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Environmental Citizenship and Electric Vehicles

A Case Study of Norway and Denmark

Bjørn Hvidtfeldt Larsen

Abstract

This thesis focuses on the sale of electric vehicles (EVs) in Denmark and Norway in an attempt to gain insights into what stimulates and maintains pro-environmental behaviour. Norway stands out as an exceptional case with a significantly better market-share of EVs than anywhere else in the world. In an attempt to shed more light on what causes these results, the study applies the theoretical framework of environmental citizenship and specifically investigates to what extent behaviour towards EVs is driven by pro-environmental attitudes or fiscal incentives. The analysis is based on surveys and sales data. The study concludes that attitudes play less of a role in generating long-term behavioural change towards EVs than previous studies have otherwise shown regarding other forms of pro-environmental behaviour. Fiscal incentives prove central to promote further progress. The conclusions leave room for new context-driven theoretical discussions of what causes pro-environmental behaviour.

Key words: Electric vehicles, environmental citizenship, behavioural change, pro-environmental behaviour, attitudes, fiscal incentives

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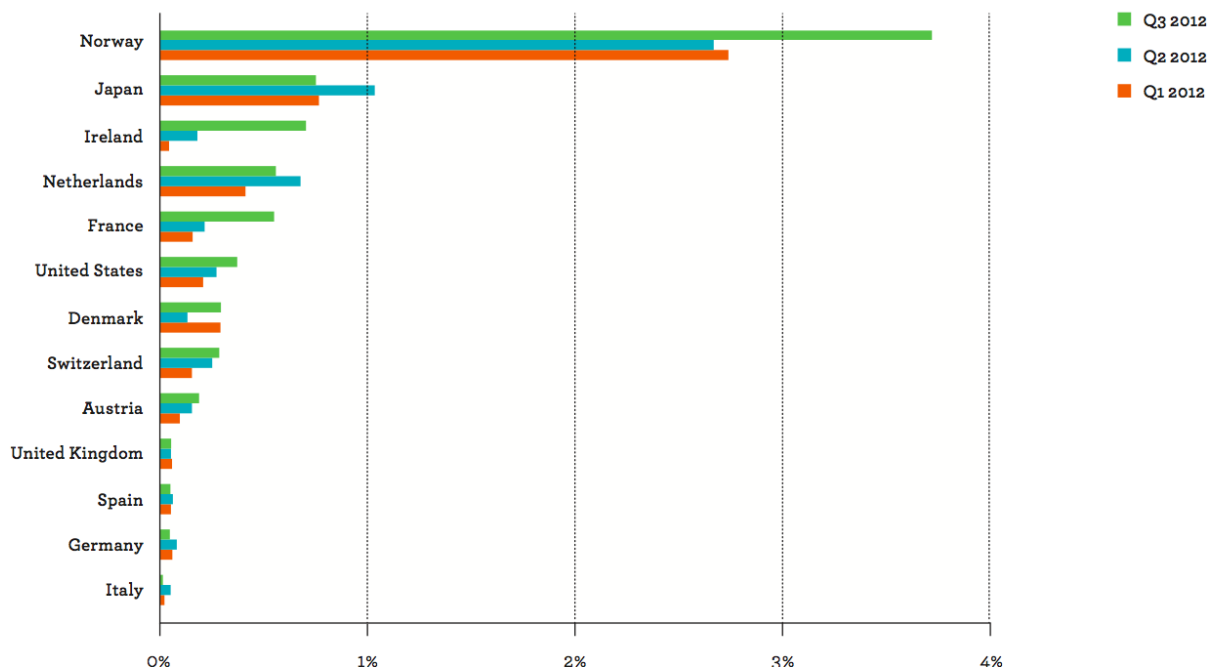
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1. Introduction

In an attempt to mitigate the risk of climate change and minimise the dependency of petroleum, nation-states around the world have attempted to push electric vehicles (EVs) onto the market to various results within recent years (EVI and IEA, 2013). Globally, similar explanations have been used to describe the limited results so far, primarily focusing on range, price and the general appeal of the product (Christensen et al., 2013). However, the Norwegian case stands out. When looking at the global EV-market, Norway has experienced a growing market-share of EVs that by far exceed any other country within recent years (see figure 1).

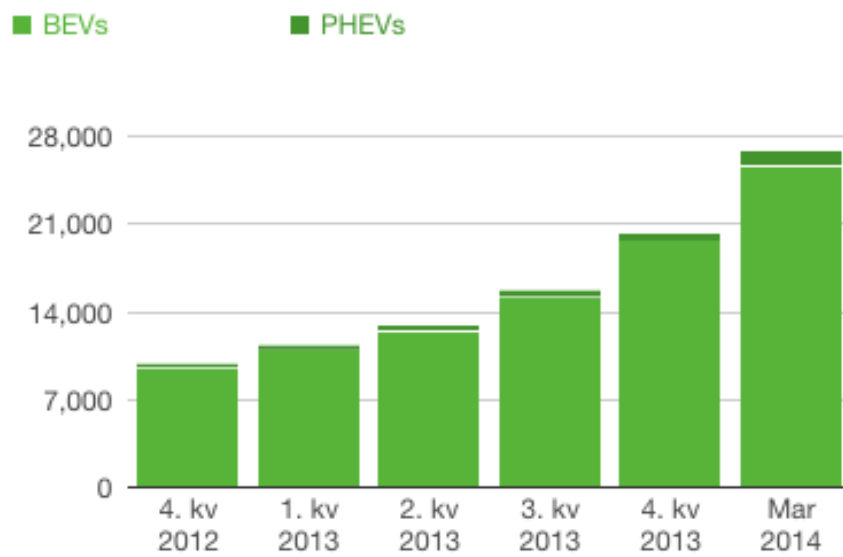
Figure 1: EV Uptake Comparison, Q1-Q3 2012



(EVI and IEA, 2013)

And the Norwegian results are growing. Within recent months and years, the amount of registered EVs in Norway has grown exponentially as figure 2 exemplifies.

Figure 2: Total amount of registered EVs in Norway



(Gronnbil.no, 2014b)

In an otherwise comparable country such as Denmark (the selection of cases will be addressed in chapter 2), the development appears stagnant with only a smaller change in behaviour. In 2013 only 650 EVs were sold equalling just 0,3 pct. of the total car sales in Denmark (ENERGIWATCH, 2014). In contrast, Norway experienced 10.769 new EV sales in 2013 equalling 5,6 pct. of the total sales (Gronnbil.no, 2014c).

Theoretical Perspective

The cases of Denmark and Norway are interesting in an attempt to understand pro-environmental behaviour. Throughout years, behavioural change has been a subject of analysis for sociological, psychological, and economical studies. Within recent years however, there has been a growing focus on how to specifically understand and

generate *pro-environmental* behaviour (Bell and Dobson, 2006, Dobson, 2010, Jagers et al., 2014). The theory of environmental citizenship is particularly interesting because it differentiates pro-environmental behaviour from other types of behaviour in an attempt to explain how and why pro-environmental behaviour occurs. Andrew Dobson, one of the main theoretical contributors, argues that pro-environmental behaviour is most successfully generated when citizens share values and ideals of environmental citizenship. As a result, pro-environmental behaviour is best stimulated through arguments of morale and common justice (see chapter 2). Fiscal incentives have a short-term positive effect on behavioural change, but various case studies have shown that fiscal incentives leads to a long-term negative impact on attitudes, as citizens fail to understand the underlying rationale behind the incentives. According to environmental citizenship, in order to generate long-term pro-environmental behaviour, the focus should instead be on changing citizens' attitudes (Dobson, 2009, Dobson, 2010, Jagers et al., 2014).

Research Contribution and Research Question

The theory of environmental citizenship is still relatively new and continuously being developed (see Jagers et al. for recent studies in Sweden). Previous research have primarily focused on inexpensive behavioural practices such as recycling and congestion (Dobson, 2009, Dobson, 2010), which makes EVs a particularly interesting study to add. Besides introducing environmental citizenship to new territories, the study of EVs differs from previous research, as the purchase of cars represents a significant investment and relates to citizens' mobility (see chapter 7). Combining these aspects allow for potentially new insights into what creates pro-environmental behaviour in a growing theoretical field.

Based on the presented theoretical perspective, this thesis wishes to contribute to the discussions of what stimulates pro-environmental behaviour. The analysis will test and challenge environmental citizenship and its embedded understanding of the

relationship between attitudes and fiscal incentives to see how applicable the theory is in the context of EVs in Denmark and Norway. This leads to the following research question:

To what extent are pro-environmental attitudes and fiscal incentives capable of generating behavioural change towards electric vehicles (EVs)?

The analysis will be based on a comparative study of Norway and Denmark.

The Argument

Based on the analysis of surveys and official data, the study challenges the theoretical framework of environmental citizenship. The data shows that both Denmark and Norway have experienced growth in the number of registered EVs since 2010 (see chapter 4). But where Denmark's growth is linear, Norway's growth appears exponential. Through a comparison of the implemented fiscal incentives (see chapter 5), it is evident that the Norwegian government has introduced more economic (as well as non-economic) incentives, which have significantly reduced the price of EVs in a comparison with Danish incentives. In an international comparison, Norway's incentives are listed as 'top incentives' whereas Denmark's incentives are categorised 'below average'. According to environmental citizenship, these results should result in a negative impact on attitudes (see chapter 2). However, the analysis of citizens' attitudes did not demonstrate as direct consequences to attitudes and long-term behaviour as the theory would otherwise argue. Although citizens in Norway use fewer environmental arguments for purchasing EVs in a comparison of surveys, the results are likely a result of the exact lack of external incentives in Denmark (see chapter 6).

The analysis concludes that there is an insufficient basis for saying that fiscal incentives have resulted in a negative impact on citizens' pro-environmental attitudes regarding EVs. Furthermore, long-term behavioural change appears unlikely without

the use of fiscal incentives based on the limited results in Denmark. The conclusions challenge the theoretical framework of environmental citizenship, as the theoretical causal relationship of fiscal incentives and attitudes could not be relocated within the context of EVs, while both short-term and long-term behavioural change seem tied to the implementation of fiscal incentives. The results call for further theoretical discussions of what causes and maintains pro-environmental behaviour while taking the context of the specific type of behaviour into account.

Concept clarification: EVs

When discussing EVs it is necessary to add that many technical differentiations exist. Throughout this paper, I will primarily focus on Battery Electric Vehicles (BEVs). This means I will not be discussing other kinds of hybrid versions or alternative types of helium or gas-driven automobiles. Although all of these types of vehicles are relevant in a discussion of what generates pro-environmental behaviour in the transportation system, it would make the analysis too complex to include various types of cars as regulation, incentives and availability of technology differ within each country.

Overview of the Paper

In order to discuss the posed research question, the following chapter will outline the theoretical understanding of what creates sustainable behaviour. The discussions will lead to testable theoretical hypotheses, which will form the basis of analysis. Chapter 3 will build on the theoretical framework and discuss how to operationalize, categorise and measure the introduced variables and concepts, while discussing the use of secondary data in the form of surveys and statistics. The analysis will begin in chapter 4 with an examination of to which extent behavioural change has occurred within Denmark and Norway. Chapter 5 will examine and compare the implemented fiscal incentives. Chapter 6 will use surveys to discuss citizens' attitudes and how they relate to the articulated motivations and the fiscal incentives. Chapter 7 will discuss the

technical feasibility of EVs by discussing technical constraints such as charging and range. The chapter will also introduce the theoretical concept of *automobility*. The results of the analyses will be discussed and compared in chapter 8 and summed up in the following conclusion.

2. Theories of Attitudes and Behaviour

In order to explain what created the momentum towards EVs in Norway, the following chapter will introduce environmental citizenship to form the theoretical starting point for the analysis. In doing so, I will introduce four theoretical concepts, which also serve as the analytical variables in my research: *Pro-environmental behaviour*, *attitudes*, *fiscal incentives* and *technical feasibility*. At the end of this chapter, these concepts will be used to form three overall hypotheses, which will drive the analysis going forward.

Understanding Pro-Environmental Behaviour

To facilitate my discussions around what causes pro-environmental behaviour, my theoretical starting point is environmental citizenship, which is a well discussed and acknowledged framework within recent years (Dobson, 2003, Dobson, 2007, Jagers et al., 2012, Jagers et al., 2011, Jagers et al., 2014, Paterson, 2009, Adger and Jordan, 2009, Bell and Dobson, 2006). One of the main theorists within environmental citizenship is Andrew Dobson. He primarily focuses on developing and testing the existence of environmental citizenship (Dobson, 2003, Dobson, 2007, Dobson, 2009, Dobson, 2010). Dobson's analyses are based on comparisons of legislative approaches to stimulate pro-environmental behaviour. In one study, he particularly discusses and compares road pricing with fiscal measures to dissuade citizens' from the overuse of plastic bags and rubbish taxation in England and Ireland (Dobson, 2009). For this analysis, I will use and operationalize his claim for causality between pro-environmental behaviour, attitudes and fiscal incentives in order to test whether the same causation can be relocated in the case of EVs in Denmark and Norway.

