduction vividly illuminate the deeply rooted role of consumption in Western societies and the identity-shaping meaning of commodities. This relation between consumers and commodities is especially inherent in the Marxian concept of fetishism according to which commodities within capitalism are idealized by the consumer into "social things whose qualities are at the same time perceptible and imperceptible by the sense" (Marx 1887: 48). They are hence attributed a social competency that exceeds their material reality. Hornborg (2014: 121) argues that fetishism is particularly present in the relationship between "man and machine" or else between consumer and technological object. This leads to the disguise of the unequal exchange that is embodied in the prominent practice of outsourcing the production of technological products in order "to locally save time and space [...] at the expense of (human) time and (natural) space lost elsewhere in the world" (Hornborg 2014: 122). The consumer society under its delusion for consumption is hence exploiting the global natural and social environment for the sake of supposedly exercising its power by choosing endless amounts of objects without realizing how fetishism instead puts the consumed objects into power over the consumer (ibid: 134). Breaking down these relationships, rather than optimizing the modes of production, thus seems to be imperative as well as one of the biggest challenges of current Western societies in the cause of overcoming the ecological crisis.

It is this challenge that Soper (2008) takes on by suggesting *alternative hedonism* as an opposition to consumerism. Her approach however is not based on reducing consumption to the sole "needs for physical survival and reproduction" (Soper 2008: 574), but it calls for the consideration of the "needs of the 'spirit'" as well which can be found in the pleasures of consuming differently (ibid: 571). The motivation of choosing ways of consumption that have less or as little social and environmental impact as possible should not have to be altruistic but individually beneficial in a sensory experience (ibid: 572). Soper illustrates this with the example of the recreational pleasures that can be gained by walking instead of taking the car (ibid). Correspondingly Bauman (2005: 31)

states, “[t]he consumers must be guided by aesthetic interests, not ethical norms”. Alternative hedonism demonstrates a way of finding the aesthetic intrinsic utilities in different kinds of consumption that consumerism first denies us (ibid: 578-579) and then offers to compensate through the features of mostly technological products, namely “more free time, less stress, more personal contacts, a slower pace of life, etc.” (ibid: 576). These utilities have been recognized by some people as essential to an alternative idea of the *good life* (Soper 2007: 211) challenging “the affluent Euro-American mode of consumption, which has become the model of the ‘good life’ for so many other societies today” (Soper 2009: 3). The creation of such a vision like the alternative good life, Welzer (2011: 41) claims, is prerequisite for a rearrangement of the ingrained *mental infrastructures* that underlie our modes of consumption. Then again, in order for the good life to get into reach, it needs to be envisioned and pursued by many, for one hardly takes pleasure in walking through jammed and polluted streets (Soper 2007: 211).

According to Soper (2008: 572) the consideration of one’s consumption within alternative hedonism will result in purchasing more fair trade and sustainable products with less packaging, using less plastics, preparing food at home, choosing activities with little or no environmental impact and so on. An important point that is not so evident in this list and that helps to differentiate alternative hedonism from the ecological modernization discourse is the reduction of consumption. Nevertheless, alternative hedonism is intended as a counter-consumerism maxim that, through new modes of thinking, enables people to disconnect pleasure from materiality and thus makes the constant purchase of more and new products obsolete (ibid: 571). This conception could then be seen as a story-line of a political discourse that describes an alternative to ecological modernization. While the strategies of ecological modernization, as seen above, are based on the efficiency and consistency of production, the alternative drawn here focuses on sufficiency of consumption and the related political and cultural practices.

Correspondingly to Soper’s idea of alternative hedonism, sufficiency strategies stand for redefining the utility or combination of utilities gained by the individual through acts of utilization of goods and services (Heyen et al. 2013: 7) and hence offer a way of putting alternative hedonism into practice. At the same time, when combining alternative hedonism with sufficiency strategies, the focus shifts towards the gains that sufficiency potentially produces for the individual which dissolves the feeling of loss often associated with sufficiency (ibid). As Paech (2013: 16) states, sufficiency is the easiest, most necessary and concurrently most unpopular sustainability principle. The consumer society in its excessive hoarding of basically everything has created a wall of fear

towards the idea of waiver. The more one accumulates, the more there is to lose and so waiver becomes increasingly inconceivable (Paech 2016: 73). By far more convenient is the option to trust in technological solutions to deliver the needed ecological relief and maintain the well-groomed consumption patterns with the alleged eco-friendly substitutes (ibid). Paech is a pronounced critic of ecological modernization and the assumption that further economic growth could in any way be beneficial for or even decoupled from the planet's condition (ibid: 70). He illustrates that there are no sustainable products and services on offer, but that they can only become sustainable by being consumed in a sustainable manner, that is, in an ecologically and socially bearable amount. Sustainability parameters of consumption must hence focus on the individual expenditure, like, for instance, the *ecological footprint* does, and not on countless produce with low environmental impact (Paech 2015: 101-102).

Paech's vision is a post-growth economy that presupposes sufficiency on the consumer side and subsistence as a greater structural framework (Paech 2016: 70). Similar ideas are presented within the degrowth concepts and movement (see www.degrowth.org). In terms of sufficiency, Paech points out that its negative connotation is not justified since it has the potential to increase rather than decrease the personal happiness eventually (Paech 2016: 74). He argues that the current abundance of goods leads to a reduction of the utility of every single good as utility can only be gained through the investment of time which is an exhaustible resource itself. The more goods one consumes, the less time can be spend on each of them whereas a smaller amount of goods can be enjoyed more consciously. Similar to Soper, Paech suggests a slowdown and downshift not only in consumption, but in all spheres of life – private and public. That way, sustainable lifestyles can also be abstracted from their image of being exclusive to the affluent. Frugality is affordable at any time and any place, the question Paech (2016: 73) raises is rather how this can be transported to the broad audience, how sufficiency practices can be embedded into hegemonic logics. The now following analysis will show whether nudging might offer an answer to this question.

4 Nudging – Between the Discourses

This chapter focuses on the analysis that is supposed to shed light on the developed research questions. First, a coding scheme will be designed which will then serve as a generalized tool to approach all the selected twenty studies with and enable an analysis on a common ground. At the end, a summary of the analysis will point out the most striking findings.

4.1 The Analytical Coding Scheme

In line with the above outlined theories in section 3.2 and the method of qualitative content analysis as described in section 3.1.3, the structure for the following analysis in form of analytical categories shall be put up. Each of the theories raises questions in the light of nudge theory that need to be investigated upon in order to address the research questions. Thereof the categories of analysis can be derived. The listed questions below have constantly been revisited throughout the analysis to secure their adequacy in the face of the studies to be analyzed.

Political Ecology and Power Structures

A political ecology approach raises many questions on the circumstances of the politically addressed relation between humans and the environment. However, this analysis is restricted to important but rather obvious aspects of power as the focus lies in the contents of the nudges in relation to the discourses. The questions to be addressed are:

- What is the expressed goal of the nudge?
- Who is the choice architect?
- Who are the choice makers?
- Who else is involved (i.e. in the implementation of the nudge)?

Ecological Modernization

The definition of ecological modernization practices that Hajer in supplementation of others brings forward contains several aspects that are merely relevant on the corporate level and not so much applicable for the end-consumer perspective. This results in the restriction to these categories:

- Is ecological modernization supported by the nudge in terms of
 - an aspired increase of efficiency?
 - an increase of the consumption of greener and cleaner products?
 - the use of new technologies?
 - the conservation and management of scarce resources?
 - further aspects like the promotion of sustainable waste treatment?

Alternative (Non-)Consumption

The categories set up under this theoretical framework refer to some aspects of a counter-discourse as put forward by different scholars and outlined in section 3.2.3.

- Is an alternative way of consumption addressed by the nudge in terms of

- consuming less through a change of habits (waiver, repair, reuse)?
- loosening commodity/technology fetishism, explicitly through “using instead of owning”-concepts?
- measuring the individual environmental impact?
- further aspects like reducing waste?

Based on the hypothesis that a major distinction between ecological modernization and the counter-discourse in terms of human behavior can be found in its substantiality which can be expressed through a focus on the long-term effects of political measures, the following question is added to the catalogue:

- Are there remarks about the (expected) long-term effects of the nudge?

4.2 Nudging for Sustainability – The Analysis

In “Nudging: A Very Short Guide” Sunstein (2014) lists ten different types of nudges that are most relevant when it comes to policy making. As they appear to trigger behavior in distinctively varying ways, it seems reasonable for this analysis to consider the potentially diverging results linked to each among the ten types. This is what the next ten sections intend to deliver. It will be easiest to relate to the findings of the following analysis by taking the coding sheet for each study into account which is provided in the appendix of the thesis. The coding sheets include direct quotes from the studies assigned to the distinctive categories. In order to simplify references to the different studies, they have been given short titles which shall help the reader to easily relate to their content. Some of the studies include more than one nudge type, in that case they will be introduced with the nudge that is most relevant but still be mentioned in the other sections. Also, it will be signified in parentheses during the description of the study when there is another nudge applied. If a nudge type is not part of the Top 20 selection, it will be introduced anyways, if possible accompanied by examples from the broader ConPolicy database, but it will not be put under scrutiny in the same way as the other nudge types which is justified by its apparently lower relevance to policy-making. Statements in relation to the assessment of the political ecology framework and power relations as outlined above are not necessarily made regarding every single study, but will mainly be bundled in the discussion of chapter 5 for the sake of a more comprehensive appraisal.

4.2.1 Default Rules

As already highlighted in chapter 2 by the example of organ donation, changes to the default policy can represent very powerful and even law-like nudges if designed

appropriately (see Smith et al. 2013: 160). Choice architects of default nudges assume that people are inert and tend to procrastinate, and therefore do not bother to switch default settings that have a positive or at least less negative environmental impact (Goepel et al. 2015: 40). Alternatively, default nudges take effect because the default setting is understood as a recommendation and therefore choice makers stick to it; or because they consider the default as their possession which implies a loss in giving it up (Smith et al. 2013: 161). Defaults are especially effective if the choice maker does not have any background knowledge of the matter of concern, because the costs of switching to a different option increase with the need to first get informed (Sunstein and Thaler 2003: 176). Moreover, by sticking to the default, people might feel less responsible for the consequences when they otherwise had to weigh financial benefits against moral convictions (Pichert and Katsikopoulos 2008: 65), as is often the case with environmentally benign behavior. "Generally, although they are free to do so at any time, most people simply do not change the default" (ibid). Probably due to their strong effects, default nudges are well represented in the Top 20 selection. Five case studies that include default nudges are part of the analysis: *duplex printing default*, *green energy default*, *small bins default*, *no junk mail stickers* and *buffet arrangement*.

The *duplex printing default* was conducted at a large Swedish university by Egebark and Ekström (2013). It consisted of changing the default setting of university printers in 18 departments from simplex (one sided) to duplex (both sided) printing. The result was a 15% drop of paper consumption from the first day on which remained continuously. The main target was an increase of printing efficiency in terms of paper use which is in line with ecological modernization. Even though this implies a reduction of paper consumption, this reduction is not reached through waiver on the part of the university's employees. They were able to keep printing the same amount of pages as before while saving paper – as they did. The other message of this information is that there was no rebound-effect detectable, the employees neither printed less, nor more pages in the cause of the default. For further implementation Egebark and Ekström suggest governments to approach printer manufacturers to equip their printers with default duplex printing.

Pichert and Katsikopoulos (2008) gathered insights on the *green energy default* from two natural experiments and two complementing lab experiments. The location of the first natural experiment was Schönau in the Black Forest in Southern Germany. An incumbent energy provider was only offering green energy introduced by an initiative against nuclear power in 1997. Despite an initially large group of opponents to this

measure, hardly anyone switched the provider when the energy market was liberalized one year later. The same success for green energy supply was achieved in the second natural experiment where another incumbent energy provider in Southern Germany offered its customers to choose between three different tariffs while in the absence of a reaction, a green energy tariff would come into effect for them. Due to the sole aim of shifting towards alternative energy generating schemes enabled through new technologies, this case study presents nudges that are especially characteristic for the hegemonic environmental discourse in Germany. Ideas from the counter-discourse cannot be identified here. This raises the interest in the power structures that are present here. They highly depend on who initiated the new default for which reasons. In Schönau the initiative is rooted among the citizens who basically nudged themselves. For the other example, the energy provider's motives behind the default are unclear. Realizing a nation-wide, government driven implementation of a green energy default would mean a major intervention in the cause of ecological modernization.

The case study presented and commented by Gulland (2015) works with a *small bins default*. The waste bins of 140,000 households in Edinburgh were replaced by smaller ones in order to force people to reflect on their waste treatment and enhance recycling. It succeeded well with an increase of recycling rates by 85%. Gulland therefore requests its expansion to the whole city. In regard to recycling, the nudge is found to be drawn from the discourse of ecological modernization. What remains unmentioned by Gulland though is the potential of smaller bins to nudge people to generally produce less waste. Counter-hegemonic ideas might therefore be addressed without being recognized by the choice architects from the Edinburgh City Council themselves. This can be understood as a sign for their allegiance to the hegemonic discourse. It should be noted that the nudge is to be seen in the broader context of the suggestion of a circular economy for Scotland which is striving for "sustainable economic growth" (Ellen MacArthur Foundation n.d.: 13) and hence places itself within the linguistic hegemony. Moreover, this default seems rather difficult to opt-out from as households cannot keep the bigger bins or get them back, their only option besides recycling (or reducing) waste is to store it at a different spot. This and the fact that Gulland himself speaks of a successful manipulation of the people's waste treatment, reveals firstly the city council's strong influence that is exerted, and secondly that the way the nudge is implemented and understood does not conform with the nudge definition given by Thaler and Sunstein.

In the fourth case, executed by Liebig and Rommel (2014), "no junk mail" stickers were distributed among households in Berlin in order to propose an easy way of reducing

resource extraction and energy use expended on junk mail production. Two ways of distribution were applied. Some received the stickers in their mailbox and could choose to take the action and attach them (→ increase in ease and convenience) while others found the stickers already half way attached and were thus forced to either remove or completely attach it. The results show that 16% of the stickers were attached in the active choice trial, and 22% in the forced choice trial which is considered a default. The found difference is significant. The qualitative content analysis shows that signs of both discourses are present in the case study. In terms of the counter-discourse on the one hand, people do express waiver by attaching the stickers to their mailboxes, although the substantiality of this change is questionable due to the fact that junk mail is hardly read. Also, there is the potential of reducing Berlin's domestic waste – with the risk of simply displacing it to other places. On the other hand, the study suggests the shift to other ways of advertisement substituting junk mail which are based on technologies and depend on energy and innovation. Focusing on those will enable more precise and adequate ads for every household, with the chance of enhancing more and more consumption which is essentially counteracting the counter-discourse. Furthermore, an actual reduction of junk mail production is dependent on the advertisement industry's response to the decline in demand. To optimize the effect, the nudge needs to be implemented in a greater area, possibly the whole country. In that case the risk of waste displacement would be banned as well, whereas the rebound-effect through electronic advertisement would remain. The researchers, who are the choice architects in terms of the case study, suggest that prospectively landlords and landladies guided by a governmental nudge policy can take over the part of handing the stickers to their tenants. Consequently power would be mainly executed by the government on the landlords and landladies, the action that is left to the tenants is marginal, but so is the personal effect on them.

The way *buffet arrangement* is carried out can have great influences on the food choices diners make as Wansink and Hanks (2013) found in their field experiment. They compared diners' food choices at two differently arranged lines of a conference breakfast buffet – one starting with cheesy eggs and bacon and the other one starting with fruits and low-fat yoghurt – and discovered that more than 75% of the diners took the first food they were offered and that succeeding choices were dependent on that first food. Taking cheesy eggs first lead people to taking 31% more items than taking fruits first. The order in which food is arranged on a buffet can be seen as a default setting that people can easily opt-out from and might be an effective way of promoting healthier foods to fight

obesity, but could also be applied for foods with a small CO₂-footprint to fight global warming, for instance. What is shining through here is the high complexity of the topic nutrition in regard to nudging or environmental politics in general, since the healthiest foods are not necessarily the most environmentally friendly ones and eating less or only low-caloric food is not per se a good health advice for everyone (even in the Western world). The general health aspect is, according to the analysis, not directly addressed in ecological modernization theory, this particular case of a buffet arrangement nudge is thus not touching upon ecological modernization. It might be more of a topic within the counter-discourse, though, as incorporated in the idea of the good life. The nudge itself has shown to be capable of reducing food consumption at a buffet – this presents a useful insight to the counter-discourse if applied in a broader frame which also puts the food arranger into a powerful position against the diners. However, the long-term effects are uncertain or even doubtful as the waiver of (certain) food at a buffet seems likely to result in rebound-effects (i.e. due to the impression of having “earned” some kind of compensation).

4.2.2 Simplification

Nudging through simplification mainly refers to the reduction of complexity when it comes to bureaucratic structures and procedures. It can be applied to increase the enrollment to existing programs by simplifying the enrollment papers (Sunstein 2014: 585). As Sunstein (2013) in his book “Simpler: The Future of Government” stresses, the simplification of administration bears a big potential of saving time and money not only for the institutions involved, but especially for the citizens. The idea is to compose better understandable forms and systems of enrollment that break down their utility and implications so that citizens are more likely carry out the intended action instead of surrendering in the face of excessive demands due to high complexity (Sunstein 2014: 585).

Unfortunately, there is no case study within the Top 20 selection that applies simplification, thus the nudge will not be in the focus of this analysis. However in the extensive database a report can be found that presents the results of consumer behavior studies that “examine the response of residential and small commercial customers to time-based rate programs that are implemented in conjunction with the deployment of advanced metering infrastructure (AMI) and customer systems such as in-home displays (IHDs) and programmable communicating thermostats (PCTs)” (US Department of Energy 2013: iii). There are different enrollment designs from different stages of the process tested in the studies in terms of their success or retention. Independently of the

results, it becomes obvious here that the assessment of the nudge in regard to the discourses is entirely bound to the content of the program the nudge supports. Although this example certainly carries the spirit of ecological modernization through its purpose of distributing new efficiency enhancing technology like smart grids among US citizens, it is still conceivable that a program for a local repair system for electrical household devices (as a random idea) benefits from simplification. In such a context the nudge could be considered fruitful to the counter-discourse as well. Concerning the executed power, it is per definition a relation between government and citizens that is of interest. Whereby the potential benefits for the citizens are quite high as they are supposed to be enabled to better judge the programs suggested to them.

4.2.3 Uses of Social Norms

While the sole information about the negative impacts of certain actions is often not sufficient for people to change their behavior as described by the attitude-behavior gap, comparison with other people can be a strong nudge, especially when exercised with close local connection and a high level of precision (Sunstein 2014: 586). As Mont et al. (2014: 48) describe in their report on nudging for the Swedish Environmental Protection Agency, social norms offer an orientation to people in situations when they are uncertain about what is socially expected from them. Also, many people claim that they are only willing to engage in environmental protection if everyone does it, as a study on environmental consciousness in Germany shows (Wippermann et al. 2008: 11). In some cases it is even effective to inform people about what most people consider to be the desired behavior in order to nudge certain reactions (Sunstein 2014: 586), “gentle suggestions of what might be a general consumption norm can alter what or how much a person consumes” (Wansink et al. 2014: 5). There are four nudges to be found in the study selection that make use of social norms: *partitioned shopping carts*, *sustainable transportation norms*, *water use norms* and *energy saving accounts*. The latter of which will be presented in relation to its main mechanism disclosure in section 4.2.5.

Based on findings from prior research “that partitioning creates vivid categories that can influence allocations involving simultaneous choices” (Wansink et al. 2014: 7), Wansink et al. (2014) have conducted field experiments in US and Canadian supermarkets to test the impact of *partitioned shopping carts* on purchase behavior. They equally divided shopping carts with yellow duct tape and assigned one half of the cart to healthy foods like fruits, vegetables, dairy and meat and the other half to everything else. Customers entering the supermarket were asked to participate under the pretext of a taste test and were either equipped with the partitioned carts or with regular carts as a control group.

The participants' receipts together with their answers to a short questionnaire subsequent to their shopping were then evaluated with regard to the partitioning effects. The researchers repeated the experiment and added different partitions of 35% to 65%, changed the categories to "fruits and veggies" versus "meats and treats" and gave out flyers highlighting either the health benefits of healthy foods or the overall cost-effectiveness of healthy foods. Measured by dollars spent on the different items, the share of healthy foods increased by 122% in the first experiment. The second experiment showed an increase in healthy food purchase related to the bigger size of the "fruits and veggies" section of the cart as well as related to the health promoting flyers which stressed the social norm suggested by the partition.

This nudge causes similar problems for the analysis as the *buffet arrangement*, since they both tackle primarily health issues related to food. As the researchers acknowledge themselves, the categorization of healthy and unhealthy foods is rather complex. The different ways of labelling the sections in the two experiments have different impacts on the ecological footprint of the resulting contents of the shopping carts. In the first case the GHG intensive dairy and meat products are considered healthy foods, while the second experiment assigns them to the unhealthy section. The researchers suggest that the social norm could also be created around other categories such as natural and processed foods or, for instance, organic and conventional foods. Either way, the focus lies first and foremost on an increase of consumption, be it healthier or greener, and exposes the nudge as eco-modernist. Despite the potential side effects that consumption of the "anti-norm products" decreases simultaneously and the positive experience from this small change is transferred to other parts of life, the hegemony prevails. This is also represented in the way the nudge is constructed in the study as it is in the retailers' power to design their carts anyway they like. However, the researchers also suggest that customers can arrange their own individual partitioning depending on their original shopping intentions and therefore nudge themselves.

In the case of *sustainable transportation norms* Kormos et al. (2014) asked students and employees of a Canadian university to reduce their personal vehicle use by 25% (→ precommitment) and report their daily transportation behavior over a period of three weeks via two booklets. The participants were divided into three different groups, a control group, a low social norm group and a high social norm group. Through the booklets they received for their transportation report, the two social norm groups were informed about the alleged car use reduction of former participants to different degrees. It turned out that the car use reduction during those three weeks was not significant,

however there was a notable increased success related to the degree of the social norms the participants were confronted with. The high social norm group hence made the biggest effort. Since the target in the experiment concentrated on reducing “single-occupant vehicle use”, it subliminally aimed for increasing the efficiency of transport among the university students and employees. Depending on which alternative way of transportation they chose, the nudge can be claimed successful in terms of either ecological modernization or the counter-discourse. Whereas it should be noted that the lines are quite blurry. All the alternatives to using the own car that is parked just in front of the dwelling entail a major extent of waiver of convenience, privacy and flexibility and therefore a change of transportation behavior in the experiment might be symptomatic for a mental shift that is needed to establish new transportation patterns and realize their inherent benefits (as described by Soper). But this can hardly be assumed on the basis of a three week experiment as the researchers point out themselves. The different modes of transportation and their environmental impact present a complex web that is dependent on many different factors, the individual commuting distance being an essential one. Nevertheless does the sole differentiation between single-occupant car use and all the other ways of commuting not reach the more extensive requests of the counter-discourse. For the future implementation of nudges like this, it could be interesting to investigate further on the role of the choice architect and whether the kind of organization that is communicating the social norm has an influence on its adaptation by the choice makers, since trust in the truthfulness of the information is a supposedly important prerequisite.