Employing this theoretical framework implies that driving EVs could be seen as a pro-environmental behaviour. This is a notion that could be challenged, as many

alternative, environmentally friendly forms of transportation exist and are being promoted. The important thing is however not my subjective opinion on pro-environmental behaviour but what citizens themselves think they are performing. As the survey results show in chapter 6 both citizens from Denmark and Norway have a positive view on the environmental benefits of EVs. This validates the use of environmental citizenship as people view driving EVs as an environmentally friendly action.

Environmental Citizenship

To clarify potential conceptual misunderstandings, I will first briefly mention why I use the concept of *environmental* citizenship and not other used terms such as *ecological* citizenship. In his newest research Dobson uses both the concepts of environmental citizenship and ecological citizenship almost interchangeably, but it is worth noting the original difference. The citizenship types originate from different traditions. Environmental citizenship refers to liberal citizenship, meaning it deals with environmental rights, is territorially bound and is conducted purely within the nation-state. Ecological citizenship on the other hand refers to a post-cosmopolitan citizenship that inhabits both the public and private sphere, works with the language of virtue and is explicitly non-territorial (Dobson, 2003). I mention this distinction not to create confusion, but I will refrain from revisiting this debate going forward, as it serves little purpose for this analysis. Dobson clearly distinguishes between environmental and ecological citizenship in his earlier writings (Dobson, 2007, Dobson, 2003), but later on uses environmental citizenship interchangeably with ecological citizenship (Dobson, 2009, Dobson, 2010). In his most recent work he even uses the term *sustainability* citizenship to cover the same content (Dobson, 2011). In the following discussions, I will be focusing on and using the term *environmental citizenship*, as this is the latest developed concept within my main theoretical sources.

Although different approaches and definitions exist, Dobson (2010) uses the following six characteristics, which I have borrowed from his book, as a fundament of the environmental citizenship. The environmental citizen:

1. **Believes that environmental sustainability is a common good** that will not be achieved by the pursuit of individual self-interest alone. Lying behind this belief is an understanding of the environment as a common-pool resource: no one can be effectively excluded from it, but it is finite and diminishing.
2. **Is moved by other-regarding motivations** as well as self-interested ones. That is, the environmental citizen will seek to maintain the integrity of the common-pool resource because of its public benefit, rather than some private, individual, excludable benefit. The environmental citizen says, ‘I will even if you won’t’.
3. Believes that ethical and moral knowledge is as important as techno-scientific knowledge in the context of pro-environmental behaviour change.
4. **Believes that other people’s environmental rights engender environmental responsibilities**, which the environmental citizen should redeem. In contrast to other forms of citizenship, the relationship between rights and duties in environmental citizenship is less about the rights and duties of citizens vis-à-vis the government, and more about the rights and duties of citizens vis-à-vis each other.
5. **Believes that these responsibilities are due not only to one’s neighbours or fellow nationals but also to distant strangers** (distant in space and even in time). It is well known that environmental problems transcend national boundaries, so any citizenship that speaks only the language of the nation-state territoriality will be a poor fit with the extra-territoriality that environmental citizenship appears to demand.
6. **Is aware that private environment-related actions can have public environment-related impacts.** This differs from traditional understandings of

citizenship in also regarding practices that take place in the private arena – such as recycling – as ‘citizenly’.

(Dobson, 2010)

Building on these characteristics, it becomes evident that social justice as a sense of fairness is at the core of environmental citizenship. It represents a global awareness that transcends national borders and time, and goes beyond motives of personal interest and gain (Dobson, 2010, Jagers et al., 2014). Environmental citizenship can be seen to build on several theoretical frameworks through this understanding of citizenship. The theory both builds and expands on social learning theory (Bandura, 1977, Siebenhüner, 2002a, Siebenhüner, 2002b, Social Learning, 2001) by giving reason to themselves and others, but according to Dobson (2010) expands on it by enabling citizens to create their own architecture rather than constantly having it provided and renovated. The study also builds on globalism and cosmopolitanism (Lechner and Boli, 2008) via its intrinsic focus on rights and beliefs beyond the nation-state, leaning towards a common understanding of a world citizenship. Dobson distinguishes environmental citizenship however as, in his terms, a post-cosmopolitan citizenship that sees globalisation as a producer of inequalities and injustice and focuses on citizenship in both the public and private arena (Dobson, 2003).

Understanding how Behaviour Changes

Explaining the motivation behind environmental citizenship is important, as change in behaviour caused by external incentives might be significant in creating momentum towards pro-environmental behaviour, but this alone does not constitute environmental citizenship. Pro-environmental behaviour should only be considered a result of environmental citizenship if it is guided by a sense of justice and moral motivation (Jagers et al., 2014). The motives affect the behaviour’s short- and long-term potential. Dobson focuses on the symbiotic relationship between governments and citizens in creating sustainable behaviour. His main arguments revolve around the

relationship between attitudes and behaviour and how governments best achieve long-term results. He states that fiscal incentives are useful when trying to generate behavioural change towards pro-environmental practices, but criticises financial instruments for having a negative effect on citizens' attitudes and behavioural change long-term (Dobson, 2009, Dobson, 2003). He argues that changing attitudes will lead to changes in behaviour, but the reverse causality is less like. Regarding road pricing he argues that under a fiscal incentive policy, people stop driving into the city centre because of the fear of a fine. This does not have the same potential of generating long-term pro-environmental behaviour, as economy becomes the main driver for change. Citizen that respond to environmental citizenship drive less in general because they know that driving cars contribute to global warming, that global warming affects poor people more than rich people, and that too much car-driving leaves a big environmental footprint (Dobson, 2009).

In short, fiscal incentives are useful in an attempt to change behaviour but not in changing attitudes. Financial penalties will invite people to try to avoid paying with no understanding or recognition of the underlying rationale of the incentives. He argues that if governments remove financial incentives, it would most likely also make citizens return to their old habits. He argues: *“The change in behaviour only lasts as long as the incentives or disincentives are in place”* (Dobson, 2009). The argument is portrayed in table 1.

Table 1: Building citizenship or promoting fiscal incentives

	Environmental Citizenship	Fiscal incentives and disincentives
Change attitudes (long term)	Good	Less good
Change behaviour (short term)	Less good	Good

Dobson does recognise that behaviour can be habituated over time, but he argues that governments should have a focus on both changing behaviour as well as changing attitudes in order to achieve long-term goals of pro-environmental behaviour (Dobson, 2009, Paterson, 2009).

The question of developing pro-environmental behaviour should however not be reduced to a discussion of how to balance carrots and sticks. Dobson argues that citizens are highly affected by a sense of justice, and not ‘softer’ virtues such as care and compassion (Dobson, 2009). He uses the 2004 tsunami in the Indian Ocean as an example:

“The key difference between my relationship to climate change and to the tsunami is that I am partially responsible for the first and not at all responsible for the second. This prompts very different types of moral response” (Dobson, 2009).

Ultimately, environmental citizenship is inherently bottom-up driven and is best encouraged by supporting community connectivity, local decision-making, volunteerism, education on the ethical and normative questions at stake, providing appropriate funding streams and building social capita (Dobson, 2010, Dobson, 2011).

Critique of Environmental Citizenship

Although the theoretical framework presents central elements in what generates pro-environmental behaviour, there are still three areas where theoretical weaknesses can be identified:

1. The framework lacks empirical proof of its theoretical arguments. Although recent studies (Dobson, 2010, Jagers et al., 2014) have measured and identified environmental citizenship, there is still limited evidence of how to best foster and nourish attitudes and pro-environmental behaviour.

2. Limited distinction between different types of behaviour and how they work in various ways. As previously stated, Dobson primarily looks at cheaper and easily accessible types of behaviour, which significantly distinguish from that of driving EVs.
3. The lack of continuity within the use of concepts, indicate that the theoretical framework has not been fully developed and tested.

Through applying the theoretical framework within the context of EVs, the analysis contributes with new insights by testing the applicability of environmental citizenship as presented in the introduction.

The following part will use the presented theoretical framework to form testable variables to measure the causality between pro-environmental behaviour, attitudes and fiscal incentives in the context of EVs in Denmark and Norway.

Deriving Measurable Variables

Using the concepts presented in environmental citizenship highlights embedded understandings of the concepts of behaviour, attitudes and fiscal incentives. Based on environmental citizenship, *pro-environmental behaviour* has been identified as the dependent variable in this study, which is caused by the two independent variables *attitudes* and *fiscal incentives*. I will also introduce *technical feasibility* as a condition variable, as infrastructure and the availability of technology are a precondition for changing behaviours, as Dobson (2009) also indicates. Using this terminology, the following parts will present and discuss how these concepts can best be transferred to and used in the context of EVs. Van Evera's methodological guide was used as inspiration for the classification of each variable (Van Evera, 1997).

Dependent Variable: Defining ‘Pro-Environmental Behaviour’

First of all, it is necessary to clarify what is actually meant by the concept of pro-environmental behaviour. While behaving in a pro-environmental way is constituted as an action driven by a feeling of justice, it might as well be caused by fiscal incentives, according to environmental citizenship. In this way there is no defining distinction between ‘traditional’ and pro-environmental behaviour. However, driving EVs constitute a behaviour that requires a previous act in order to be executed: Before you can drive an EV, you need to buy one. And this is not a simple switch in your daily life, as EVs represent a significant investment. For simplifying the analysis and based on the availability of data, my research will primarily focus and measure the *purchase* of EVs as an expression of pro-environmental behaviour. This distinction of how to define and measure pro-environmental behaviour will be maintained throughout the study and will be further addressed in the following chapter. However, in order not to oversimplify the conclusions, it is important to investigate in the analysis what the number of purchases cover. If citizens are simply buying, but not driving, EVs, this in itself does not constitute pro-environmental behaviour. It will actually represent the opposite, as an unnecessary overuse of resources for the production of the car.

Independent Variable: Defining ‘Fiscal Incentives’

Dobson defines fiscal incentives as capable of creating short-term behavioural change. Although the object of analysis is quite obvious, the volume as to what results fiscal incentives might generate and which kind of incentives should be included is less defined. Various types of incentives have been put into place regarding EVs such as car price, taxation, and the price of fuel (electricity). The analysis will compare different approaches, which will be exemplified in the following chapters.

Independent Variable: Defining ‘Attitudes’

Dobson is less precise when he uses the term attitudes, which seem to encompass all the pro-environmental attributes of environmental citizenship. This refers back to the

previously listed six characteristics of environmental citizenship listed in this chapter. It is interesting to add that previous research projects have found a small resemblance between attitudes and behaviour, and this has made many researchers question whether attitudes has any effect on behaviour (Montano and Kasprzyk, 2008). To go beyond this, Fishbein (Ajzen, 2012, Fishbein and Ajzen, 2011) argues that you need to distinguish between attitudes towards objects and attitudes towards behaviour. He concludes that attitudes towards the behaviour (for instance attitudes towards mammography) is a much better predictor of behaviour (obtaining mammography) than the attitude towards the object (in this case ‘cancer’) (Montano and Kasprzyk, 2008). Fishbein’s arguments point towards the need to focus on attitudes towards EVs rather than climate change in general as a predictor of behaviour, which correlate well with the available data.

In this regard, it becomes necessary to distinguish between various ways of defining attitudes. There are noticeable distinctions between Dobson and Fishbein’s use of the term “attitudes”. Fishbein argues that attitudes towards the behaviour can be either positive or negative, depending on what the participant thinks the outcome will be of the particular behaviour (Fishbein and Ajzen, 2011). Dobson uses attitudes to measure the presence of environmental citizenship. It refers to the type of values citizens use for acting in a certain way that cannot be limited to a simple yes/no or positive/negative statement. Environmental citizens will use arguments of common justice to account for their actions (Dobson, 2010). This makes room for a more complex measurement with several indicators, which will be discussed in the following chapter.

Condition Variable: Defining ‘Technical Feasibility’

As a condition variable, I will furthermore test the technical feasibility of EVs. Dobson (2009) puts a high emphasis on governments playing their part as well in installing infrastructure to facilitate pro-environmental behaviour, which is particularly interesting in a study of EVs. This makes it necessary to investigate technical feasibility

as a condition variable. Several theoretical approaches (which will be discussed in the analysis) argue that citizens will hesitate to switch to EVs if the infrastructure does not allow for a smooth and convenient transition to a system where EVs are either able to replace or enhance the abilities of citizens' mobility (Paterson, 2007, Paterson, 2009). Based on these arguments, there is a need to test and compare Denmark and Norway and to which extent the transition towards EVs is technical feasible – meaning how smooth and easily transferable the technology is to incorporate into the dominant mobile system of automobility (see chapter 7) (Elliott and Urry, 2010, Urry, 2005, Freudendal-Pedersen, 2009, Paterson, 2007). The theoretical assumption is that if the infrastructure is not up-to-date, citizens will simply hesitate to use a mode of transportation such as EVs, especially if it represents a significant economic investment as well.