Bernedo et al. (2014), in their investigation on *water use norms*, have taken up the results from an earlier study with the aim to identify a nudge’s long-term effects. The subject of the basis study was the effect of a social norm on the water use of the residents of Cobb County in Georgia, USA. As a measure against an ongoing drought, the county’s water conservation coordinator sent three different letters to the residents. One letter simply contained information on how to reduce water use, its recipients formed the control group of the experiment. Then there was a weak social norm group which was informed through individual letters about the ongoing drought and encouraged to follow the enclosed water saving tips. Another group was confronted additionally in the individual letter with a strong social norm created through a comparison of the personal consumption with the county’s average consumption in order to convince the residents of their duty to save water. Both social norm applications were deemed cost-effective by the water utility with a 2.7% reduction through the weak norm and a 4.8% reduction caused

by the strong norm within the target period of four months. Bernedo et al. were particularly interested in the effect of the intervention over a longer period and found that the reduction over five years after the test period was even bigger than during.

Water conservation is directly stated to be the nudge's objective which is a major aspect of ecological modernization. However, the manner it is supposed to be reached through, namely a reduction in consumption, can generally be in line with the counter-discourse. The distinction then lies in the concrete suggested measures that can lead to a reduction which was on the one hand the use of more water efficient technological appliances and on the other hand the change of habits. Thus, both discourses can be identified to a rather equal extent. Especially the results from the long-term observation hint towards a successful establishment of new habits of more conscious water consumption and are of particular value to the counter-discursive ideas. The power that was made use of by the water conservation coordinator seems to be legitimized by the drought the county was facing. Stricter and probably still appropriate interventions could have been to officially restrict water use to a certain amount or prohibit watering yards, for instance.

4.2.4 Increases in Ease and Convenience

Another approach that is considered a nudge is based on an increase in convenience through changes to the physical environment (Mont et al. 2014: 25). Sunstein (2014: 586) suggests to make the good choices easy. When behavior is marked by ambiguity, he argues, the easy choice is most likely to be preferred. Convenience triumphs over long-term well-being because the priorities in the moment of decision are imbalanced towards current instead of future benefits and costs (Hanks et al. 2012: 1). Many nudges in the selection that work with an increase in ease and convenience also include disclosure in their design as will be marked during the description. One increase-in-ease-nudge was already presented in section 4.2.1 as part of the *no junk mail stickers* field experiment. Six more nudges will be described and analyzed in this section: *healthy convenience*, *menu positions*, *power down switch*, *open bicycle scheme*, *carpooling platform*, *public transport intervention*. The latter three concern modes of transportation, a popular field for increasing ease and convenience.

The *healthy convenience* nudge design might seem very similar to the one of *buffet arrangement*, yet they trigger different mechanisms. While *buffet arrangement* builds on the assumption that diners at a buffet are most likely to take the first food they are offered which creates a default situation that depends on the order of the offered food, *healthy convenience* focuses on shifting the convenience aspect from unhealthy to

healthy food. In order to test the effects thereof, Hanks et al. (2012) set up a convenient line in a US school's lunchroom that only contained healthy foods. A second line kept the common structure offering a mixture of foods. The outcome was a significant decrease of unhealthy food consumption and a steady healthy food consumption. Hence, connecting convenience to healthy food does have a positive impact on nutrition intake. Again, health is not so much a matter of ecological modernization which limits the analysis of this trial. Regarding the counter-discourse the nudge might have an important angle by approaching eating behavior at an early age with potential long-term influences. However, the relevance of convenience in relation to food could be questioned from the perspective of alternative hedonism which rather promotes a slower pace in daily life.

Another "food nudge" with the short title *menu positions* is suggested by Dayan and Bar-Hillel (2011) who tested the influence of the positions of dishes in restaurant menus on their popularity. The extremes of the lists (first and last positions) within each food or beverage category turned out to be the most attractive to the visitors of the café in Tel Aviv participating in the study. This might be due to the extreme positions' easier approach for the choice maker who is scanning the menu, but the exact reasons are not covered by the study. Dayan and Bar-Hillel suggest to use this knowledge to "nudge for nobesity" and hence to place the healthier dishes on the edges of the menus, but they also note that restaurants could follow many other, personal agendas with this strategy. The extent to which this nudge can be beneficial to either of the discourses is very limited for similar reasons as mentioned for the preceding food nudges. It would be more relevant if a restaurant had the agenda to promote organic, regional and seasonal food, for instance, but this speculation does not allow a proper analysis.

Power down switches are introduced by the program Relish which stands for "Residents 4 Low Impact Sustainable Homes" (Worthing Homes 2014: 2) and is conducted by the social landlord Worthing Homes in the UK. Aim of the program is the reduction of energy costs for the residents and energy related emissions. In this cause Worthing Homes equipped some of their houses with the so called Smartwire that enables residents to switch off all the electronic devices connected to it at the push of a single button that is affixed at a prominent spot. This way people can easily prevent the energy uptake of all the momentarily unneeded devices while they are asleep or not at home. Additionally to the Smartwire installation, people also received the Relish-it! advice concerning its application (→ disclosure). Depending on the size of the dwelling the average annual electricity consumption declined within 12 months of the program by 13 to 23%. What is evident in this case is its strong dependence on new technologies that

are supposed to realize energy efficient housing and enable the sustainability goal, combined with a broad stakeholder engagement that is also characteristic for eco-modernist inspired processes (see section 3.2.2). On the other hand, the program certainly also depends on the people adapting new habits and awareness for their energy consumption which is clearly stressed in the report, even if it is a rather small effort they have to make. Once the devices have been plugged to the Smartwire, the new habit simply consists of turning a switch before leaving the house or going to bed. While the counter-discourse is aiming for bigger changes of habits and would recommend the reconsideration of the amount of technological devices in a household instead of just reducing their overall energy uptake, the nudge does prove a relevant point on easing a change of habits that might be transferable.

Just like many metropolises, London has an *open bicycle scheme* that is spread throughout the city and enables people to flexibly hire a bike from one station and return it at another. London's scheme required membership when it was first launched, but was soon opened to casual cyclists to check out bikes via credit or debit card which meant a significant increase in ease and convenience. Lathia et al. (2012) analyzed this particular shift of policy and its implications on bike usage through the collection of quantitative data from the different stations. Additionally, to the easily determined increase of trips within the scheme, they found that not only casual weekend trips, but also the supposed commuting trips during weekdays had expanded. While the study obviously does not cover information on the modes of transportation for commuting that were replaced by the bike scheme, it is somewhat safe to assume that some of them were motorized. In general, the particular analysis presented by Lathia et al. is, due to its sole quantitative approach and focus, not very meaningful when it comes to questions of behavior change caused by the nudge. Nevertheless, a successfully implemented bike hiring system could be an important complement in an urban structure that reproduces the counter-discourse. Moreover, it entails the potential to nudge the conceptional shift from owning to only using. Still, a main feature of the nudge that represents an important part of the system's convenience is the technology that it depends on and that is intended to be developed further. As the researchers point out in terms of policy-making, schemes like this are directed by municipal policy and their functioning is immensely reliant on a thorough understanding of the interplay of their design and usage. The choice architect thus faces a great challenge in comprehending those structures in order to reach the choice maker at all. The executed power is therefore rather vague and not so relevant.

Abrahamse and Keall (2012) present the case of a *carpooling platform* that was introduced by the Greater Wellington Regional Council (New Zealand) in order to facilitate the formation of carpools and also to discourage single-occupant car use by informing them about the negative financial and environmental impacts (→ disclosure). Abrahamse and Keall conducted a survey among the platform users to estimate the success of the measure. The results speak for a progress towards both discourses. On the one hand efficiency could be enhanced which represents the major objective of the nudge and is portrayed by a significant increase of carpools. On the other hand the small side effect of more people walking or cycling to work was detected, and the platform incorporates the idea of using instead of owning. Ecological modernization concepts still seem to outweigh the counter-discourse as carpooling, and this nudge in particular, offers a way to keep using personal cars even though there are even more efficient modes of transportation such as public transport which has declined under the carpooling enhancement.

Another measure addressing congestion and air pollution was taken under scrutiny by Bamberg (2006). He was interested in the impacts of a *public transport intervention* carried out in Stuttgart, Germany. Based on the theory that so called moments of change serve as a suitable opportunity to enforce people's change of habits, Bamberg selected people who intended to move to Stuttgart and approached them before and after the move in order to identify differences in their attitudes, intentions and behavior. The *public transport intervention* the participants received shortly after their arrival in Stuttgart consisted of detailed information about the local public transport (→ disclosure) and a 1-day free ticket sent to them by the public transport company in order to ease the entry to the service. Bamberg showed that this intervention in combination with the new circumstances due to the move had a significant behavior changing impact as the participants' public transport use increased from 18 to 47% and car use went down. In terms of the nudge's contribution to the environmental discourses, the arguments are rather similar to the ones of the previous two presented nudges. What is striking though is the utilization of moments of change as a promising aspect for nudge design aiming for a significant behavior change towards a smaller ecological footprint, although the researcher himself doubts its lasting effects in this particular case. Addressing people in this situation of orientation increases the power imbalance between the choice architect and the choice maker in favor of the choice architect, since it can be interpreted as making use of the choice maker's temporary weakness.

4.2.5 Disclosure

Despite the attitude-behavior-gap, providing information is still an important aspect within policies, as Sunstein (2014: 586) illustrates. The disclosure of practices, costs (economic, environmental or social) or relations in the corporate or political world can on the one hand inform civil society and lead, in extreme cases, to protests and boycott. On the other hand, the awareness of imminent disclosure can prevent dishonest practices in the first place. Important attributes of the information are good comprehensibility and accessibility in the moment of decision-making. A rather simple but widely spread way of disclosure is the labelling of products. As already marked in some of the previous examples, disclosure is often part of the nudge design. This section will present two nudges that mainly rely on the mechanisms of disclosure: *energy saving accounts* and *energy labelling*.

The *energy saving accounts* are a service of co2online, a German non-profit organization that receives funding from the German government. Their aim is to illustrate the personal energy consumption for heating to users in order to encourage them to take saving measures. Additionally, the social norm mechanism of comparing people's heating energy consumption to those of their neighbors is applied. Hengstenberg (2012) has evaluated the saving effects which amount up to a quarter of energy reduction within seven years of account usage. After that the potential measures and their reducing impact are assumed to be exhausted. Those measures can, according to Hengstenberg, consist of more energy conscious heating behavior, small investments in metering and control equipment or, in the case of home owners, big scale thermal optimizations. In that sense, the main theme of the nudge is ecological modernization. Both, the realization of the nudge (setting up the platform and the personal accounts and collecting energy consumption data) as well as the manners that lead to its success as presented in the report, are highly dependent on technology and its "progress" and only to as small extent to the people's daily actions. For a broad implementation of the nudge, co2online advises the government to reach the tenants via a regulation for landlords and landladies that demands the consequent disclosure of their heating energy consumption.

As already mentioned, a prominent way to disclose information about products is through labelling, the following case deals with *energy labelling* in particular. The Department of Energy and Climate Change (2014) under consultation by The Behavioural Insights Team ("Nudge Unit") in the UK has conducted a trial in John Lewis stores where the electrical household devices were labelled not only with the common EU energy certificate that is informing about the product's efficiency class

ranging from G to A+++), but also with a calculation of the product's lifetime energy costs. The lifetime was set to nine years. The different preparation of the information about the products' energy efficiency, now expressed in money, led to an increase of purchase of the more efficient devices in the trial stores compared to the control stores. Thereof, resulting energy consumption reductions were estimated and found significant only in the case of washer dryers for they need a lot of energy in general and hence bear the biggest potential for improvement. Nevertheless, the trial was deemed useful to inform the optimization of the nudge design which is also the only respect in which the relation between efficiency and proper application of the devices is being remarked as noteworthy. Otherwise, the presence of the eco-modernist dimension becomes obvious throughout the whole approach in its efficiency objective. Although, one could argue that the nudge is not promoting an enhancement of consumption of efficient products in general, but only towards people who have already expressed the intention to buy a new device by coming to the store. Consequently, the question whether the actual need for such a product is given could be raised. The finding that the effect was consistent throughout the trial period of six months does not come as a surprise as the mechanism is always addressing new customers with similar intentions which are not being questioned per se.

4.2.6 Warnings

Warnings can be applied when there is a serious matter such as health at stake (Sunstein 2014: 386). They should be flashy and vivid in order for them to “counteract the natural human tendency toward unrealistic optimism and simultaneously increase the likelihood that people will pay attention to the long term” (ibid). Sometimes it is helpful if they are equipped with instructions on how to reduce the risk or with the announcement of a reward for heeding as a more positive note that prevents the potential discounting of warnings (ibid). In general, it has proven to be more effective to indicate the losses associated with a certain behavior rather than the gains (Momsen and Stoerk 2014: 378). Warnings are not explicitly present in the Top 20 selection which might be due to their lack of novelty. There might be traces of warnings within other nudges, though, like the *water use norms* or the disclosing *energy labelling*. Typically warnings disclose particularly critical information in the form of very noticeable signs and graphics. The way hazard information on cleaning agents and other chemical substances is presented could be considered such a nudge.

4.2.7 Precommitment Strategies

People are more likely to procrastinate less and reach their goals if they have officially formulated them and set a date by which they intend to complete them (Sunstein 2014: 586). Fujii and Taniguchi (2005: 386) distinguish between behavior intention and implementation intention. While the presence of the first is certainly necessary to start with, the development of an implementation intention as concrete as possible increases the probability of its execution. The deployment of such precommitment strategies does also fall under the term nudging. Governments could encourage citizens to set up personal goals that are likewise beneficial for the individual well-being and the political agenda.

Fujii and Taniguchi (2005) inform such policy-making with their experimental study on a *travel feedback program*. At an elementary school in Sapporo, Japan the students of the fifth grade were undergoing an educational project about global warming where they learned about the influences of excessive CO₂ in the atmosphere and how car-use is contributing to those. This is where the researchers embedded their study. They split the students with their families into two groups, the advice and the planning group. The advice group received personal information on car-use emissions and reduction possibilities (→ information on consequences) on the basis of a questionnaire which all participants had completed in advance. They were also requested to keep a travel diary over three days. The planning group was instead asked to formulate a concrete plan on how to reduce the family's car use. Concludingly, the same questionnaire from before was used again to determine the changes in car-use behavior. A significant reduction of 28% in total trip duration and 12% in car-use days was achieved by the planning group. This result could be seen as a success in car-use waiver and hence representing counter-discursive images, only the lack of knowledge about how the people arranged their travels instead limits the validity of that conclusion and brings up similar issues as discussed for the other transportation nudges from section 4.2.4. Although the advice group did not reach a significant car-use reduction, the intervention they received in terms of illustrating the personal CO₂ emissions produced by their travels approaches, at least on a small scale, the concept of individual impact accounting as recommended by Paech in relation to the counter-discourse.

4.2.8 Reminders

A “combination of inertia, procrastination, competing obligations, and simple forgetfulness” (Sunstein 2014: 587) often leads to the omission of certain important but rarely joyful tasks like paying bills. The reception of reminders at the right moment

could significantly improve people's personal fulfilment rate (ibid). Although there is no reminder nudge to be found in the selection, some of the research processes presented here used reminders in order to secure the participants' replies. Reminders are also an important part of the concept applied by Keene et al. (2015), the main object of which is a computer game that is supposed to encourage the players in their sustainability performance. In order to keep people in the game, reminders in the form of daily e-mails are sent to them (ibid: 4). Hence, reminders might serve as enhancers to the effects of certain nudges.

4.2.9 Eliciting Implementation Intentions

This nudge seems to be related to precommitment strategies, only in this case people's intentions are brought up by externals. This works either through addressing people and precisely asking about their intentions in regard to decisions or actions that should be taken soon, or through reminding people how they have acted before in order to encourage them to precede this way (Sunstein 2014: 587). This effect is "based on strengthening self-perception with people determining their attitudes from observing their own behaviour" (Cotterill et al. 2009: 404-405). The method was found to be most effective when applied in a face-to-face manner (ibid: 404). Since this nudge is not a component of the selection either, a short example from the broader database will be given. Cotterill et al. (2009) have conducted a trial in Trafford Council, UK where they performed doorstep canvassing to promote recycling. Households were approached by a canvasser who first checked the people's knowledge about the local recycling system and then enthusiastically encouraged them to increase their recycling rate. The treatment effect was measured by the amount of recycling bins that were put outside by the households after the treatment compared to the amount of bins that had been counted before the treatment. Recycling rates increased by about 5% during the first three weeks, but the effect had declined after three months showing that the nudge had failed to establish new habits and therefore does not conform to the maxim of long-term behavioral change demanded by the counter-discourse. The researchers suggest reminders as a complementary measure to maintain the rates in case of implementation. In terms of its objective, the nudge is similar to the *smaller bins default* and therefore in line with ecological modernization. Due to the missing long-term effect, at least in this particular example, the nudge does not seem very promising independently from its utilization within one or the other discourse despite its high expenditure.

4.2.10 Information on Consequences of People's Past Choices

The hypothesis indicates that people are often not aware of the consequences of their actions or omitted actions. Illustrating the relation of people's behavior directly to economic, societal or environmental consequences might encourage them to overthink it (Sunstein 2014: 587). As the examples *energy consumption feedback*, *smart water meters* and *eco-driving app* will show, feedback systems on consumption are a popular tool applied by choice architects that take up on the indicated hypothesis.

Schleich et al. (2011) report about a study in Germany and Austria, which was run in the context of the EU directive that proposes the gradual installation of smart meters in EU households. Benefits of *energy consumption feedback* in households enabled by smart meters were identified in order to consult policy-makers how to deal with the directive. The trial took place in one Austrian and seven German municipalities and consisted of a pilot group that received the consumption feedback either through a web-portal or through monthly mails, and a control group not receiving any feedback. Over a period of at least one year, energy consumption patterns were collected from each municipality which revealed an average decrease of energy use of 3.7% in the pilot group. What is striking about this nudge in terms of the analysis is first of all its prerequisite of a broad smart meter installation which in some cases might implicate a discarding of old but working and reliable electricity meters and therefore a clearly preventable resource extraction. And the report points towards an even bigger opportunity for new products to enter the market in the cause of implementation due to an increasing demand for energy saving devices. These major aspects of the whole nudge locate it decidedly in the discourse of ecological modernization. On the other hand, the influence of changing consumption behavior and conscious energy use does play some role in the report and its long-term effect is put out to further research as an essential aspect of the beneficial effects of consumption feedback through smart meters. Hence, there are themes of the counter-discourse addressed. In case of a national program roll-out, the main force could be found in the requisite smart meter installation introduced by law, but not so much in the nudge itself. The sole information about people's amount of energy consumption can hardly be seen as a forceful act, as it leaves plenty courses of action to the consumer.

With a similar approach Tasic et al. (2012) tested the effect of *smart water meters* installed in showers of Swiss households. The meters comprise of a sensor that has to be attached between the tap and the hose and a display which is connected to the sensor via infrared communication protocol and illustrates the amount of water in liters that has

been used from the beginning of each shower session. Trial participants kept the *smart water meters* installed for three months before they returned them to the researchers for evaluation. Based on the data that was stored on the meters, an absolute water use reduction of 22% and an average reduction per household of 13% compared to baseline consumption could be identified. Again, the nudge only works under the contribution of technological innovation and the study portrays a certain contentment with the advances of technologies that might enhance the metering system. What distinguishes these *smart water meters* from the case of *energy consumption feedback* is that it decisively addresses consumption behavior and supports waiver of the luxury of long hot showers, for instance – with the tendency to establish those showering habits as the study suggests. By outlining the overall European energy saving potential expressed in the avoided CO₂ emissions of coal power plants and the equivalent avoided land use of solar panels, Tasic et al. position the study slightly apart from the ecological modernization discourse towards basic assumptions of the counter-discourse.

The third feedback system operates through an *eco-driving app* that informs drivers about the most fuel efficient ways of driving their decisive vehicle type while they are on the road. Tulusan et al. (2012) tested the app among Swiss corporate drivers in order to find out whether it has an effect on driving behavior even in the absence of a financial incentive. As it turned out, the participating drivers improved fuel efficiency by 3.2% compared to a control group. The authors deem this result significant and especially relevant to companies with a large car fleet. In stating this, ecological modernization par excellence is revealed, for the approach is simply seen as an opportunity to reduce corporate emissions while saving costs. The necessity of structural changes in terms of diminishing car fleets is not taken into account at all. Further advancement of the technology in combination with marginal behavior adaptations is believed to bring the needed savings. Both, the *eco-driving app* and the *smart water meters* depend in their assessment of inherent power structures on the means through which they would be politically implemented.

4.3 Summary: The Ten Types of Nudges In Between the Discourses

The analysis has shown that identification of the different discourses that underlie the presented nudges is not an either/or-question. A vast majority of the nudges under scrutiny have been shown to be designed under the assumption that an increase in efficiency and the development of new technologies are key factors in overcoming the ecological crisis. Ecological modernization is hence widely present as the dominating solution approach. At the same time, none of the nudges can be labelled exclusively

serving counter-discursive ideals. Nevertheless, some nudges do show potentials or at least starting points to go beyond ecological modernization by seriously addressing habitual changes which are crucial according to the counter-discourse. This will be discussed further in chapter 5. For a better overview on the studies, table 1 summarizes the results of the study analyses. The table resembles the coding schemes with the respective categories that have been used for the analyses. Other than in the sheets that can be found in the appendix containing one single study analysis each, the blanks are filled with merely quantitative summaries of the revelations of the Top 20 selection.

Title	The Top 20 Selection
Author(s)	various
Date	2005-2015
Countries	North America, Western Europe, Israel, New Zealand, Japan
Short Name	./.
Type of Nudge	Default, social norms, increase in ease, disclosure, precommitment strategies, information on consequences
Political Ecology and Power Structures	
Expressed Sustainability Goal	The Top 4 goals: 1. reducing emissions, 2. reducing energy use, 3. fighting obesity; reducing traffic congestion, 4. generally reducing the environmental impact
Choice Architect	The majority of the studies is based on experiments and trials conducted by researchers from different fields who derive suggestions for further implementation from their findings. Those are mostly addressed at policy-makers. Whereas the studies that report about real life nudges are either related to choice architects who are policy-makers themselves or who are commissioned by such.
Choice Maker	Accordingly, most of the choice makers in the analysis are trial participants, some knowingly, some unknowingly. They are all private persons or households addressed in their everyday-life of behavior and purchase decisions.
Other Actors	Stakeholders related to the nudge are very nudge-specific, often they are the ones who would have to be on board for a further implementation of the nudge. So they would be the ones carrying out the policy as designed by policy-makers. Depending on the way the nudge is implemented, this could be a voluntary or compulsory contribution.
Ecological Modernization	
Efficiency	Increasing efficiency is a major aspect that is pursued by the choice architects of the twenty nudges. Eight of them build on an increase of efficiency, mainly in terms of energy and transportation.
Green and clean products	This category is not so much present in the selection. It is only directly pursued in terms of green energy, but could also become of interest if the healthy food nudges are transferred by policy-makers to promote organic and fair trade products, for instance.
New technologies	The use of (new) technologies is the number one component of the nudges. Nine of them directly depend on it, while others might also presuppose some kind of technological support.