Theoretical Hypotheses

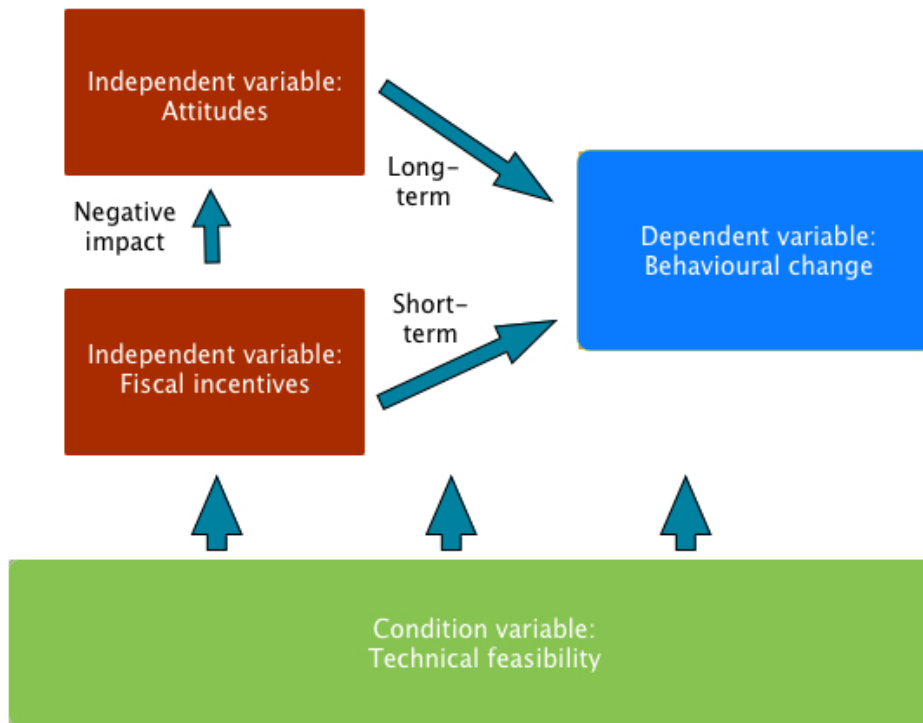
Summing up the points made from the theoretical discussions, several analytical components have been identified as essential topics of analysis. It is necessary to investigate actual behavioural change in the form of EV purchases, changes in attitudes, what political and economic incentives have been implemented, and the feasibility of the infrastructure. The discussions have generated a theoretical understanding of what creates and maintains pro-environmental behaviour based on environmental citizenship. These can be boiled down to three overall theoretical hypotheses:

1. *Attitudes*: Attitudes towards electric vehicles have a positive effect on how keen citizens are to invest in electric vehicles. Attitudes are the main driver for long-term results in generating pro-environmental behaviour.
2. *Fiscal incentives*: When analysing behavioural change, fiscal incentives should play a crucial role in developing short-term results. However, *fiscal incentives* will have a negative impact on *attitudes*.

3. *Technical feasibility*: In order to facilitate pro-environmental behaviour, proper infrastructure needs to be implemented to accommodate an easy switch in transportation mode.

The first two hypotheses pose the causal link that this research will test and discuss. The theoretical framework is portrayed below in the following analytical framework:

Figure 3: Analytical Framework



The framework illustrates the causal link between the defined variables within environmental citizenship. From the presented theoretical perspective, attitudes should lead to long-term behavioural change and fiscal incentives should be a useful tool in generating short-term behavioural change. The link between the two independent variables is illustrated as a negative impact from fiscal incentives onto attitudes. As

discussed, the link could also be reversed, as Dobson acknowledges that behaviour can be habituated over time. Although this is a relevant point, when discussing expensive practices such as buying an EVs, the chances of habituating behaviour seems less likely, as the removal of fiscal incentives would imply a significant impact on car prices, which further underlines Dobson's stated causal link.

What is apparent with this framework is the use of the terms *short-* and *long-term*. What specifically is meant by these time periods is not well defined in the theoretical literature, and could easily vary on the type of behaviour. This will be a central discussion for the analysis going forward.

Selection of Cases

Denmark and Norway have been selected as cases because (1) the cases share comparable ambitious, national climate and environmental targets (YCELP and CIESIN, 2014, Germanwatch and CAN, 2013), (2) the countries both focus on promoting EVs as a pro-environmental transportation form (Gronnbil.no, 2014b, Larsen and Grann, 2013), and (3) the cases represent different outcomes in the dependent variable. Theoretically this would imply that they must also have different outcomes in the independent variables. Only selecting two cases naturally limits the ability to draw decisive conclusions but strengthens the ability to go into detail with both examples.

The next chapter will present how to operationalize the presented concepts and hypotheses.

3. Methods

Building on the presented theoretical framework, this chapter will outline methodological considerations on how to measure and analyse the presented variables. In doing so, I will primarily focus my analysis on a theoretical discussion on secondary, quantitative data. This method contains both benefits and limitations to what the research is able to conclude. The following chapter will first describe the measurement and classification of each variable. This discussion will be followed by a presentation of the benefits and limitations for applying the presented method.

To the best of my knowledge, this is the first attempt to make a cross-national comparison of attitudes and behaviour towards EVs as described. Several studies have looked at how emotions and intentions affect EV-consumers (Moons and de Pelsmacker, 2012, Oliver and Seung-Hee, 2010), used surveys to analyse values and preferences in EV-products (Axsen and Kurani, 2013, Jensen et al., 2014) and measured the presence of environmental citizenship (Jagers et al., 2012, Jagers et al., 2011, Jagers et al., 2014). However, none of these studies have investigated the actual link between attitudes and behaviour towards EVs. While this study is by no means sufficient to fully paint the picture of how to generate sustainable behaviour, it does present new knowledge of the explanatory capabilities of environmental citizenship.

Operationalization of the Theoretical Framework

Using environmental citizenship has led to the classification of the identified variables, but the theoretical framework provides limited answers on how to operationalize the hypotheses in practice in order to test and measure attitudes, fiscal incentives and behavioural change. To draw meaningful conclusions, I have used external sources on how to compare each country within each category. It is important to stress that these models do not represent new competing theoretical frameworks to

environmental citizenship. Rather they serve the purpose of articulating how to categorise the countries within each variable. The following discussions will outline these approaches and will serve as an introduction to the analytical chapters.

Dependent Variable: Pro-Environmental Behaviour

When comparing actual behavioural change, I will look at both the current status of the amount of EVs being used and how the development has changed over time. This enables a deeper insight into how the development is progressing. The analysis will be based on:

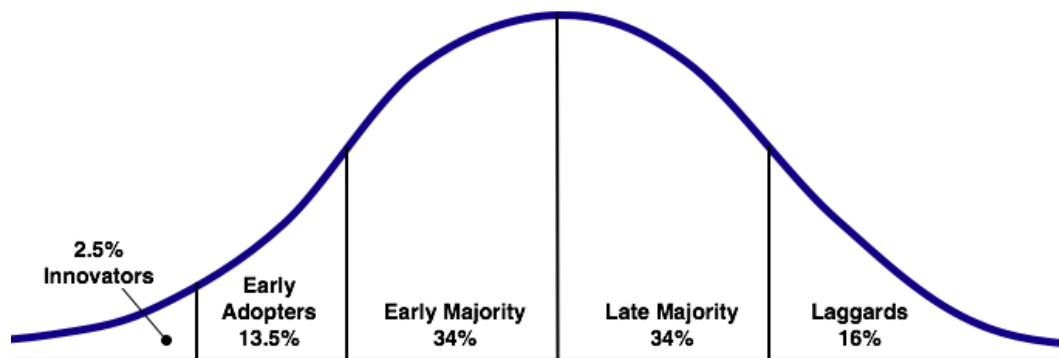
- Exclusive sales data in Denmark – provided by the Danish Energy Association (the data sheets are not included in the appendix because the data set is too comprehensive).
- Exclusive sales data in Norway – Provided by the Danish Technical University and the Information Council for the Road Traffic in Norway (similarly not included).
- Online data provided by *gronnbil.no* (2014b).

However, as briefly mentioned in the previous chapter there is a noticeable distinction between defining and measuring behavioural change towards EVs. The perfect case scenario would be analysing and comparing to what extent people drive EVs but due to limited data on this, my analysis will primarily focus on the *purchase* of EVs. While this might seem like a small difference, there are several pitfalls that need to be addressed. You could imagine some families own two cars, with one being an EV, and in this case it would be interesting to analyse, which one they actually use. While my analysis of the purchase of EVs would turn out positive within this setup, the actual result of pro-environmental behaviour would be negative, if the families rarely used the EVs. However, I will solely focus on *bought* vehicles for three main reasons:

(1) It still demonstrates a change in behaviour towards sustainable products, (2) the numbers are possible to accumulate and are more comparable, and (3) one must assume that the described scenario only occurs to a limited degree, as cars are typically bought to be used. I will still to some degree though look into to what degree citizens drive more than one car, as this is a valid limitation. See chapter 7 for this discussion.

To categorise the results, it would have been logical to apply Dobson's (2009) use of long-term and short-term behavioural change. However, this way of categorising leaves little room for variations and interpretations with only two classifications. Instead I will use Everett Rogers' (1962) model of the diffusion of innovations and its embedded indicators to rank and label how far Denmark and Norway have come in generating behavioural change. The model is pictured in figure 4.

Figure 4: Diffusion of Innovations



(Rogers, 1962)

The model seeks to explain how, why and at what rate new ideas and technologies spread in cultures. While this categorisation tends to focus more on *who* the adopters are, rather than *how many*, the distinction is still relevant for a discussion of how far both Denmark and Norway have come in creating behavioural change towards EVs. The categorisations are borrowed from Figenbaum and Kolbenstvedt (2013):

- *Innovators* are the first to adopt or utilise an innovation. They are the young risk-takers, with a high education, good finances and are in contact with scientific environments and other early users. Their risk tolerance allows them to try new technologies, which may eventually fail. Their finances are good enough to allow them to bear the loss.
- *Early adopters* come directly after early users. They also have better finances, education and status and are younger than those who adopt at a later date. Individuals in this group are often opinion leaders and important for the further introduction process. They are somewhat more cautious than the innovators, which give them credibility when communicating with others.
- *The early majority* adopts an innovation significantly later than the two former groups. Their social status is above average for the population, and they are often in touch with the early adopters, but they themselves are not opinion leaders.
- *The late majority* comprises a group that adopts innovations later than the average population. They meet innovations with scepticism. Their social status is lower and their finances are worse than the average. They are not opinion leaders. They have contacts with others in the same group but also members in the early majority group.
- *Laggards* are the last ones to adopt an innovation. They are often older, negative to change agents and have low social status and a poor economy. Their contact is directed towards the family and close friends.

(Figenbaum and Kolbenstvedt, 2013, Rogers, 1962)

The framework will be included into the discussions of how far each country has come in creating behavioural change, and ultimately Denmark and Norway will be labelled according to the categorisations. The model also brings Norway's positive

results into perspective, as the model highlights that there is still ground to cover before reaching the majority of citizens (see chapter 4).

Independent Variable: Fiscal Incentives

Analysing economic incentives is a more delicate business with many methodological traps. First of all, it is important to stress, that this is not an economic study and I do not have access to classified economic data on the development of car prices. Instead I have allied myself with external analyses of fiscal incentives for EVs. Studies by the International Council on Clean Transportation (Mock and Yang, 2014), the Global EV Outlook (EVI and IEA, 2013) and the Danish Energy Association (DEA, 2013) compiles global results on incentive structures and results, which will be used to highlight differences in national approaches and policies.

As it is difficult to distinguish what is a ‘small’ and ‘big’ fiscal incentive when comparing countries that vary in size and economy, I will categorize each country based on how the incentives relate to each other. Inspired by the International Council on Clean Transportation (see chapter 5), I will rank the countries based on the total fiscal incentive provided based on the percentage of vehicle base price. Although many different variations of incentive types exist, the total price is both a telling and comparable measure of the effect of the fiscal incentives. This enables a categorisation tool where countries can be compared according to the box below.

Categorisation	Explanation
No incentives	EV car price has not been reduced.
Minimum incentives	EV car price has been reduced from 1 to 10 pct. of vehicle baseline.
Below average incentives	EV car price has been reduced from 11 to 30 pct. of vehicle baseline.
Above average incentives	EV car price has been reduced from 31 to 50 pct. of

	vehicle baseline.
Top incentives	EV car price has been reduced with more than 50 pct. of vehicle baseline.

The categorisation, however, fails to include non-economic incentives such as access to fast lanes, which will also be included in the discussions (see chapter 5).

Independent Variable: Attitudes

To analyse the Danish and Norwegian attitudes towards EVs, I will be using surveys to measure and categorise the citizens' motivations. For this purpose I will primarily be using three surveys as empirical data. A discussion of the pros and cons of using secondary data can be found later in this chapter. The surveys are:

- A cross-national Michelin survey with 1.000 respondents in Denmark, Norway and Sweden in 2013, which I have gained exclusive access to (see survey results in Appendix 1 and 2).
- A public Danish survey among 1.022 Danish car users performed in 2011 (Jensen and Etrans, 2011).
- A public Norwegian survey from 2013 with 1.858 EV user respondents (Haugneland and Kvisle, 2013).