Conservation	Conservation is only once addressed directly in terms of water conservation, although it cannot be excluded that it is subliminal to some other nudges.
Waste treatment	Waste treatment measures are only for one nudge the matter of concern.
Further aspects	This column is used for various aspects throughout the analysis, sometimes they concern economic issues that place the respective nudge towards ecological modernization rather than the counter-discourse.
Alternative Consumption	
Waiver, repair, reuse	Many of the nudges do achieve a reduction in consumption, but many of those are at the same time coupled to an increase of substitute consumption.
Using instead of owning	This idea is solely addressed by the transportation nudges. The studies do not allow conclusions about the actual effect of the nudges on ownership.
Waste reduction	One of the nudges explicitly indicates waste reduction, while one or two others might implicate waste reduction which remains unrecognized or at least unmentioned in the study.
Further aspects	This column is filled in five cases with quotes of the authors that hint towards potential (side) effects of the nudge that would be beneficial from the perspective of the counter-discourse.
Long-term effects	Fourteen of the twenty studies make statements on the long-term effects of the respective nudge. Three of them simply refer to it as a task for future research, three others speculate about potentials that the nudge might unfold in the future, two are pessimistic about the lasting benefits and the remaining have observed positive long-term effects over the period of the trials or even beyond.

Table 1: Summary of the qualitative content analysis of the Top 20 selection in the form of the applied coding scheme

5 Discussion

The analysis has demonstrated that the majority of nudges from the selection, and assumingly also beyond, is aiming for eco-modernist objectives which in return proves the hegemonic character of ecological modernization in environmental politics, recalling Hajer's theory. Now, for the assessment of the nudge types per se, it should be noted that a main factor determining whether the nudge can be applied in order to promote behavior that is favored by the counter-discourse, relies on its potential to establish habits and therefore also on the long-term perspective it is offering, since "high frequency and context stability are major conditions for behavior to become habitual" (Staats et al. 2004: 347). The change that is to be achieved through the nudge should be consistent and as deeply rooted as possible. A counter-discursive nudging would provide people with the gentle pushes they might need to establish habits of enjoying the consumption of fewer things, detaching from the materiality of products, bearing their

ecological footprint in mind and consequently withdrawing from the dependencies of consumer society.

Defaults might have a great impact, as the studies reveal, and they can certainly bring about some important and easy changes that are currently prevented through the prevailing default settings, but their singularity denies the mechanism actual behavioral influence that can turn into habits of consuming less. The latter also applies for simplification. Social norm application, however, could be a valuable measure with long-term influences as in the case of *water use norms*. An exemplary field of application within the counter-discourse would be the introduction of sufficiency practices in a community enhanced by comparison of the community members' progress. The idea of increasing ease and convenience somehow contradicts the concepts drawn by Soper and Paech who rather call for investing more time in less things. The whole nudge mechanism thus seems to align rather with ecological modernization and its efficiency course. Disclosure, on the other hand, can generally be an essential contribution to both discourses although its current use is probably most beneficial to eco-modernist approaches of enhancing green consumption through product labelling instead of informing about the products' absolute impact which could enable the assessment of individual ecological footprints. This assumption about the use of disclosure can also explain why warnings are not part of the selection as they might implicate negative economic effects that are counteracting the growth paradigm that is supposed to be secured by ecological modernization. Upon inversion of the argument, warnings might be a fruitful lever for the counter-discourse.

For people who are already convinced of pursuing the good life offered by the counter-discourse, precommitment strategies could be a useful tool to improve the transfer of intention into action. What is missing here is a concrete policy approach that could implement individual precommitment strategies. As already mentioned, reminders are especially useful as enhancers of other nudge types like social norms and precommitment strategies and, depending on the aims of those, could help to establish habits marked by frugality. The elicitation of people's intentions has not proven to be effective in the above presented example which might also be the reason why the mechanism is not present in the selection. While informing people on the consequences of their actions seems to be quite successful. Feedback systems that provide this service illustrate the individual behavioral impact and are in their principle a relevant asset to the counter-discourse, but, as the studies show, they often rely on new technologies and the application of technological devices. Therefore, they approach the issue merely from an eco-modernist

perspective, even though it should be noted that the discourse of alternatives does not demand a complete ban of technologies. According to the Research & Degrowth association's definition of degrowth, for instance, the goal is that "innovation will no longer focus on technology for technology's sake but will concentrate on new social and technical arrangements that will enable us to live convivially and frugally" (Research and Degrowth n.d.).

A special case is made by the nudges that seek to fight obesity with different mechanisms. A healthy population is generally considered a sustainability goal which becomes not least obvious in the third UN Sustainable Development Goal to "[e]nsure healthy lives and promote well-being for all at all ages" (United Nations 2015: 14). However, obesity is not necessarily addressed by environmental politics as a key challenge due to its primal affiliation to health politics. The reason why those nudges are part of ConPolicy's selection can mainly be found in their idea to apply the nudges in a more ecological sense and enhance vegetarian choices or the consumption of organic foods through the same mechanisms as was suggested similarly in the report on the *partitioned shopping carts*. Taking this into account during the analysis would have been highly speculative, though, and was therefore not considered.

The way political ecology comes into play within the implementation of nudges is of very varying scope. It seems most relevant to be determined regarding the scenarios that can be drawn from the policy suggestions that are made for the respective nudges instead of the observed experiments. The *green energy default*, for instance, can be considered a precedent of a nudge that places the apolitical ecology within ecological modernization in the political ecological context (see Robbins 2012). The political power that would be executed in the scenario of a nation-wide green energy default is immense and decisive. It would cut consumers' option to express their interest by consciously choosing green energy which, on the other hand is hardly done despite its general endorsement within the German society. However, the nudge takes a shortcut to create conditions that would be prevailing if everyone acted according to their environmental attitudes – an essential idea of nudge theory.

Sunstein (2015: 12-13) found that people are generally in favor of nudges as long as they support the choice architect's motivations. Their disapproval of a nudge is not so much related to them feeling patronized but rather to the effect it is supposed to cause. Every nudge should hence be checked on its accordance with the people's will before implementation. If the majority of the people endorses the goal, it is advantageous for

the choice architect, as well as for the majority of the people, to rearrange the choice architecture. According to Sunstein (2014: 584), it should not be in the interest of the choice architect to obscure their actions as “they should never take the form of manipulation or trickery. The public should be able to review and scrutinize nudges no less than government actions of any other kind”. So much for the theory. To what extent the choice makers in the presented studies are actually aware that they are being nudged is hard to tell, but it is certainly not an expressed concern of the choice architects in any of the studies to let the choice makers in on their practices.

In terms of the political power that is often assigned to consumers in their consumption choice, it comes down to the question whether this power exists in the first place. Unfortunately, it is not in the scope of this thesis to actually pursue this question. Hypothetically, though, if the question can be generally answered with yes, if the consumer-citizen equipped with market influence exists, nudging does entail a modification to the perception of consumption and the attitudes that consumers, or in this case citizens intend to express through it. Consumer behavior would no longer be perceived by the market as an expression of consumer interest, but of state interest, even though they might confirm. On the other hand, if Bauman is right and consumer power is an illusion anyways, it might be more in the interest of the consumer to be guided by their democratically elected government through libertarian paternalism than by corporations acting upon their sales agenda.

As it seems, for now it is either one or the other, but giving in on this fatalism would violate the principles of human ecology as depicted in the beginning. Moreover, it would mean to neglect that the application of nudging in the sense of the counter-discourse would aim at challenging the structures consumer society is built on, namely capitalism. In this thought experiment, nudging loses its appeal for governments dedicated to the current hegemony. Consequently, the counter-discourse has to become hegemonic before nudging as a policy tool could ever be considered “human ecologically benign”. Trawick and Hornborg (2015: 16) note that “[t]he political challenges involved in moving humankind toward sustainability in this way are of course daunting, and any effort to scale up existing cooperative institutions to the highest levels of organization will be fraught with great difficulty.” However, if people come to realize how consumption, despite the apparent affluence in the Western world, is constraint by limited goods and how the wealth that appears to be created here in fact always and ultimately leaves a gap somewhere else, following the laws of thermodynamics, they might be more willing to reconsider their consumption (ibid). This objective lets us face an “enormous task of

mutual education, communication, and deliberation” (ibid), but Trawick and Hornborg (2015: 16) have found it to be “now spreading from the earth’s margins to its political and cultural center or core”.

Somewhere in this process, when people have taken on this perspective, they might just need the last little nudges to remind them in critical situations of their intentions to create new modes of consumption. The underlying cultural changes are hardly achieved through nudging, since nudging requires not only a choice architect with an explicit aim, but also a choice maker who is in favor of the aim and appreciates the expected individual benefits. Or can nudging in fact initiate thoughts in people that go way beyond the single everyday decisions they primarily provoke and encourage them to generally reframe their concept of consumption, as Bernedo et al. (2014) and Wansink et al. (2014) as well as Hanks et al. (2012) in the reports on *water use norms*, *partitioned shopping carts* and *healthy convenience* respectively suggest? In that case, nudges could represent a beneficial tool for transitioning towards the counter-discourse even if the nudges are implemented from the current hegemonic position. Further research on “psychological side-effects” of nudging would be informative in this respect.

Considering the stances that are likely to be taken by some of the introduced representatives of the counter-discourse-coalition, the assessment of nudging per se would probably take slightly varying forms. Paech (2015: 105), for instance holds the opinion that the withdrawal from abundance he demands, cannot be initiated by the state or any other authority, but that the desire has to emerge in a bottom-up process. Soper (2009: 6) directly expresses her concern about approaches that intend to “prove that consumers ‘really’ need something quite other than what they profess to need (or want) – a procedure which is paternalistic and undemocratic”. She points out the importance of people’s own reflections that should drive them towards “the development of more sustainable modes of consumption” (ibid) which resembles Paech’s attitude. Heyen et al. (2013: 17) on the other hand, are convinced that particularly sufficiency practices will neither be established through sole state intervention nor entirely without it. They specifically consider nudging as a potential instrument that finds a balance between both, but they also note that nudging can only be one aspect of a set of political measures enhancing each other in the form of a system-innovation.

6 Conclusion

It is now time to recall the research questions posed in the beginning and to reconsider them in the light of the conducted inquiry. One will find that the first three guiding

questions have been addressed directly during the discussion. The outcome can be broken down to the following paragraphs, each dedicated to one of the questions, finalized with the fourth and main question.

Ecological modernization is present in the majority of the nudges under scrutiny. It is expressed in the choice architects' apparent belief in and dependency on technology. Technological progress is expected to bring about the required savings in energy use and resource extraction if people make use of the possibilities offered by technology. Efficiency can be reached through new technologies, but also through a more efficient application of products and services. The assumption that an increase of consumption of greener and cleaner products will help to prevent environmental damages is underlying a few of the nudges. These objectives are mainly pursued, albeit to different extents, by the nudges from the selection.

The studies have shown that single aspects that can be assigned to the counter-discourse are incorporated in some nudge designs as well. In fact, many of the nudges do aim at a reduction of the usage of certain products and services, but there are often limitations to this effect, because the choice architect does not take into account the alternatives that are made use of instead or because the nudge is only beneficial in a very limited timeframe. If nudges fail to establish new sustainable habits, they are not worth much from the perspective of the counter-discourse. However, some nudge types are conceived to be worth consideration. Particularly social norms, disclosure, warnings, precommitment strategies, reminders and, under less technological circumstances, also the information about consequences through feedback systems could be revised for the realization of counter-discursive goals.