The surveys will not be able to measure the presence of environmental citizenship in Norway and Denmark, as the data is inadequate to perform this type of research. Jagers et al. (2013) successfully conducted such a study in Sweden with in-depth surveys, which would be interesting to perform in Denmark and Norway as well. The used surveys do not have the same focus on social justice and general environmental awareness, but instead focuses on citizens' motivations for either purchasing or not purchasing an EV. Instead, this study will measure and categorise citizens' attitudes

based on what they articulate as their main motivation for their actions. This means citizens categorised with *pro-environmental attitudes* use arguments relating to the six characteristics of environmental citizenship presented in chapter 2, which primarily implies citizens who use references to environmental concern as their main motivation. Alternatively, citizens will be characterised with *fiscal incentives* and *other factors* if they refer to such external factors for their behaviour. The categorisations are listed below.

Categorisation	Argument
<i>Pro-environmental attitudes</i>	Citizens refer their motivation for purchasing EVs to the six developed characteristics of environmental citizenship (presented in chapter 2). This implies using arguments of environmental concern as main motivation for citizen behaviour or non-behaviour.
<i>Fiscal incentives</i>	Citizens refer to the fiscal incentives as their main motivation.
<i>Other factors</i>	Citizens use arguments of practicalities or technical feasibility.

The categorisation tool specifically targets the hypothesis of the supposed negative impact of fiscal incentives on pro-environmental attitudes. As Norway and Denmark have significantly different levels of fiscal incentives (see chapter 5) this should also have consequences for citizens' pro-environmental attitudes towards EVs. The discussion is relevant as environmental citizenship argues attitudes are essential for long-term behavioural change, as discussed in chapter 2.

The categorisation will be applied to each country, which means that the sum of the citizens' responses in Denmark and Norway will be rated and compared. The

responses will be analysed based on its national expression rather than seen as various groupings within the nation-state. The benefit of this method lies in the comparability of the two countries, but the method fails to acknowledge potential rising sub-cultures of environmental citizenship, as the theoretical focus is not on the individuals but on the nation as a whole. To meet this critique, the analysis will also compare and discuss the level of pro-environmental attitudes within each country (see chapter 6).

The used surveys contain responses from people who both do and do not own an EV. Both groups are interesting to analyse from a theoretical standpoint. Arguments on environmental benefits point towards a change in attitude, while a motivation based on economic benefits point towards external factors as the main driver for change. The categorisations are however a simplification of reality, as one could easily imagine citizens being motivated for more than one reason. You buy an apple because it is tasty, healthy *and* affordable. For this reason, the classification will not be a simple either/or, but rather used for a discussion on how the responses differ in Denmark and Norway.

An important thing to mention is that unlike the results within behavioural change, I am unable to measure change in attitudes over time. Although the listed Danish survey is a bit older than the others, the questions within each survey differ in design and content. This makes it tougher to decisively investigate actual change in attitudes over time. The results are however still useful in identifying what motivates citizens towards behavioural change. A more historic comparison on how much environmental arguments affect citizen behaviour would be a welcomed contribution to the study.

Condition Variable: Technical Feasibility

The condition variable is set up to investigate to what extent the behaviour is driven or limited by technical facilities for instance charging points and accessibility of EVs. The analysis is closely tied to a discussion of the theoretical concept of automobility (Urry, 2005, Paterson, 2007). As this will be more of a theoretical discussion, and not

an explanatory independent variable, technical feasibility will not be categorised nor ranked in the same way as the previous variables to avoid confusion.

Omitted Variables

At this point it becomes relevant to briefly mention the variables I will not be discussing. These are all factors that future studies might benefit from investigating further. As the theoretical framework focuses on citizens and their motivations, limited attention will be given to (1) political strategy (2) national economy and (3) alternative competing types of transportation. Political strategy will indirectly be discussed within the role of fiscal incentives, but a later study would be interesting of how to most successfully promote and inspire pro-environmental behaviour. Similarly, although the research focuses on fiscal incentives, this is not an economic study as such. The superior financial situation in Norway will to some extent be touch upon when discussing fiscal incentives, but this study is inadequate for analysing and comparing economic factors in depth. A market analysis of car models and types is also beyond this study's capabilities. Although it is important to acknowledge the importance of innovative and competitive car models, it is still more or less the same car models that are pushed forward internationally (see chapter 4). From a theoretical standpoint of trying to understand what makes one person (and not another) buy a car, it becomes unnecessary to investigate the development and competitiveness of the particular car from a product standpoint. A cross-examination of different modes of transportation would also be interesting when investigating to what extent EVs are replacing gasoline cars, and not public transportation or bikes. However, the cases have been selected because they both have to some extent a national focus on EVs, and not promoting alternative forms of transportation.

Using Secondary Data

The research is mainly based on secondary data through surveys and statistics. The approach is useful since it enables the research to analyse content that would otherwise have been too time-consuming and expensive to collect for a thesis paper. Plus it enables me as a researcher to gain insight in citizens' opinions across borders and regions, which I would not otherwise have been able to. Furthermore it enables me to compare and discuss results in different surveys. This is relevant when discussing possible shifts in behaviour and attitudes. However, the secondary content does not come without consequences. First of all, by using secondary content there is an obvious lack of familiarity with the data. It is beyond my control how and where the data was collected and by whom. Secondly, it raises concerns over the quality of the data (Bryman, 2008). For instance, in the Michelin survey (see Appendix 1 and 2), electric cars were not the primary objective of the survey. This raises concern whether or not these results are as reliable as the other surveys. Thirdly, by not having orchestrated the surveys myself, it forces me to be dependent on the way questions were phrased and the variables being used. I cannot add absent questions at a later stage. Similar concerns could be raised when using statistics for my analysis. Data on car sales should be trustworthy, while still being beyond my control to check. Concerning cross-national comparisons there might for instance be different ways of registering and documenting car sales. The following parts will briefly discuss the benefits and limitations of each used data type.

Using Surveys

The analysis of attitudes will be based on surveys, as previously presented. The three combined surveys allow for responses in:

- Prioritisations – Why purchasers choose one car type over another.
- What key arguments they use for their selections.

- How people use EVs. For instance, whether the EV is the primary or secondary car in the family.

Using several surveys allows for deeper insight and strengthens the analysis against potential selection biases. However, the amount of respondents is still relatively small and could be critiqued, as I use the responses as national representation. In the optimal setting I would have had a larger response rate than the approximately 2.500 citizens per country, but the results are still useful for analysing preferences and motives. If I could have redesigned the questions myself, I would have added a greater emphasis on citizens' pro-environmental attitudes in similar fashion as Jagers et al. (2013) studies of environmental citizenship in Sweden. This would have provided a greater insight into the impact of the fiscal incentives in Norway.

Some critics have argued that social survey research based on questionnaires and interviews have been shown to relate poorly to people's actual behaviour (Bryman, 2008). Borrowed from Bryman (2008) with a few of my own additions, I have listed some concerns below that are well worth mentioning for this type of research:

- *Problem of meaning.* People may vary in their interpretations of key terms in a question.
- *Problem of omission.* When answering the question, respondents may inadvertently omit key terms in the question.
- *Social desirability effect.* They may exhibit a tendency towards replying in ways that are meant to be consistent with their perceptions of the desirability of certain kinds of answers.
- *Language barriers.* Since the questions have been formulated in different languages, some key interpretations and formulations might affect different responses.

- *Gap between stated and actual behaviour.* How people say they are likely to behave and how they actually behave may be inconsistent.

These are concerns that will be included in the analysis and would make it difficult to solely measure behaviour based on surveys alone. Especially the latter concern on the gap between stated and actual behaviour is relevant for this type of analysis in a discussion of stated preferences and intentions. In a research of car use, luckily there are hands-on usable data on what people actually do through data on car sales. This furthermore makes it possible to compare respondents' intentions and what they actually do in practice.

Limitations to Statistics

The use of official data on car sales is more directly applicable but when using secondary data, there are still limitations that need to be addressed. For instance, three things are important to mention about the numbers of car sales in Denmark:

1. The numbers cover new registrations in Denmark and because of this, the numbers do not include scrapping or export, according to the data providers. For instance, Renault recalled 150 Renault Fluence cars after the bankruptcy of the battery-switching company BetterPlace in 2013. Also worth mentioning, a part of the sold Tesla models were exported to Norway despite being registered in Denmark as a result of higher demand in Norway. However, no exact numbers exist to the magnitude of this limitation.
2. The numbers do not include the car models Renault Kangoo Z.E or Mercedes Vito-e due to the data generator was unable to differ between the electric and gasoline versions of the cars.

3. Both private and corporate purchases are included. Although both numbers matters, it would be useful to separate the two since my main focus is on citizens and not corporations.

While these considerations might have limited implications for the analysis in practice, it does demonstrate the need to be critical of secondary data.

The following chapters will begin the analysis of the presented variables. The results within each chapter will be discussed in chapter 8 to sum up the main points and compare and link the findings with the theoretical hypotheses.

4. Dependent Variable: Behavioural Change

This chapter will examine the dependent variable and categorise to which degree the two countries have experienced behavioural change towards EVs. Based on the theoretical discussion of pro-environmental behaviour, the chapter will investigate both the long-term and short-term purchase of EVs, including a brief discussion of what the sales data tells us about the purchasers. This discussion will be followed by a categorisation in accordance with Rogers' (1962) model of diffusion of innovations. The graphs and data used for this analysis are based on my own calculations of the provided data.

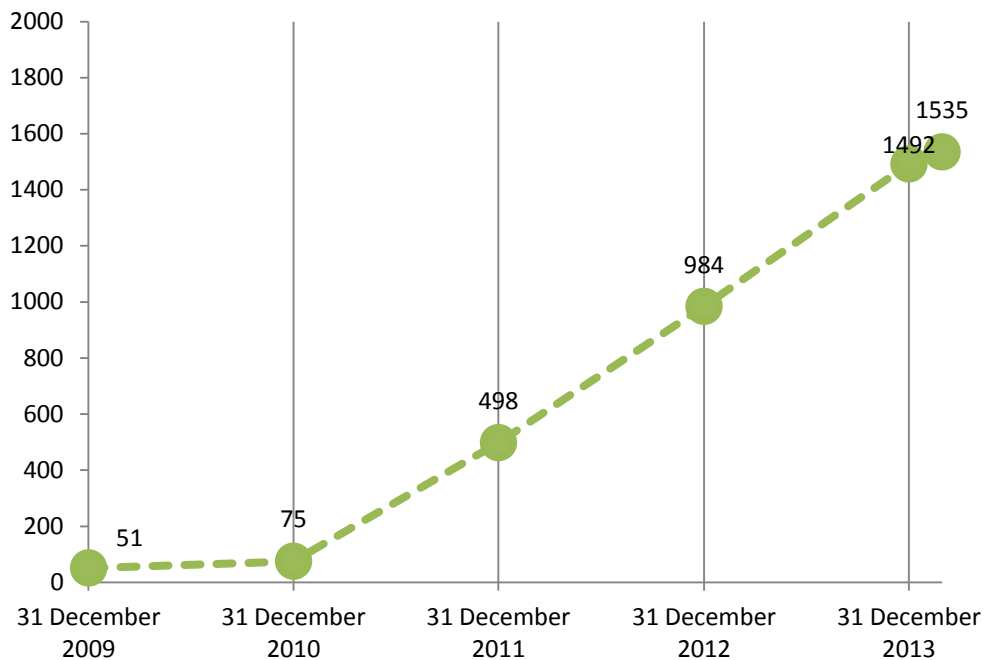
It is worth mentioning that the amount of registered EVs in both Denmark and Norway is officially higher than the listed numbers because the used data only begins from 2007 in Norway and 2009 in Denmark with no info on previous registrations. The used numbers are thus lower than what other sources might write online. It is still however useful for comparing results within these specific years.

The chapter will first examine Denmark and Norway individually before comparing and categorising the results at the end of the chapter.

Denmark

As presented in the introduction, Denmark is not one of the leading nation-states when it comes to transitioning to EVs (EVI and IEA, 2013). Despite ambitious climate and energy targets, transportation has been seen as one of the biggest obstacles within pro-environmental policies for Denmark to overcome. And EVs are one of the main reoccurring topics and suggested solutions for the discussion of how to move forward (Larsen and Grann, 2013). Nevertheless, Denmark has experienced a steady rise in the number of registrations of EVs in Denmark since 2010, as portrayed in figure 5.