As probably bound to its nature, the power relations that are inherent to the nudges, or rather to their implementation, are very complex. What has become evident is that no two nudges equal each other in terms of the power structures that are created around them. The implementation of nudge policy is first of all an expression of power on the side of the choice architect who decides on certain goals. Instead of introducing hard laws that would be ultimately binding, the choice architects, however, allow the choice makers to follow the suggestions or not. This is only fully true as long as the choice makers are aware of the situation, which needs to be evaluated individually. In the face of nudging, the political power that some find to be executed through consumption choices, on the one hand loses its significance if consumers agree with the choice architects' motives, but is enhanced in the case of disagreement.

Concerning the final and main research question, all of the above should be reflected upon. It has been argued that the counter-discourse can be understood as depicting a cultural approach towards consumption that is desirable from the human ecological standpoint. As the analysis and argumentation of this paper reveals, there are different levels on which a conclusion to the question to what extent nudging can be considered a useful tool in human ecological terms can be found. If nudging is applied – as is currently the case – by mainly pursuing eco-modernist ideas as an expression of their hegemony within environmental politics, the chance for a forthcoming of counter-discursive behaviors lies in the possibility that nudges initiate a thought process in the choice makers. In the most optimistic scenario, this process leads people to realize the context of their consumption and to find alternative ways for themselves to approach it, such as alternative hedonism. Obviously, this is a rather utopian outcome, but for now at least small scale steps in this direction are conceivable.

The other level on which the research question can be elaborated is the condition in which the current hegemonic logics have been replaced by the current counter-discourse. If environmental politics, and politics in general have taken on the human ecological worldview and started to act upon it, nudging could serve as the last pushes that manifest this worldview through the establishment of truly sustainable modes of consumption in people's lifestyles. It is obvious, that this scenario is not less utopian than the first one, it seems even less realistic as it lacks an explanation on how the hegemony could ever be replaced. According to Gramsci's concept of hegemony, it always starts to form within civil society before it is inevitably taken to political society. Thus, the new ecological hegemony, just as Soper (2009: 6) and Paech (2015: 105) suggest, needs to evolve in a bottom-up process among the story-lines of the alternative good life, alternative hedonism, sufficiency, anti-consumerism, anti-fetishism and many more.

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Appendix

This appendix contains the coding scheme sheet for each of the twenty studies on nudge implementation in the order of appearance within the sections of chapter 4.

Title	Can Indifference Make the World Greener?		
Author(s)	Egebark, J.; Ekström, M.		
Date	2013		
Country	Sweden		
Short Name	duplex printing default		
Type of Nudge	Default		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	reduced resource extraction in the form of trees and hence CO2 emissions	reduction of paper use through default duplex printing at several university printers	
Choice Architect	researchers testing the nudge in a natural field experiment	"The experiment offers a number of insights that can inform public policy." (p. 3)	"Convincing manufactures to set green defaults as machines leave the factory may therefore be a fruitful strategy to reap benefits on a global scale." (p. 5)
Choice Maker	employees of 18 university departments of a large Swedish university (unaware of being part of an experiment)	"the size of the default effect depends solely on the number of indifferent individuals in the population" (p. 4)	
Other Actors	The environmental coordinator of the university transmits the information from the researchers to the test groups.		
Ecological Modernization			
efficiency	"we aim to fill in parts of this gap by testing whether a simple change in the default can improve efficiency" (p. 2)	"On average, daily paper consumption drops by 15 percent due to the change, and this reduction occurs the very day of the intervention. Put differently, the default determines how one third of all documents will be printed." (p. 3)	
green and clean products			
new technologies			
conservation			
waste treatment			
further aspects			
Alternative Consumption			

waiver, repair, reuse	"defaults typically fail to stick when people have well defined preferences" (p. 5)	
using instead of owning		
individual impact		
waste reduction	The succeeding of the nudge is much likely to imply a reduction of paper waste.	
further aspects		
long-term effects	"the magnitude of the effect does not diminish over time; more than six months after the intervention, consumption is still at the new lower level" (p. 3)	"the printing volume is independent of the default setting" (p. 13) -Rebound effects of the nudge can be excluded in this study.

Title	Green defaults: Information presentation and pro-environmental behaviour		
Author(s)	Pichert, D.; Katsikopoulos, K. V.		
Date	2008		
Country	Germany		
Short Name	green energy default		
Type of Nudge	Default		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	reduction of fossil energy use	increasing the demand for green energy by setting a default on green energy supply	"The idea is that increasing demand for green power will result in fewer conventional fuels and more environmentally benign energy sources being used." (p. 64)
Choice Architect	there are two natural experiments in the study, in experiment A the choice architect is an incumbent regional energy provider that was born out of an initiative against nuclear power and exclusively delivers renewable energy, in experiment B it is an incumbent energy provider that has different tariffs on offer with a default on green energy		
Choice Maker	the citizens of the respective regions (A: Schönau; B: "a grid area in southern Germany" (p. 66))		
Other Actors			
Ecological Modernization			
efficiency			
green and clean products	A: "Nearly every customer remained with the green default." (p. 66); B: "About 94% of the customers remained with the default option." (p. 66)		
new technologies	"a green default means that most people use green electricity" (p. 66)		
conservation			

waste treatment	
further aspects	"Note that buying green electricity does not make a difference in the actual household electricity supply, but rather in investment flows." (p. 64)
Alternative Consumption	
waiver, repair, reuse	
using instead of owning	
waste reduction	
further aspects	
long-term effects	"Generally, although they are free to do so at any time, most people simply do not change the default." (p. 65)

Title	Edinburgh 'Nudging' Success in Recycling		
Author(s)	Gulland, I.		
Date	2015		
Country	Scotland		
Short Name	small bins default		
Type of Nudge	Default		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	promote recycling	the households' waste bins were replaced with smaller ones in order to push people towards recycling	"push up the recycling rate in Scotland towards the 70% target"
Choice Architect	Edinburgh City Council		
Choice Maker	140,000 households	the nudge is supposed to be applied in the whole city	
Other Actors	Zero Waste Scotland Initiative (in favor of the nudge)		
Ecological Modernization			
efficiency			
green and clean products			
new technologies			
conservation			
waste treatment	"recycling rates have shot up by 85% since the introduction of smaller refuse bins in targeted areas"	"these changes all get people thinking harder about what they do with their 'waste'"	
further aspects			

Alternative Consumption	
waiver, repair, reuse	
using instead of owning	
individual impact	
waste reduction	"encouraging people to recycle needs to go hand in hand with some discouragement to waste things" - Stating this, Gulland still implies that the alternative to wasting things is recycling them as the basic message of the article reveals. There is no hint to the idea of reducing waste in the first place.
further aspects	
long-term effects	

Title	Active and Forced Choice for Overcoming Status Quo Bias: A Field Experiment on the Adoption of "No junk mail " Stickers in Berlin, Germany
Author(s)	Liebig, G; Rommel, J.
Date	2014
Country	Germany
Short Name	No Junk Mail Stickers
Type of Nudge	Default, Increase in ease

Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Goal	reduction of waste, resource extraction and CO2 emissions	reduction of primarily paper waste through the attachment of "no junk mail" stickers to mailboxes	"additional benefits for consumers and positive environmental side effects for society as a whole" (p. 425)
Choice Architect	the researchers who conducted the nudge as a field experiment	suggested choice architects for future implementation: landlords	
Choice Maker	1327 households in Berlin	"It aims at reducing status quo bias and improving consumer sovereignty by (1) reducing the effort to reach an active decision and (2) confronting consumers with a forced choice." (p. 427)	
Other Actors			

Ecological Modernization	
efficiency	
green and clean products	
new technologies	"there is even a large savings potential for the advertisement industry via more precise targeting of consumers" (p. 425) - This suggests that the nudge results in a shift to the use of different kinds of ads that continue to demand resources and emit GHGs - albeit less - while they are additionally better targeted

	and have a bigger potential to enhance consumption in general.		
conservation			
waste treatment			
further aspects	The decrease of resource extraction and energy use due to lower production rates is mentioned as a potential benefit, but is not further quantified since it depends on the response of the advertisement industry to the households' rejection of junk mail. It is hence not a primary benefit of the nudge.		
Alternative Consumption			
waiver, repair, reuse	"One survey found that more than 20 million Germans—or more than a quarter of the population—read junk mail only about once a month or less (Ifak Institut 2013)." (p. 425) - By attaching the sticker to their mailbox people renounce the reception of junk mail that most of them do not read anyways.		
using instead of owning			
individual impact			
waste reduction	Measured by the success of the experiment and upscaled to the whole city, the nudge could lead to a paper waste reduction of 7500 tons per year in Berlin (see p. 432).		
further aspects			
long-term effects			
long-term effects	The nudge only needs to initiate one single action in order to have long-term influences.		

Title	Slim by Design: Serving Healthy Foods First in Buffet Lines Improves Overall Meal Selection		
Author(s)	Wansink, B.; Hanks, A. S.		
Date	2013		
Country	United States of America		
Short Name	buffet arrangement		
Type of Nudge	Default		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	fighting obesity	"guiding diners to make healthier selections" (p. 1) by putting the healthy foods first on a buffet	

Choice Architect	the researchers conducting the field experiment	"Serving healthier foods first can be done by any conference hotel, Chinese buffet, catering company, school cafeteria, or even household" (p. 5)	
Choice Maker	124 Human Resource managers at a conference		
Other Actors			
Ecological Modernization			
efficiency			
green and clean products			
new technologies			
conservation			
waste treatment			
further aspects	"Adjusting food arrangements is also a win-win strategy by not only nudging [20] consumers to eat better, but also by promoting healthier foods, helping consumers become slim by design." (p. 5)		
Alternative Consumption			
waiver, repair, reuse	"diners took 31% more items (2.20 to 2.89; p= 0.001) when cheesy eggs were served first" (p. 4) - Serving healthy foods first, in turn nudged people to eat less in total.		
using instead of owning			
individual impact			
waste reduction			
further aspects			
long-term effects			

Title	Partitioned Shopping Carts: Assortment Allocation Cues That Increase Fruit and Vegetable Purchases		
Author(s)	Wansink, B.; Soman, D.; Herbst, K. C.; Payne, C. R.		
Date	2014		
Country	United States of America; Canada		
Short Name	partitioned shopping carts		
Type of Nudge	social norms, increase in ease		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	

Expressed Sustainability Goal	"helping to curtail obesity by changing which foods are purchased" (p. 29)	the partitioning of shopping carts into parts for healthy foods and parts for everything else is supposed to influence shoppers' purchasing behavior	
Choice Architect	researchers conducting the studies	In the future "[p]artitioned shopping carts could be championed" (p. 4) by public policy officials	"Well-intentioned marketers may be suited to help lead the movement effectively toward behavioral change." (p. 32)
Choice Maker	grocery shoppers		
Other Actors	Supermarkets as the place of trial		
Ecological Modernization			
efficiency			
green and clean products	"A retailer could just as easily use partitioning to suggest another categorization scheme, such as natural foods versus processed foods." (p. 27)		
new technologies			
conservation			
waste treatment			
further aspects	"By denoting that fruits and vegetables should be placed in the front part of the cart, the aggregate percentage of these items increased by 121.8% (\$3.99 to \$8.85)." (p. 13)	"Healthy perishable foods are profitable ones for grocery stores to sell." (p. 26)	
Alternative Consumption			
waiver, repair, reuse	"It may not only increase the amount of healthy foods purchased, but it may also decrease the amount of less healthy foods purchased. In such a case, social norms would become purchase norms." (p. 6)		
using instead of owning			
individual impact			
waste reduction			
further aspects	"Improving the food purchase decisions made in grocery stores [...] would show consumers that small changes can have big effects, and it might lead to positive changes in other parts of their life." (p. 26)		
long-term effects			