Figure 5: Total number of registered EVs in Denmark, 2009-2014

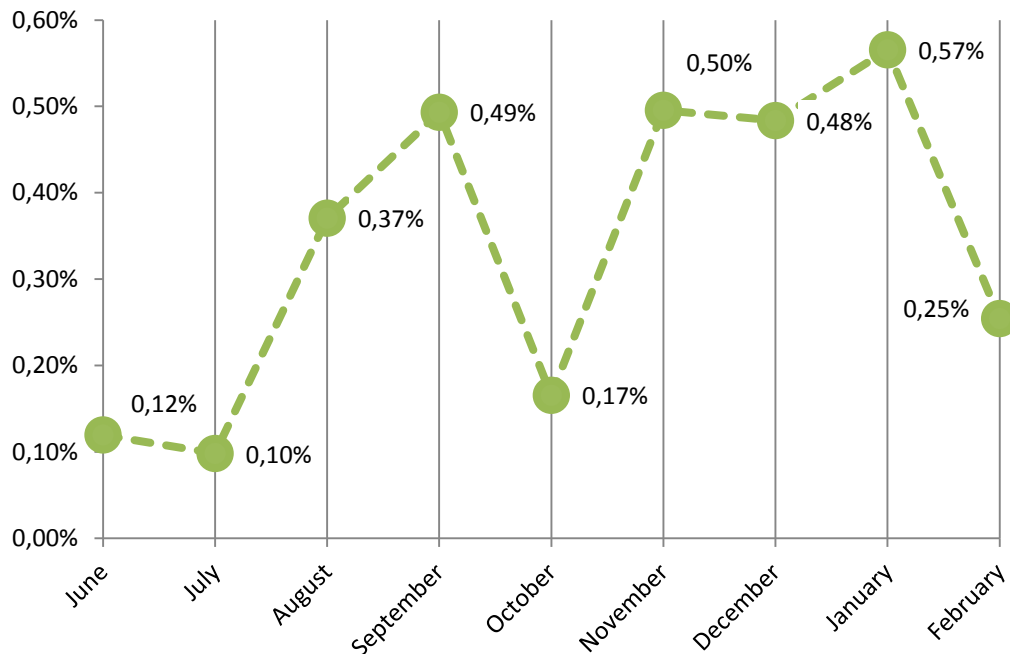


The curve can best be described as a linear, steady progress. With approximately 500 newly registered EVs every year since 2010, the EVs have been able to generate some momentum, while demonstrating that the car type is a possible means of transportation. The Danish Energy Association has even called 2013 a significant year for EV uptake, although the numbers were unspectacular compared to previous years, by highlighting the arrival of new models and the setup of national infrastructure (DEA, 2013).

Yet when looking at the monthly uptake, the numbers seem less impressive (see figure 6). The numbers have been calculated by looking at how many EVs were sold out of the total pool of car sales in the particular months. At the highest point within the last year, EVs never succeeded in generating a higher monthly market share than 0,57 pct. in January 2014. Although this could also have been seen as a turning point for the better with a growing market share up until this point, the negative results in February 2014 debunks that belief. At the lowest point in July 2013, the

market share was down to only 0,10 pct., and throughout the last year, the numbers look rocky and unsteady with no sign of change anytime soon.

Figure 6: Monthly percentage of new registered EVs in Denmark, 2013-2014



Combined with figure 5, the Danish results show a steady but insignificant growth in EV sales. They do however demonstrate that EV sales are happening and that a transition might be possible under the right circumstances. Referring to Dobson's (2009) classification of short- and long-term behavioural change, the Danish results cannot be classified as any of them, as the results do not consistently demonstrate a true change of behaviour for more than a limited group of citizens.

The following section will look deeper into who the buyers actually are by investigating what type of cars are sold. Although this info does not say much about the citizens' behaviour, it provides info on how expensive each model is, and when and where they were bought.

The Buyers in Denmark

Looking at the actual cars that have been sold, it seems to be same models that grow in popularity throughout the years. Table 2 below shows the development in car models from 2008 to 2013. The listed car prices were taken as the minimum price for each car in 2014 (Clever.dk, 2014), as I do not have access to the development of car prices over time. Some of the cars do not have listed prices, which is a result of either the car is no longer being sold or because it is sold at such a limited rate that exact prices are not available.

The numbers tell an unsteady story of which car types have been successfully pushed onto the market and when. The earlier Norwegian Think models were the biggest success in 2009 until the company went bankrupt in 2011. In 2011, Peugeot and Citroen took the lead with their models Citroen C-Zero and Peugeot iOn with the primer being a bit more expensive today with the listed price of 224.995 DKR. In 2012, both these car models declined in sales with the new market leader Renault Fluence taking over. Interestingly worth noting, in 2013, Nissan's popular model, Nissan Leaf, was the most sold EV of any year in Denmark, but the car was closely followed by the much more expensive luxury car Tesla Model S, which was named car of the year in 2013 (EVI and IEA, 2013) and stands at a minimum price of 537.000 DKR.

Table 2: EV Car Models, Denmark 2008-2013

Car Models	Price DKK	2008	2009	2010	2011	2012	2013	Total
Citroen C-Zero	224.995,-			1	116	86		203
Kewet Buddy	-	2	4	2	2			10
Kewet Buddy Plus	-		1					1
Kewet Citi-Jet	-		4					4
Mitsubishi IMiEV	199.998,-				95	25		120
Nissan Leaf	209.690,-				12	73	212	297
Peugeot iOn	174.500,-				128	90	9	227
Renault Fluence	210.000,-				57	198	38	293
Renault Twizy	58.400,-						14	14

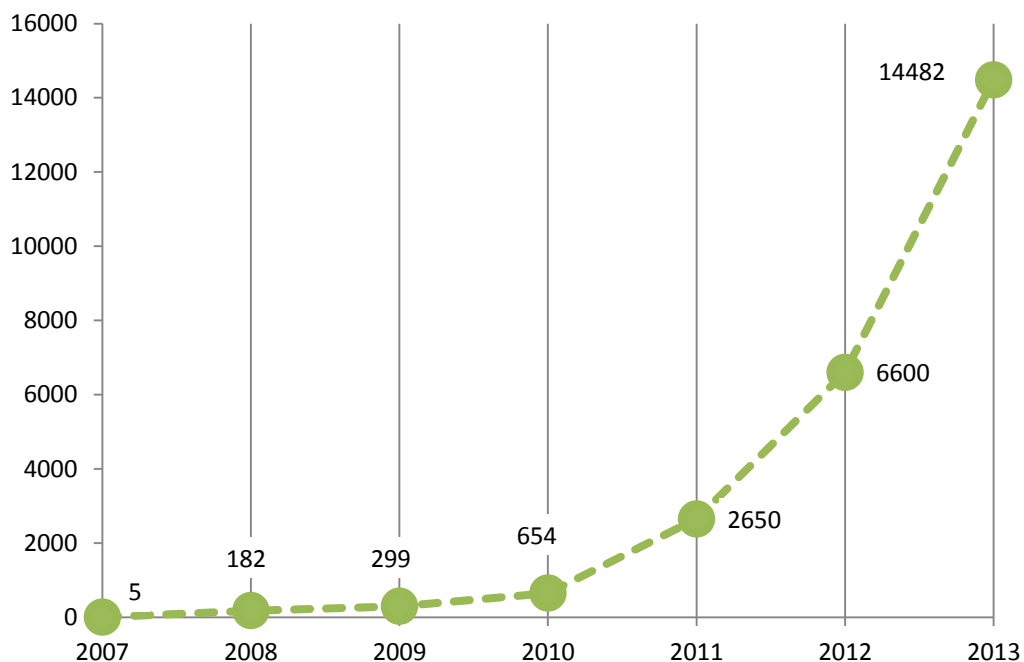
Renault Zoe	161.400,-						92	92
Reva	-		1	1				2
Reva De Luxe	-			1			1	2
Reva G-Wiz	-					1		1
Reva Standard	-			2				2
Tazzari Zero	-			3	2	1		6
Tesla Model S	537.000,-						112	112
Tesla Roadster	-		13	9	8	12		42
Think City	-		28	6	3			37
Volkswagen e-Up!	186.000,-						30	30
Total		2	51	25	423	486	508	1495

Looking purely at these numbers, not much can be said about the Danish purchasers' relations to environmental citizenship. The numbers do not tell us whether the citizens are young, old, rich or where they live. It does however paint a picture of a focus on traditional car types that look similar in functionality and shape to regular gasoline cars, spiced with a hint of luxury buyers in Tesla.

Norway

Norway's results differ in many ways. The growth in sales has been much more exponential compared to Denmark. However it is worth noting that despite the international praise, the positive results in changing behaviour towards EVs in Norway is a relative new development (see figure 7).

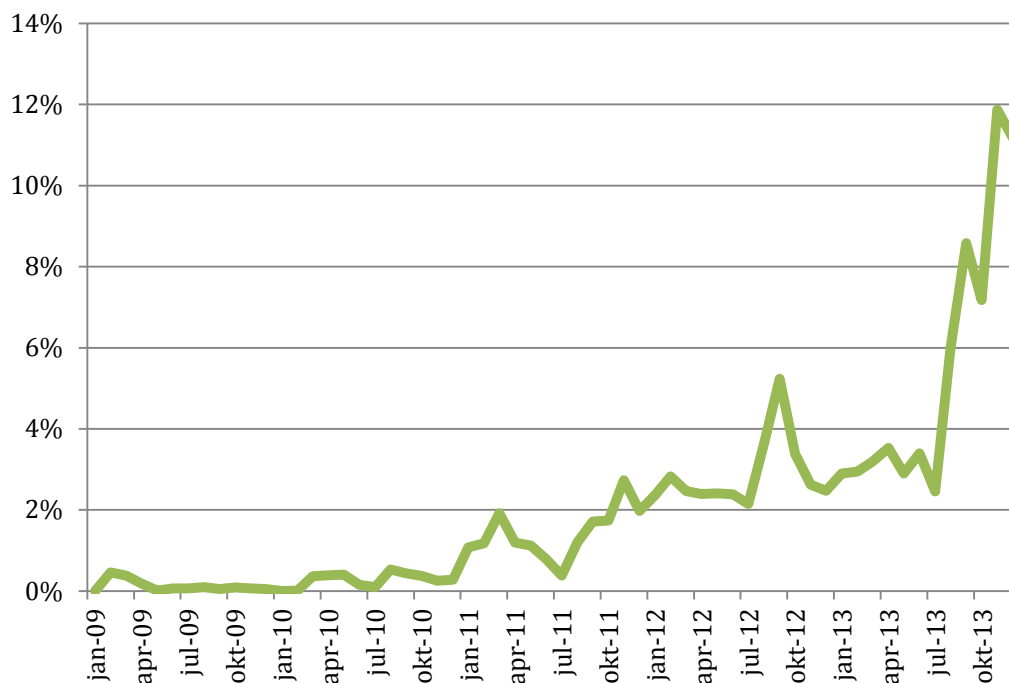
Figure 7: Number of registered EVs per year, Norway 2007-2013



It was not until 2010 (the same year as in Denmark) that significant results were seen in Norway. Prior to this year, only limited sales were registered. Evidently this leads one to conclude that something must have happened in that year that triggered the rapid growth, most likely in reference to the availability of new car models. Although I do not have access to this data, sources show that the exponential growth has continued in 2014 (Gronnbil.no, 2014b).

The same indications of the exponential growth in behavioural change can be found when looking at the percentage of registered EVs per month (see figure 8).

Figure 8: Percentage of EVs registered per month, Norway



The number of registered EVs peaked in November 2013 with a total market share of 11,87 pct. This is a significant and explosive development considering that the market share was down to only 2,46 pct. in July 2013. Using Dobson's perceptions of behavioural change, we can both identify short-term and indications of long-term behavioural change within a larger group of the Norwegian citizens. While a market share of nearly 12 pct. is impressive, it is still worth noting that 88 pct. of car purchasers chose not to buy an EV that particular month. So while the numbers continue to rise, Norway has still some ground to cover to reach the majority of Norwegians in their attempts to diffuse EVs onto the market, in reference to Rogers' (1962) model.

The Buyers in Norway

In similar fashion to the Danish section, I have listed the car models that were sold during the timespan from 2008 to 2013 in Norway. The listed car prices were collected via gronnbil.no and listed in Norwegian crowns (Gronnbil.no, 2014a).

Table 3: EV Car Models, Norway 2008-2013

Car Model	Price NOK	2008	2009	2010	2011	2012	2013	Total
BMW i3	249.900,-						51	51
Citroen C-Zero	159.900,-				208	513	95	816
Fiat 500	-					3		3
Fiat Fiorino	-		11	1	1	4		17
Ford Focus	218.000,-						83	83
Mercedes-Benz SLS	2.850.000,-						2	2
Mia (other models)	-					11	3	14
Mia VE79	-						2	2
Mitsubishi I-MiEV	159.900,-			8	1040	665	367	2080
Nissan Leaf	219.700,-				373	2298	4604	7275
Peugeot iOn	169.900,-				213	407	88	708
Smart ForTwo	-						2	2
Tata Indica	-			1				1
Tazzari Zero	-						1	1
Tesla Model S	461.000,-						1983	1983
Tesla Roadster	-		13	14	28	32	3	90
Think City	-			252	133	16	8	409
Think Think	-	177	93	79		1		350
Volkswagen e-Up!	187.000,-						580	580
Volvo C30	-						10	10
Total		177	117	355	1996	3950	7882	14482

What first pops to mind when looking at these numbers is that Norway had more EV models available than Denmark in 2013. This is likely a result of Norway being the current hottest market for EVs, which drives producers towards this market. However, it is still the same cars that are the best-selling models in Norway as in Denmark. Nissan Leaf has been the most popular model since 2012 with Tesla's Model S following after with significant short-term results. The indications are that purchasers

are following the same trends in both countries with a mix of more regular priced vehicles combined with luxury models.

Conclusion

It is clear when looking at the numbers that Norway has experienced a much more rapid and exponential growth in behavioural change towards EVs. In Denmark, the growth has been more steady and linear, while never fully breaking through to the general public. However, although it is clearly on its way, Norway cannot be described to have reached the greater mass population just yet. By applying Roger's (1962) categorisation tool, Norway can best be described to have reached the early adopters, however with potential for further improvement in the coming years. Denmark on the other hand can at best be seen to have reached the lowest category of innovators solely based on their level of sales. This leads to the following categorisations:

Country	Behavioural change
Norway	Early adopters
Denmark	Innovators

These categorisations illustrate diverse results. What is especially relevant with these numbers for the upcoming chapters is what lies behind the successful numbers in Norway, and to what extent they have been driven by fiscal incentives or pro-environmental attitudes. If the presented hypotheses are to be true, there should be a link between Norway's successful results and the independent variables. This will be addressed in the upcoming chapters.

5. Independent Variable: Fiscal Incentives

This chapter will investigate and discuss the fiscal incentives implemented by the governments of Norway and Denmark. The analysis is based on the theoretical discussion of to what extent fiscal incentives are capable of generating short- and long-term behavioural change as presented in the theoretical framework. The hypothesis is that fiscal incentives are capable of generating short-term behavioural change but fail to maintain long-term progress, as citizens will use economy as their main motivation with no understanding of the underlying environmentally-friendly rationale behind the policy (Dobson, 2009). This chapter will solely focus on which fiscal incentives have been implemented, while the following chapter will investigate how these incentives relate to changes in attitudes and motivations for investing in EVs.

As the discussions in this chapter will demonstrate, there are many different types of incentives with various effects to different types of car models. The incentives also function in various ways depending on whether they are tax reductions, fuel taxes, tolls, or parking price reductions. Some incentives might only have indirect economic benefits such as exclusive access to fast lanes on highways. While each incentive deserves individual recognition and analysis, this paper will treat them on a general level and compile them to categorise the overall incentive structure of each country. This means I will not be able to go into detail with what incentive has been the most successful in generating behavioural change, which is a shame as the paper's main objective is to shed more light on how to foster pro-environmental behaviour. However, from the theoretical standpoint of environmental citizenship, it is not distinguished between what type of incentive is in place. Rather the focus is on what consequences and relationship fiscal incentives have with attitudes and long-term behavioural change (see chapter two). A more individual examination of each incentive will be saved for future studies.

The following sections will first investigate Denmark and Norway's individual fiscal incentives followed by a comparative international discussion.

Denmark

In Denmark, the focus has mainly been on promoting economic incentives. EVs and hydrogen fuel cell cars are exempt from registration and road taxation and the legislation has been in place since 1984 and is currently set to run until 2015 on a trial basis (EVI and IEA, 2013, DEA, 2013, Praëm, 2012). Some critics have however pointed out that despite the exemptions, EVs still pay more in VAT than smaller gasoline cars contribute with in registration fees. This way, the system still provides the biggest structural economic boost to these smaller vehicles, and the sales numbers back this statement up. Smaller gasoline cars currently consist of 85 pct. of the market share (DEA, 2013). In some municipalities, such as Odense and Frederiksberg, EVs have also been allowed to park for free (Praëm, 2012).

Norway

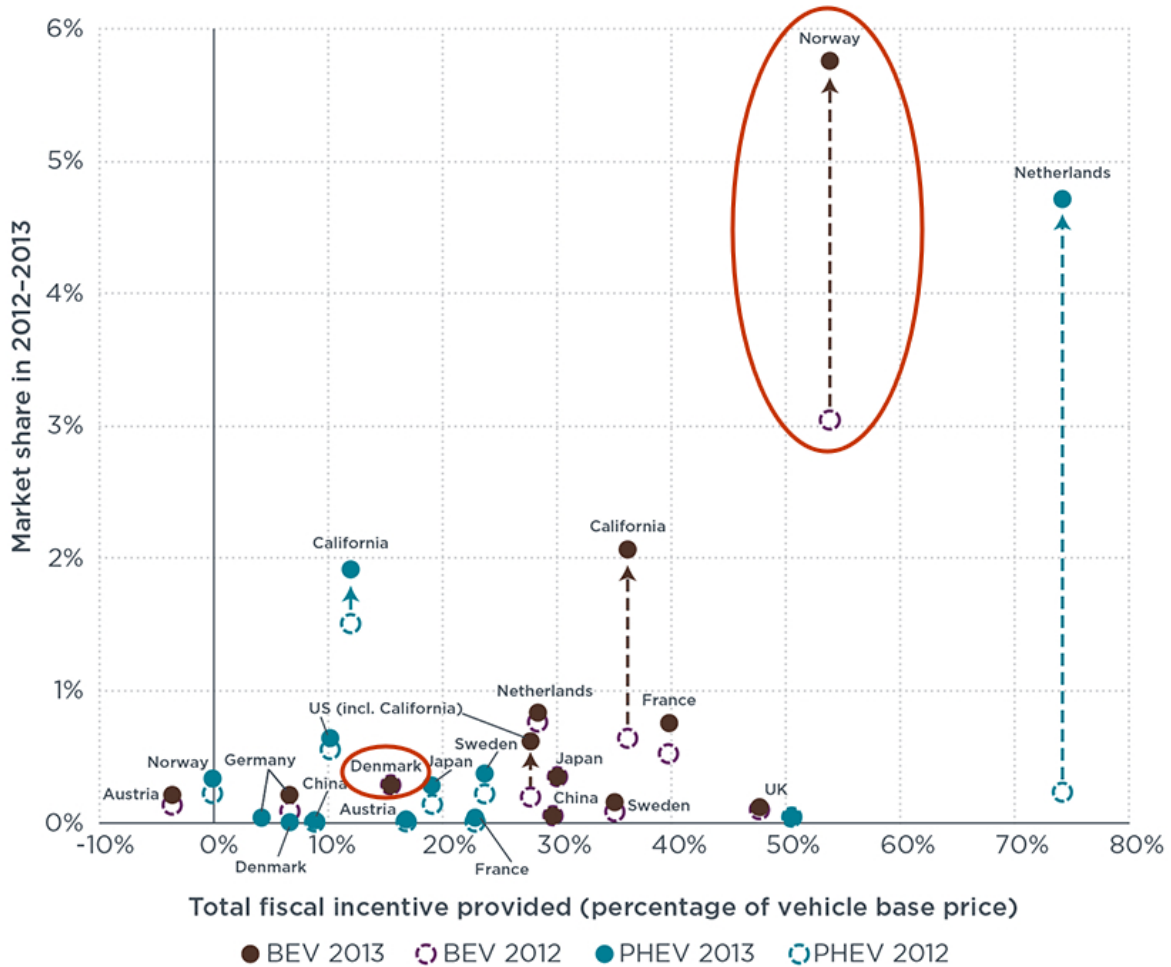
In Norway, the incentives can likewise be divided into both national and local levels. The difference is that there are both more and bigger incentives than in Denmark. In Norway, the EVs have been exempt from the vehicle registration tax since 1990 in the same format as in Denmark. However the legislation has been made permanent in Norway since 1996. Beyond this, EVs have also been exempt from paying VAT since 2001, combined with the lowest annual license fee and lower imposed benefit taxation for company cars. There are however public concerns whether the fiscal incentives will be renewed in 2017 (Merrill, 2014). As a non-economic benefit EVs have their own licence plates labelled "EL", making it easy to spot with possible educative effect on the general public (Figenbaum and Kolbenstvedt, 2013, DEA, 2013, EVI and IEA, 2013).

In the municipalities, EVs have had access to bus lanes on selected road sections since 2003 in greater Oslo. It is assumed that the setup has had a positive impact on the sale of EVs due to otherwise major time delays during local rush hour traffic (Figenbaum and Kolbenstvedt, 2013). EVs have also become exempt from road tolls and ticket fees on national road ferries, including access to public parking free of charge locally (EVI and IEA, 2013, Figenbaum and Kolbenstvedt, 2013).

International Comparison

While Norway's incentive structure is diverse and impressive on paper, it is difficult to assess how these initiatives actually compare to Denmark financially. Incentives work differently in various contexts, and as I am not performing an actual economic study, I will be using external comparisons of EV fiscal incentives to compare and evaluate the national incentives. The International Council on Clean Transportation performed just this type of comparison in May 2014 where they compared fiscal incentives with the number of car sales of EVs and hybrid cars (Mock and Yang, 2014). Figure 9 shows a comparison of the total incentives provided as a percentage of the vehicles' base price combined with the total market share of BEVs (battery electric vehicles) and PHEVs (plug-in hybrid electric vehicles). This means the comparison is made based on what price the car officially is listed at with the total fiscal discount deducted. The study focuses only on three types of policy incentives: (1) One-time bonuses upon the purchase of EVs, (2) reduced purchase and/or annual tax, and (3) electricity prices compared to fuel prices as a result of lower taxation or energy costs (Mock and Yang, 2014). Although a comparison like this fails to address the full effect of policies such as access to bus lanes and free parking, the results are still interesting and set up for an easy comparison of the effect of fiscal incentives.

Figure 9: Total fiscal incentives and market share, 2012-2013



(Mock and Yang, 2014)

The numbers show the importance of fiscal incentives for generating results in EV sales, as the countries with the biggest incentives also hold the biggest market shares. At the same time the study shows, that the relationship between fiscal incentives and market share is elusive and cannot solely be reduced to economy, which to some extent could speak in favour of environmental citizenship. For instance, some countries stand out. In the UK, plug-in cars account for only 0,2 pct. of the total vehicle sales despite EV-exemptions from the country's CO2-based vehicle taxation system and

London's congestion charge scheme combined with a strong subsidy per vehicle (Mock and Yang, 2014).

The study promotes Denmark as an interesting case, as the incentive structure for private EVs are higher than for company cars, but all in all the Danish market share results seem to match the push from the national fiscal incentives. In Norway, the study clearly highlights the superiority in both total fiscal incentives and in market share compared to Denmark. The study also shows that Norway has relatively high gasoline prices with relatively low electricity costs, which further enhances their market push (Mock and Yang, 2014). An interesting point to add is the big gap between Norway's incentives for BEVs and PHEVs. Most countries have to a smaller degree focused on promoting both vehicle types. Significantly promoting one over the other potentially enhances the market push for this particular model, as Norway's BEV and Netherlands PHEV results demonstrate.

Conclusion

This chapter has highlighted the big gap in fiscal incentives between Denmark and Norway. Based on the categorisations presented in chapter three, the two countries have been ranked according to their level of incentives. Norway's significant focus on EV fiscal incentives has earned them the 'Top incentives' categorisation. On the other hand, Denmark's smaller national attempts to promote EVs financially has been categorised as 'Below average incentives'. The results are portrayed below:

Country	Fiscal incentives
Norway	Top incentives
Denmark	Below average incentives

While these results correspond well with the level of behavioural change discussed in the previous chapter, the results are interesting from a theoretical perspective, as

Dobson identifies a negative link between the two independent variables – fiscal incentives and attitudes. To confirm the theoretical hypotheses, the fiscal incentives of the Norwegian government should lead to negative results within pro-environmental attitudes, causing negative consequences for the long-term uptake of EVs and the pro-environmental attitudes in general. This will be addressed in the upcoming chapter.

6. Independent Variable: Attitudes

Building on the previous discussions, this chapter will investigate how citizens articulate their motivations for their behaviour. We now know how many citizens have been changing behaviours towards EVs and what fiscal incentives have been put into place. The interesting discussion from the perspective of environmental citizenship is now how and to what extent these results relate to and affect citizens' pro-environmental attitudes. The discussions will be based on survey results and a theoretical discussion of what causes change in attitudes. Dobson's theoretical argument is that fiscal incentives will have a negative impact on attitudes and long-term behavioural change. However, since the previous chapters have demonstrated that the change in behaviour in both countries is relatively new (starting in 2010), it becomes hard to measure the long-term effects of the fiscal incentives. This limits the possibility of identifying 'smoking gun' evidence on the relationship between the independent variables without further studies. Meanwhile, as the following chapter will demonstrate, it is still possible to highlight differences in attitudes and argumentations for buying EVs between Denmark and Norway.

The discussions will start out with a comparison of an international survey with provided exclusive content by Michelin (see Appendix 1 and 2) followed by a discussion of surveys from each country.