Title	The Influence of Descriptive Social Norm Information on Sustainable Transportation Behavior: A Field Experiment
Author(s)	Kormos, C.; Gifford, R.; Brown, E.
Date	2014
Country	Canada
Short Name	sustainable transportation norms

Type of Nudge	social norms, reminders, precommitment strategies		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	"contribute to an overall reduction in GHG emissions"(p. 2)	using descriptive social norm information to "reduce personal vehicle use" (p. 2)	
Choice Architect	researchers conducting the study	"practitioners who design and implement sustainable transportation social norm campaigns"	
Choice Maker	study participants from a Canadian University		
Other Actors			
Ecological Modernization			
efficiency	"options for sustainable commuting (i.e., for public transportation, cycling, ridesharing, or carpooling)" (p. 7) - Despite for cycling, these options mainly represent matters of increased efficiency as there are more people being transported with one vehicle. The fact that the focus lies on reducing <i>private</i> or <i>personal</i> vehicle use shows that motorized transportation in general is not of concern.		
green and clean products			
new technologies			
conservation			
waste treatment			
further aspects	"the overall effect of social norm condition on change to total transportation behavior across the study was non-significant. There was, however, a significant linear trend, $F(1, 72) = 4.37, p = .04$, indicating that as the presentation of descriptive social norm information increased, from nonexistent to low to high, the amount of total sustainable transportation use relative to private vehicle use increased proportionately." (p. 13)		
Alternative Consumption			
Waiver, repair, reuse	Waiver is present in the reduction of personal vehicle use.		
using instead of owning	Ridesharing and carpooling as alternatives to private car use fall into this category.		
individual impact			
waste reduction			
further aspects	"normative interventions can perhaps help <i>unfreeze</i> private vehicle use commuting habits by encouraging commuters to consciously evaluate their travel mode choices and to subsequently establish new, more sustainable, habits" (p. 19, italics in original)		
long-term effects	"Future research could examine the durability of the observed effect of the social norm information on behavior change by including a longer time frame." (p. 17)		

Title	The Persistent Impacts of Norm-Based Messaging and Their Implications for Water Conservation		
Author(s)	Bernedo, M.; Ferraro, P. J.; Price, M.		
Date	2014		
Country	United States of America		
Short Name	water use norms		
Type of Nudge	social norms, disclosure		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	"to promote conservation efforts during a period of extreme drought" (p.439)	"influence longer-run patterns of residential water use" (p. 438) through the elicitation of other residents' water use	
Choice Architect	Cobb County Water Conservation Coordinator	"For policymakers, these results are promising and suggest a potentially important role for behavioral nudges in environmental policy—they provide a low cost way to reduce residential consumption levels."	
Choice Maker	residents of Cobb County		
Other Actors	water utilities		
Ecological Modernization			
efficiency			
green and clean products			
new technologies	"the treatment effects arise through the creation of new habits or the adoption of mobile technologies " (p. 439; highlights added)		
conservation	Conservation is the whole point of the nudge as the title of the study already reveals.		
waste treatment			
further aspects	"a structural reduction in demand may force [the water utilities] to raise prices" (p. 448)		
Alternative Consumption			
waiver	"the appeal to pro-social preferences and the appeal augmented with a social comparison reduced water use by 2.7% and 4.8%, respectively, relative to the control group" (p. 439)	"the treatment effects arise through the creation of new habits or the adoption of mobile technologies" (p. 439; highlights added)	
repair or reuse			
using instead of owning			
individual impact			
waste reduction			
further aspects			

long-term effects	"While the estimated effect size declines by nearly 50% after 1 year, we find that it remains detectable and policy-relevant 4 years later." (p. 439)	"the treatment effect disappears when the treated customers disappear" (p. 439)	"persistence in the treatment effects from normative messaging that includes social comparisons reflects habit formation" (p. 445)
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Title	Healthy convenience: nudging students toward healthier choices in the lunchroom
Author(s)	Hanks, A.; Just, D. R.; Smith, L. E.; Wansink, B.
Date	2012
Country	United States of America
Short Name	healthy convenience
Type of Nudge	increase in ease and convenience

Political Ecology and Power Structures

	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	fighting childhood obesity	"lead individuals to select and eat healthier foods" (p. 2) by setting up a convenience line for healthy food in a school lunchroom	
Choice Architect	researchers in cooperation with lunchroom staff	"cafeterias in hospitals, office buildings and in other locations can also promote healthy choices with this simple conversion" (p. 6)	
Choice Maker	school children		
Other Actors			

Ecological Modernization

efficiency	
green and clean products	
new technologies	
conservation	
waste treatment	
further aspects	

Alternative Consumption

waiver, repair, reuse	"we find that consumption of less healthy foods decreases by 27.9%, so even though students are not eating additional healthy items, they are at least eating fewer less healthy foods" (p. 5)
using instead of owning	
individual impact	
waste reduction	

further aspects	
long-term effects	"Although the childhood obesity problem cannot be solved with a convenience line in school cafeterias, it is a low-cost way to encourage healthy choices in schools and promote life-long habits, which can help in the battle." (p. 2)

Title	Nudge to nobesity II: Menu positions influence food orders
Author(s)	Dayan, E.; Bar-Hillel, M.
Date	2011
Country	Israel
Short Name	menu positions
Type of Nudge	increase in ease

Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	fighting obesity	encouraging healthier food choices by listing the healthy dishes in popular positions throughout restaurant menus
Choice Architect	researchers in cooperation with café owners	any restaurant could arrange its menu according to its selling agenda
Choice Maker	restaurant guests	
Other Actors		

Ecological Modernization	
efficiency	
green and clean products	
new technologies	
conservation	
waste treatment	
further aspects	"Nudges can be used not only to promote healthier food choices, but any other agenda as well (higher earnings; faster turnover for more perishable foods; etc.). It is up to us to nudge to nobesity." (p. 340)

Alternative Consumption	
waiver, repair, reuse	Consumption is only redirected through the nudge.
using instead of owning	
individual impact	
waste reduction	
further aspects	
long-term effects	"even negligibly small effects can accumulate over time till they are significant" (p. 340)

Title	Relish Smartwire: The future of domestic wiring...		
Author(s)	Relish		
Date	2014		
Country	United Kingdom		
Short Name	power down switch		
Type of Nudge	increase in ease, (disclosure)		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	"contributes not only to the affordable warmth agenda but also to carbon emissions reduction" (p. 2)	reduction of electricity consumption through the installation of Smartwire in houses that enable an easy power down switch	
Choice Architect	Worthing Homes (social business providing rented homes)	a policy measure is suggested in terms of Building Regulation: "making [Smartwire] mandatory in new builds, when undertaking notifiable works" (p. 10)	
Choice Maker	residents participating in the Smartwire pilot		
Other Actors	Homes and Community Agency and a Member of Parliament as official supporters		
Ecological Modernization			
efficiency	"We create energy efficient homes and tools to help residents optimise their chances of reducing their energy use." (p. 8)		
green and clean products			
new technologies	"technological advances will ensure that the next generation of Smartwire is simpler, more adaptable and cheaper" (p. 10)		
conservation			
waste treatment			
further aspects	"Relish Smartwire is a demonstration of both innovation and stakeholder engagement." (p. 8)		
Alternative Consumption			
waiver, repair, reuse	"raising awareness, continuing to influence and promoting the benefits of changing our habits"		
using instead of owning			
individual impact			
waste reduction			
further aspects			

long-term effects	"Relish Smartwire is about behaviour change, which does not happen overnight. We often describe this initiative as having similar challenges to that of early recycling campaigns. Once people 'get it', it becomes second nature." (p. 9)
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Title	Measuring the impact of opening the London shared bicycle scheme to casual users
Author(s)	Lathia, N.; Ahmed, S.; Capra, L.
Date	2012
Country	United Kingdom
Short Name	open bicycle scheme
Type of Nudge	increase in ease

Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	"lead cities away from the congestion and pollution problems" (p. 88)	enhancing the use of a shared bicycle scheme by opening it for casual users instead of keeping restricted to members
Choice Architect	London's public transport authority	"A key facet of building successful shared bicycle system, and, more broadly, any urban public transport system, is understanding how designed system characteristics, implemented as policies, affect usage." (p. 88)
Choice Maker	London's potential bike riders in possession of a credit or debit card	
Other Actors		

Ecological Modernization	
efficiency	
green and clean products	
new technologies	"There exists a growing number of smartphone applications and online maps that aim to help travellers both find and return bicycles; [...] accurate real-time monitoring of stations' state, coupled with adaptive forecasting across (un)planned usage pattern changes, may attract more users to the system." (p. 101)
conservation	
waste treatment	
further aspects	

Alternative Consumption	
waiver, repair, reuse	"the shift actually encourages usage of the system for non-casual trips" (p. 89) - The result that the system's use for commuting purposes has apparently increased might hint towards a shift from motorized transportation to cycling.
using instead of owning	Bike hire systems like the one in London represent a way through which people are enabled to shift from owning to just using. However, it is not explored here, to what extent the system influences bike ownership among its users.
individual impact	

waste reduction	
further aspects	
long-term effects	

Title	Effectiveness of a web-based intervention to encourage carpooling to work: A case study of Wellington, New Zealand
Author(s)	Abrahamse, W.; Keall, M.
Date	2012
Country	New Zealand
Short Name	carpooling platform
Type of Nudge	disclosure, increase in ease

Political Ecology and Power Structures

	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	improvement of environmental quality	"reducing the frequency of solo driving" (p. 47) through facilitating carpooling and informing about its benefits via a carpooling platform	"car travel contributes to a variety of problems related to environmental quality and public health, such as congestion, airpollution, peakoil, and climate change" (p. 45)
Choice Architect	Greater Wellington Regional Council		
Choice Maker	registrants at the platform of the Let's Carpool initiative		
Other Actors			

Ecological Modernization

efficiency	"The percentage of participants who carpoled to work [...] increased from 12.4% to 27.9%." (p. 48) - This result alone does not show whether the total number of cars could be reduced and is therefore only an indicator for increased efficiency. Carpooling offers a way to keep using the car - just more efficiently.		
green and clean products			
new technologies			
conservation			
waste treatment			
further aspects	"the use of public transport was also replaced by carpooling to some extent" (p. 50)		

Alternative Consumption

waiver, repair, reuse	"The percentage of commuters who walked, ran, or cycled to work increased slightly [...]." (p. 48) - This might also be due to the disclosure, but remains unclear.		
using instead of owning	"There was a significant decrease in the frequency of driving alone to work from 36.6% to 29.9% [...]." (p. 48)		

individual impact	
waste reduction	
further aspects	
long-term effects	

Title	IS A RESIDENTIAL RELOCATION A GOOD OPPORTUNITY TO CHANGE PEOPLE'S TRAVEL BEHAVIOR? Results From a Theory-Driven Intervention Study		
Author(s)	Bamberg, S.		
Date	2006		
Country	Germany		
Short Name	public transport intervention		
Type of Nudge	increase in ease		
Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	lessen the "negative effects [of car traffic] on the environment such as air pollution, noise, and permanent congestion" (p. 820)	"reduce car use for daily trips in an urban area" through "personally tailored information on how to use PT for daily trips, combined with a small financial incentive (1-day free ticket)" (p. 834)	
Choice Architect	Stuttgart's public transportation company in cooperation with the researchers		
Choice Maker	people moving to Stuttgart		
Other Actors			
Ecological Modernization			
efficiency	"In the experimental group, [public transport] use increased drastically from 18% to 47%" (P. 828)		
green and clean products			
(new) technologies			
conservation			
waste treatment			
further aspects			
Alternative Consumption			
waiver, repair, reuse	"In the experimental group, the decline of car use is also stronger (from 50% to 33%) than in the control group (from 50% to 45%)" (p. 828)		
using instead of owning			
individual impact			
waste reduction			

further aspects	"the observed strong behavioral change is best understood as an interplay among the intervention itself and a network of additional change-facilitating mechanisms triggered by the move" (p. 837)	"the intervention may have played a crucial role as the last push that sets the readiness for behavioral change" (p. 837)
long-term effects	"I am a little skeptical about how sustainable the drastic behavioral change was and expect that a later measurement would have shown a reincrease in car use." (p. 838)	