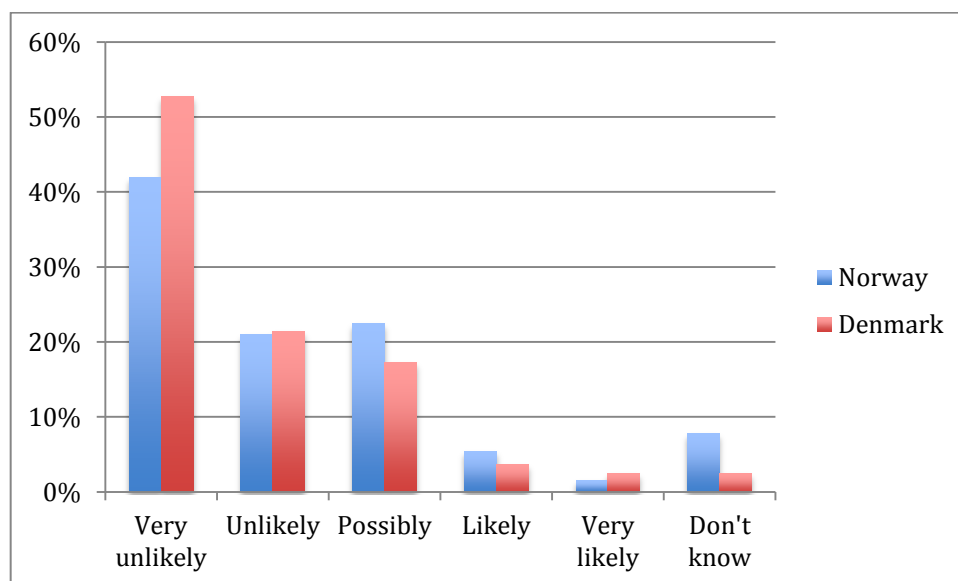
International Survey Results

Through a contact within Michelin's Nordic offices, I have gained access to the survey results of a study they conducted on tire-habits and EVs in 2013. PFM Research conducted the research in April 2013 with a thousand respondents within Denmark, Norway and Sweden. The respondents vary in age, gender and geographical location. Michelin has communicated the conclusions of the survey out publically, but it has

not been used for scientific research. Using this survey as a starting point provides means to draw comparisons that would not have been possible to conduct alone. As discussed in chapter 3, the use of this survey limits myself to Michelin’s construction of the questions, however the responses still prove relevant, as the following discussions will show.

The first question asked regarding citizens’ opinions on EVs was how likely it was for people they would buy an EV as their next car. The results are illustrated in figure 10.

Figure 10: How likely is it that you choose an EV the next time you buy a car?

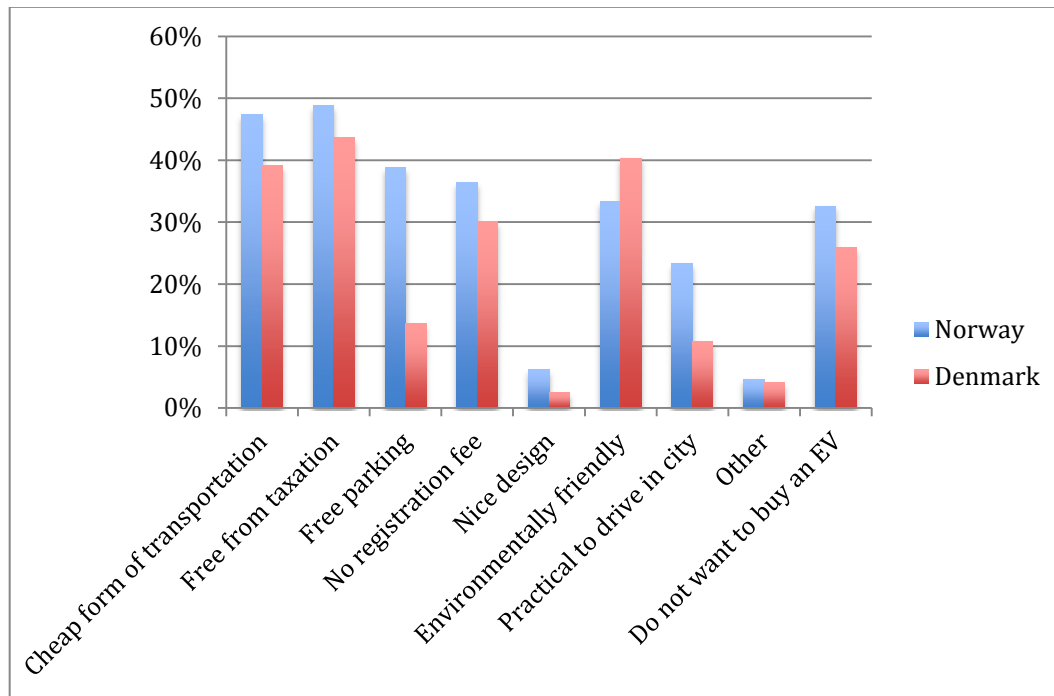


The first thing you notice is that despite Danes having a higher response rate on “very unlikely”, the responses in both countries are very similar. This does seem a bit odd when you think about Norway’s many purchasers of EVs and the limited results in Denmark. Only 6,98 pct. of the Norwegians and 6,17 pct. of the Danes answered either “likely” or “very likely” on buying an EV for as the next car. The results can be interpreted in two different ways:

- 1) Norwegians have reached the maximum capacity of purchasers of EVs, and it is unlikely they will reach the greater majority (this does however not correlate with the results from recent car sales in Norway since the survey was conducted. See chapter 4).
- 2) The Danes say one thing and do another when push comes to shove (possibly referring to the social desirability effect discussed in chapter 3).

When including half of the “possibly” responses, the Norwegian responses actually fit quite nicely with the amount of citizens who have switched to EVs within recent months. The Danish responses are more peculiar, as very limited results have occurred so far. If the 6,17 pct. of citizen respondents actually were to buy an EV, it would represent a major step forward. It could be interpreted as an expression of intentions rather than actual behaviour. As the expected ‘next purchase’ might also be seen as a future action, Danish citizens might base their response on an expected change in economic and political setting. From another perspective, the results could also point towards that Danes are highly interested in purchasing EVs, but remain limited because of other factors. This leads to a discussion of what incentives motivate citizens towards EVs (see figure 11).

Figure 11: What would be your strongest arguments to buy an EV? (Multiple choice)



As this question was a multiple-choice question, the respondents could select as many variables as they liked. This explains the noticeable odd setting with Norway having most responses in all categories except one (“environmentally friendly”). The question is essential as it relates directly to environmental citizenship and the link between attitudes and fiscal incentives and what motivates citizens towards EVs.

The first four possible choices relate to economic incentives, and unsurprisingly Norwegians articulate a greater motivation based on these. The results make sense simply because Norwegians have more economic incentives to choose from, and it seems logical that these have gained more popularity in Norway than they have in Denmark.

It is interesting from the perspective of environmental citizenship that Danes articulate “environmentally friendly” as a greater motivator than Norwegians. The results could indicate that the Norwegian fiscal incentives actually have had a negative impact on citizens’ pro-environmental attitudes. However, it becomes necessary

to understand the context, before jumping to conclusions. The question asked for *strongest* arguments, not listing *all* arguments. “Environmentally friendly” actually comes in second in arguments for Danes, only surpassed by “free from taxation” with 43,62 pct. of the respondents. To compare, “environmentally friendly” is only ranked as the fifth highest argument for Norwegians surpassed by all the economic incentives. It makes sense that Danes are more motivated for environmental reasons than economic ones simply because there are limited economic incentives in Denmark to begin with. So despite this being a perfect opportunity to prove the hypothesis on fiscal incentives negative impact on attitudes, it might be a bit of a stretch based on the available data. The difference in responses on “environmentally friendly” is relatively small, however noticeable, with 33,33 pct. of Norwegians and 40,33 pct. of Danes responding for it as one of their strongest arguments to buy an EV. Based on this data, there is not conclusive evidence to say that Danes are more environmentally conscious than Norwegians.

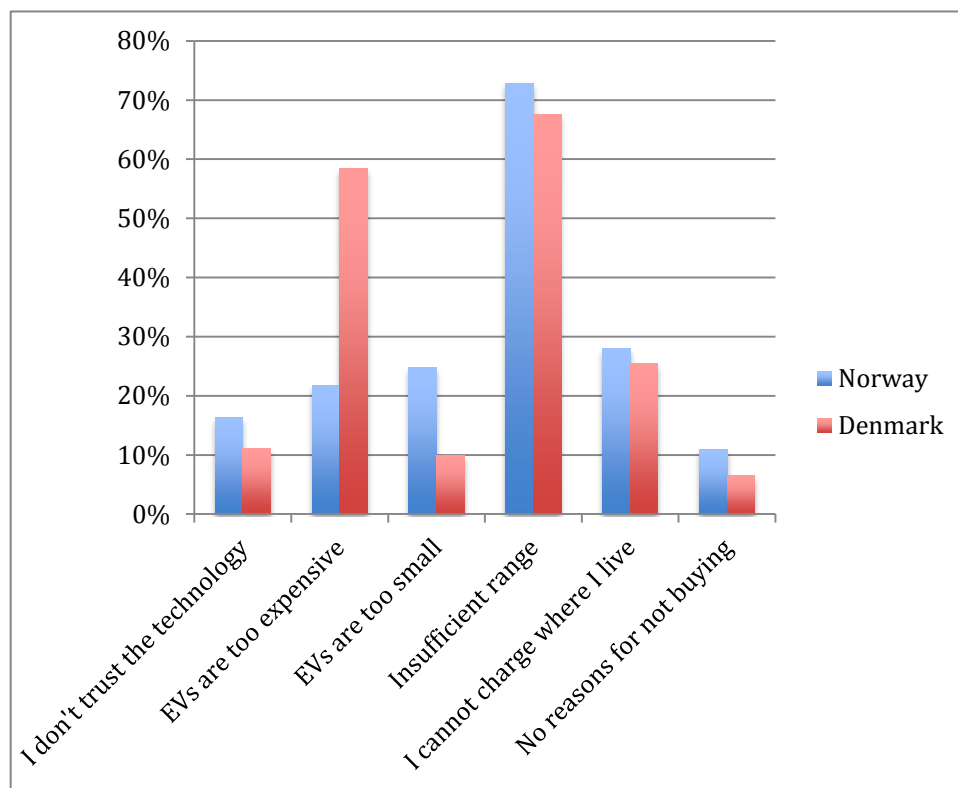
The responses do however point towards that pro-environmental attitudes are not the main cause for behavioural change towards EVs. Specifically addressing environmental citizenship, the interesting question becomes why 40 pct. of the Danes list environmental concerns as one of their strongest arguments to buy an EV with only less than 1 pct. of them buying one. The data indicates that being motivated by environmental concerns is not sufficient to change behaviour towards EVs. Norway is the only one of the two countries with noticeable sales results and here fiscal incentives dominate as the main articulated arguments.

It is interesting to note that the fiscal incentives do seem to replace the environmental arguments for citizens in Norway, which is interesting from an environmental citizenship perspective. If citizens mostly buy EVs for economic reasons, it should from the theoretical perspective represent concerns for the long-term survivability of the product. If EVs can only be successful on the market as long as the car type is capable of economically out-compete regular gasoline car models, it might limit the success of EVs to the effectiveness of government fiscal incentives until the

technological development itself is capable of generating competitive EV models and prices.

Finally it is also worth noticing citizens who respond they “do not want to buy an EV”. The response rate is higher in Norway, which is peculiar with the discussion we have had so far. With over 30 pct. of respondents choosing this option it is interesting to investigate what lies behind people’s motivation to *not* buy an EV. The response could be a result of a formation of an anti-culture towards EVs, or linked to specific limitations to EVs as a product. This is further addressed in figure 12.

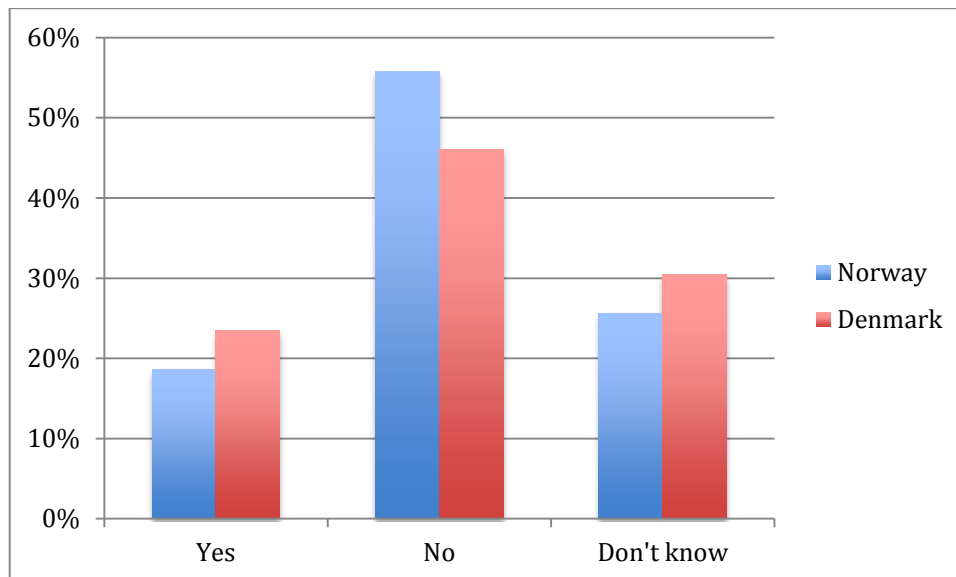
Figure 12: What would be your strongest arguments to *not* buy an EV? (Multiple choice)



The figure illustrates several interesting points. The first thing you notice is the huge gap in responses on “EVs are too expensive”. Danes articulate that they are highly constrained by the expensive car prices. In Norway it is a much smaller concern, which can be linked to the introduction of the fiscal incentives. However, price is neither Danes’ nor Norwegians’ biggest concern regarding EVs. The figure demonstrates that range is the biggest articulated factor for citizens. The concern relates to the car models and not something nation-states specifically can affect. The concern for range does not differ much between Denmark and Norway, and as a result it does not in itself explain why Danes buy fewer cars than Norwegians. In some ways, the result is actually a bit surprising, as Denmark geographically is much smaller than Norway and easier to get around. In this light, range should be a bigger concern for Norwegians, as the survey results also show to some degree. It might also point towards the limited potential for EVs to replace cars in the countryside, as car models for shorter distances might be limited to urban territories.