Title	Wie viel Heizenergie sparen MieterInnen, die ein Energiesparkonto nutzen?	
Author(s)	Hengstenberg, J. D.	
Date	2014	
Country	Germany	
Short Name	energy saving accounts	
Type of Nudge	disclosure, social norms	
Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	reduction of used heating energy	nudging households to take measures in order to reduce their heating energy consumption by visualizing their consumption and comparing it to other users via an online heating energy-saving account
Choice Architect	co2online, a German non-profit organization engaged in climate protection	co2online consults the German government on the basis of their findings to introduce a regulation for landlords and landlords to inform their tenants about their heating energy consumption in relation to their living area
Choice Maker	users of heating energy-saving accounts	in case the suggested regulation is introduced, the choice makers consist of all tenants in Germany
Other Actors	the German government and the EU as funders of co2online	
Ecological Modernization		
efficiency		
green and clean products		
new technologies	"Einsparererfolge [...] durch geringinvestive Maßnahmen zur Minderung des Heizenergieverbrauchs in der Wohnung: Erneuerung der Thermostatkappen, Nutzung zeitgesteuerter elektronischer Thermostate oder Nutzung von Hausautomationssystemen" (p. 1) - Success in energy saving can inter alia be generated through small investments in metering and control equipment.	
conservation		
waste treatment		
further aspects		

Alternative Consumption	
waiver, repair, reuse	"Einsparerefolge, die Mieterhaushalte „jenseits“ der wärmetechnischen Ertüchtigung des Gebäudes erzielen, also durch einen bewussteren Umgang mit Energie" (p. 1) - Success in energy saving can inter alia be generated through a more conscious treatment of energy.
using instead of owning	
individual impact	The nudge presents a way how the individual environmental impact can be illustrated.
waste reduction	
further aspects	
long-term effects	"Insgesamt ist die Einsparung an Energie durch Einsparmaßnahmen in der Wohnung im Laufe von 7 Jahren beträchtlich: Sie beträgt fast ein Viertel"; "Vielmehr ist anzunehmen, dass irgendwann eine Sättigung eintritt, wenn alle Maßnahmen zum Energiesparen in der Wohnung ausgeschöpft wurden." (p. 4) - The energy saving potential accounts for almost a quarter over a period of seven years during which households use the online platform, subsequently saturation is expected.

Title	Evaluation of the DECC/John Lewis energy labelling trial
Author(s)	Department of Energy and Climate Change (DECC)
Date	2014
Country	United Kingdom
Short Name	energy labelling
Type of Nudge	Disclosure

Political Ecology and Power Structures			
	General Information	Further Information (quotes, details, future implementation)	
Expressed Sustainability Goal	reduction of energy consumption and therefore less GHG emissions and better air quality	promoting the purchase of energy efficient appliances through the disclosure of their lifetime energy costs	"an overall decrease in energy use through the purchase of more energy efficient appliances" (p. 11)
Choice Architect	Department of Energy and Climate Change of the UK government		
Choice Maker	customers of John Lewis stores		
Other Actors	The Behavioural Insights Team (as designer of the nudge and conductor of the analysis); John Lewis (as the place of trial and potential future implementer)		

Ecological Modernization	
efficiency	"Energy labelling reduced the average annual energy consumption of washer dryers by 6.64 kWh (0.7 per cent) [...] No significant effect was found for the other product types" (p. 20)
green and clean products	
new technologies	
conservation	

waste treatment	
further aspects	"society is estimated to benefit by around £48,000 in avoided emissions, reduced energy supply costs and subsequent air quality benefits" (p. 27) - The fact that the avoided GHG emissions and air quality improvement is expressed in financial terms gives insights on the focus of the nudge or at least of the analysis.
Alternative Consumption	
waiver, repair or reuse	"Energy efficiency advice/signposting to lifetime running costs may be even more important when consumers are thinking about purchasing a more efficient machine that's bigger than their old one as it may not use any less energy at all, if it isn't used effectively." (p. 36) - This is just a side note in the report which was not incorporated in the trial, but is suggested to be taken into account for the design of further measures.
using instead of owning	
individual impact	
waste reduction	
further aspects	"There was a perception from Partners that customers had become a lot more aware of energy generally." (p. 30)
long-term effects	"the effect was independent of time and was sustained over the trial period" (p. 27)

Title	Reducing family car-use by providing travel advice or requesting behavioral plans: An experimental analysis of travel feedback programs	
Author(s)	Fujii, A.; Taniguchi, A.	
Date	2005	
Country	Japan	
Short Name	travel feedback program	
Type of Nudge	precommitment strategies, information on consequences/ feedback	
Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	"ease traffic congestion in urban areas and to reduce environmental problems resulting from automobile emissions" (p. 385)	see title
Choice Architect	researchers conducting a field experiment	"The results are used to discuss the psychological process of behavioral modification, theoretically effective interventions, and policy implications for implementing effective travel feedback programs." (p. 385)
Choice Maker	"students at an elementary school, and their families" (p. 387)	
Other Actors	the school as the place of trial and potential future implementer	
Ecological Modernization		

efficiency	
green and clean products	
new technologies	
conservation	
waste treatment	
further aspects	
Alternative Consumption	
waiver, repair, reuse	"The actual reduction was estimated to be 27.7% in terms of total trip duration, and 11.6% in terms of car-use days." (p. 391) - This refers to the planning group in the experiment.
using instead of owning	
individual impact	"feedback information is provided, including information on the CO2 emissions their car produced" (p. 386) - This refers to only one of the two experimental groups, namely the advice group, and not the planning group.
waste reduction	
further aspects	
long-term effects	

Title	Smart metering in Germany and Austria: Results of providing feedback information in a field trial	
Author(s)	Schleich, J.; Klobasa, M.; Brunner, M.; Gözl, S.; Götz, K.	
Date	2011	
Country	Germany and Austria	
Short Name	energy consumption feedback	
Type of Nudge	information on consequences/ feedback	
Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	"overcome information-related barriers and lead to lower energy use" (p. 1)	feedback on energy consumption enabled by smart meters is supposed to reduce the households' energy consumption
Choice Architect	Intelliekon project, conducted by several German research institutes and funded by the Federal Ministry of Education and Research	
Choice Maker	households in one Austrian and seven German municipalities	
Other Actors	energy utilities, metering point operators, measuring service providers	
Ecological Modernization		
efficiency	"higher marginal costs for electricity consumption during peak periods compared to off-peak periods are expected to shift consumption to off-peak periods" (p. 1)	

green and clean products	
new technologies	"regulation on smart metering may create markets and marketing opportunities for [Metering Point Operators] and utilities and lead to a range of new products and services" (p. 2)
conservation	
waste treatment	
further aspects	
Alternative Consumption	
waiver, repair, reuse	"Several components have been introduced to increase the motivation for and practical knowledge of energy saving measures." (p. 5)
using instead of owning	
individual impact	
waste reduction	
further aspects	
long-term effects	"future research could take into account that the impact of feedback effects may change over time. On the one hand, feedback effects could be short-lived because household behaviour returns to longterm habits after a certain time. [...] On the other hand, if information feedback results in a permanent change in habits, these effects could have a long-term impact on energy use" (p. 13)

Title	Self-powered Water Meter for Direct Feedback	
Author(s)	Tasic, V.; Staake, T.; Stiefmeier, T.; Tiefenbeck, V.; Fleisch, E.; Tröster, G.	
Date	2012	
Country	Switzerland	
Short Name	smart water meters	
Type of Nudge	information on consequences/ feedback	
Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	reduce energy use and CO2 emissions	"inform individuals in a timely way about their energy usage" stemming from hot water usage in showers
Choice Architect	researchers conducting a trial	
Choice Maker	91 Swiss households	
Other Actors	the company that developed the metering system (with assumably big interest in the success of the trial)	
Ecological Modernization		
efficiency		
green and clean products	"the display of future smart water meters will be also powered by the microgenerator, which completely removes the need for batteries" (p. 6)	

new technologies	"Our novel approach turns regular faucets into smart objects with the ability to communicate to direct feedback "providers" (in-shower displays, in-home displays, web portals, smart phones, etc.)." (p. 6)	
conservation		
waste treatment		
further aspects		
Alternative Consumption		
waiver, repair, reuse	"users significantly reduced their average water consumption for showering per day and per household (-22%). Likewise, heat energy usage for hot water also declined by 0.6kWh/day per household." (p. 2)	"Projected to one year, the average household could conserve 6,400 liters of drinking water and 210 kWh of heat energy." (p. 6)
using instead of owning		
individual impact		
waste reduction		
further aspects	"In a fictive scenario where each European household would have such a smart water meter with direct feedback, the energy savings would add up to around 42TWh (projected to one year). This amount of saved energy equals to the yearly production of ten modern coal power plants (600MW) which would emit 33 millions of tons of CO2." (p. 6)	
long-term effects	"the savings effects remained stable during the course of study, with very slight tendency to decay" (p. 6)	"Critics of consumption feedback claim that the effects of feedback intervention decay over time. On the other hand, proponents of feedback technologies state that feedback interventions, if designed in a proper way, can turn desired behaviors into a habit that is stable over time." (p. 1)

Title	Providing eco-driving feedback to corporate car drivers: what impact does a smartphone application have on their fuel efficiency?	
Author(s)	Tulusan, J.; Staake, T.; Fleisch, E.	
Date	2012	
Country	Switzerland	
Short Name	eco-driving app	
Type of Nudge	information on consequences/ feedback	
Political Ecology and Power Structures		
	General Information	Further Information (quotes, details, future implementation)
Expressed Sustainability Goal	"stimulate changes in driving in favor of both, reduced costs and environmental impact" through "eco-driving feedback technologies", aka a smartphone application (p. 1)	
Choice Architect	researchers conducting the study	further implementation is suggested to corporations with a large car fleet
Choice Maker	50 Swiss corporate car drivers as study participants	

Other Actors	DriveGain (the provider of the tested app)	
Ecological Modernization		
efficiency	"Eco-driving presents an economical approach to reducing fuel consumption" (p. 1)	"potential savings for companies with a large car fleet could be immense if drivers improved their fuel efficiency by adapting a more sustainable driving style" (p. 1)
green and clean products		
new technologies	"The improvement in fuel efficiency demonstrates that ubiquitous computing technologies can play an important role in reducing a company's overall CO2 emission and petrol costs." (p. 4)	
conservation		
waste treatment		
further aspects		
Alternative Consumption		
waiver, repair, reuse		
using instead of owning		
individual impact		
waste reduction		
further aspects		
long-term effects	"it would be of interest to evaluate how the usage of the eco-driving smartphone application changes over time, and if there is a correlation between frequency of usage and overall improvement in fuel efficiency" (p. 4)	