Figure 13 directly compares the price of an EV with the price of a regular diesel or gasoline car.

Figure 13: Would you buy an EV if it had the same price as a regular gasoline car?



The question is interesting because it refers to the same threshold. Although prices for a regular car might differ in each country, it might be the direct comparison citizens are making when they contemplate whether to buy an EV or not. The responses are also interesting because to some extent the results cover reverse outcomes. For Norwegians, the many incentives mean that the question in some cases is to what extent a citizen would buy an EV if the prices were *raised* to the level of a gasoline car. For Danes, it is about *lowering* the prices. That more Danes would say “yes” or “don’t know” to buy an EV than Norwegians, despite all the technological challenges we have already discussed, and more Norwegians would say ‘no’ than Danes could indicate evidence towards Dobson’s concern on fiscal incentives long-term effect on attitudes. It shows, at least in theory, that more Danes would buy more EVs than Norwegians if the prices were the same. This could either be a result of Norwegians relying heavily on the fiscal incentives as a means for their actions or that range or other technological factors play a larger role in Norwegians’ decisions than they do in Denmark, as the previous figure to some degree highlighted.

A final point to make from this figure is that price might not be as big of a game-changer as we have otherwise given it credit for until now. It is still only the minority of the population that would buy an EV if prices were the same, indicating that price is not the sole reason for people not to get one. This was evident in the discussion of technological limitations and will also be further addressed in the upcoming chapter on technological feasibility.

The following two parts of this chapter will further investigate how the presented results compare to other national surveys on EVs.

Danish National Survey

Based on the international survey, Danish citizens use more arguments on environmental concerns for buying EVs but particularly expressed limitations from an eco-

conomic perspective. These results correspond well with the findings from the national survey from 2011, which in the title concluded that “*Danes are ready for EVs*” (Jensen and Etrons, 2011). Although 2011 is within recent years, it is still worth noting though that a lot of things have happened within this time-span regarding EVs (see chapter 4 on behavioural change). The survey is interesting for two reasons: (1) because citizens have expressed interest in investing in EVs in Denmark since 2011, and (2) because despite this, only very few Danes have actually bought one since then. The study highlighted several useful points, which will be discussed in the following part.

The study showed that typical ‘green’ arguments play a very limited role in the respondents conscious and interest regarding their purchase of an EV. Only 4,5 pct. says that it is important that the EV is more environmental friendly than gasoline or diesel cars. And only 18,7 pct. has the environmental perspective on their top three reasons to buy an EV. The study claims this is remarkable because the EV is launched exactly because of environmental and climate concerns. The study argues that this is likely because there is a lot of economic and functional concerns that need to be in place before Danes are ready to accept the EV, and they expect the ‘softer’ values such as environmental, climate change, design and aesthetics will play a larger role in citizen conscious once these things are in place. According to the study, 84,6 pct. of the respondents place functionality and economy as their top priorities, while 9,4 pct. prioritise identity and lifestyle, and 4,7 pct. on sustainability and environment. The study argues that this is not the same as saying Danes do not care about the environment. It simply means that it is not the most important thing when you are buying expensive, long-lasting goods such as a car.

The results correlate well with the results from the international survey, although the responses seem a bit more negative concerning the role of pro-environmental attitudes for behavioural change. In the Michelin study 40,33 pct. of the Danish respondents answered environmental concerns were one of their strongest arguments for buying an EV, and this is a high number compared to only 18,7 pct.

having the environmental perspective in their top three reasons for buying an EV. This might be a result of limiting the citizens to a ‘top-3’, but the study points towards a more critical stand on the role of pro-environmental attitudes than the previous survey, leaning towards fiscal incentives and infrastructure as the essential driver for behavioural change. This might be a results of the survey being from 2011 with many changes in infrastructure since then, but all in all, it is difficult to point towards a sole catalyst generating behavioural change in Denmark, as only limited results have actually occurred.

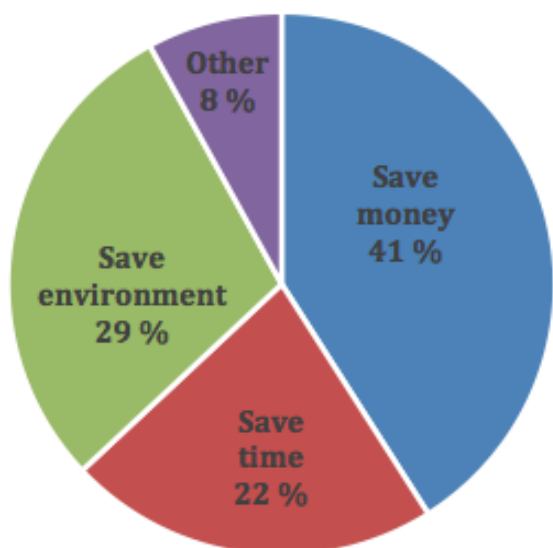
As a final point, the study furthermore shows that there might be an inconsistency in how the Danish respondents address environmental priorities. 59,3 pct. of the respondents value “environment and sustainability” as an important factor in their selection of a car but only 4,7 pct. said that it was important that the car radiates environment and sustainability as first priority for the selection of a future car. The study argues this could be a result of sustainability being viewed from an economic point of view for instance in regards to fuel-efficiency.

Norwegian National Survey

Regarding the Norwegian case, the international survey placed a big emphasis on the implemented fiscal incentives as the main driver for behavioural change. These results are backed up by the national survey from the EVS27 conference in Barcelona, 2013 (Haugneland and Kvisle, 2013). This study asked current EV-owners on their motives and their EV use with 1.858 responses covering over 15 pct. of all EV owners at the current time. Since the study only addresses actual EV owners, the study differs from the previous used ones, as these respondents have already bought into the idea of driving an EV. This should provide a more enthusiastic crowd with a likely more positive self-image of their own behaviour. And since they already bought the car, they must have a positive view on the models.

However asked directly why they bought an EV, the results are rather similar to the international survey conducted by Michelin, as figure 14 shows.

Figure 14: Why did you choose an EV?



(Haugneland and Kvisle, 2013)

The response demonstrates that economic perspectives are still the main driver for citizen behaviour. However, environmental concern is surprisingly high with 29 pct. having this as a first priority. This points in the opposite direction of Dobson's (2009) indications of how fiscal incentives should affect pro-environmental attitudes. At least for a large part of the current purchasers of EVs in Norway, environmental concern has been a major part of their decision to buy an EV despite the many fiscal incentives. An explanation for this could be that the respondents being first-movers with greater ambition and willingness to take risks caused the results (see Rogers' model of diffusion of innovation in chapter 3). Another explanation could be that Norwegians have many economic incentives in place, which leaves room for softer values such as environmental concern to play a bigger role for their citizens, as previ-

ously discussed. A more critical stance towards environmental citizenship would oppositely argue that these numbers show that citizens do understand the underlying rationale of the fiscal incentives in both Denmark and Norway, but regardless of them being in place or not, the pro-environmental attitudes are not enough alone to promote behavioural change, as a comparison with the Danish results would indicate.

All in all, it is technically not possible to conclude whether the fiscal incentives have had a negative impact on the pro-environmental attitudes in Norway without a historical overview of how attitudes have changed over time. However, status quo points towards that citizens who are interested in buying an EV are motivated by economical and practical reasons for their behaviour, and to a lesser degree motivated by environmental responsibility and a sense of morale and justice, as environmental citizenship would argue for long-term behavioural change.

Conclusion

Based on the above the discussions, the two countries have been categorised as demonstrated below. The categorisation both highlights the availability of pro-environmental attitudes towards EVs in Denmark and Norway, while emphasising fiscal incentives as the articulated main driver for behavioural change in both countries.

Country	Level of pro-environmental attitudes	Main incentive or disincentive
Norway	Similar	Fiscal incentives
Denmark		Fiscal incentives

With this categorisation it indicates that pro-environmental attitudes towards EVs are not as crucial as the theoretical hypotheses originally believed. Both Danes and Norwegians place a greater emphasis on fiscal incentives as their main incentive or ob-

stacle for buying EVs, despite both countries addressing environmental concerns as an incentive.

Although Dobson would argue that fiscal incentives lead to a negative impact on pro-environmental attitudes, it would be a stretch to say Danes are more environmentally conscious than Norwegians based on the available data. Although the international survey highlighted that the Danish respondents were marginally more motivated by environmental concerns, the discussions concluded that the difference is more likely a result of different contexts of the respondents, which was further emphasised by the national survey results. Danish residents might highlight environmental concern and put less of an emphasis on fiscal incentives, but this is most likely a result of the exact lack of fiscal incentives in place to begin with. Another explanation could be that the presence of fiscal incentives allows Norwegians to afford popular opinions such as emphasising environmental incentives since the economy is no longer a concern. It is however evident that citizens in both Denmark and Norway place greater emphasis on fiscal incentives for either their actions or non-actions. To further test whether the fiscal incentives actually have had a negative impact on the Norwegian pro-environmental attitudes requires further studies with several tests over an extended time-period.

I cannot say from this analysis that environmental citizenship is not a successful way of promoting long-term pro-environmental behaviour. The data does however point towards that pro-environmental attitudes are not alone capable of generating behavioural change towards EVs. In both Denmark and Norway, citizens are using arguments on economy and practicality as the main arguments for their behaviour or non-behaviour. Dobson might be right in that fiscal incentives first of all have potential to generate short-term behavioural change, but the results point towards that the fiscal incentives are necessary to facilitate long-term change as well, particularly regarding expensive investments such as EVs.

7. Condition Variable: Technical Feasibility

We now have an overview of to what extent behaviour has actually been changed, what fiscal incentives are in place and how these correlate with citizens' attitudes towards EVs. In relation to Dobson's (2009) original approach this would be sufficient to investigate pro-environmental behaviour. Dobson's (2009) emphasis on the necessity for sufficient infrastructure, however, is in line with other theoretical approaches (Kingdon, 2011, Wooten, 2005) and makes sense to add as a technical condition variable in a research study of EVs. Beyond attempting to convey citizens to buy alternative fuel-driven vehicles, there are questions regarding the limitations of cars capabilities and infrastructure, which was exemplified in the previously discussed surveys. This chapter will address these concerns by introducing the theoretical concept of *automobility*. The chapter serves the purpose of critiquing environmental citizenship through the context of automobility and discussing EVs potential to reach the greater public majority of citizens.

The Theoretical Discussion of Automobility

Overall, automobility can be seen as an intrinsic element in our everyday life that represents power, mobility and freedom (Elliott and Urry, 2010, Urry, 2005, Freudendal-Pedersen, 2009, Paterson, 2007). Paterson (2007, 2009) discusses the uniqueness of cars. He argues that cars are a central element in both our economic and cultural society today. To attempt to 'green' the car system entails dramatic changes in our cultures of consumption and mobility. He sees two approaches: To attempt to 'green' the car itself or by overcoming automobile dependence (Paterson, 2007, Paterson, 2009). In the case of EVs, he would view this as an attempt of "greening the car" rather than dramatically changing the entire transportation sector, as introducing EVs ultimately represent an attempt to replace traditional gasoline or diesel cars with a similar product albeit it entails modifications to infrastructure and

charging systems. This would indicate that EVs technically would be an easier type of product to change behaviours and attitudes towards. However, Paterson goes as far as arguing that “greening the car” is highly problematic and likely impossible. In his view, to move towards sustainable social and political forms represent a significant downgrading of the economic, political and cultural importance of cars. There is simply a limited amount of ‘technological fixes’, which proves alternative solutions to be insufficient in the face of the growing demand and use of cars (Paterson, 2007). In other words, EVs should have a tough time gaining momentum as they ultimately represent as technological downgrade from gasoline and diesel cars, as EVs are incapable of equalling modern demands for mobility and price. This is a valid argument, but Paterson’s argumentation falls short of explaining how to explain the Norwegian success and the international differentiations.

Another major discussion concerning the topic of automobility revolves around the freedom that it entails. The mobility culture can be seen to represent freedom, wealth and privilege. Freudendal-Pedersen argues that daily life practices of mobility creates ‘structured stories’ that link increased mobility to increased freedom, which justifies the continuous use of cars (Sheller, 2011, Freudendal-Pedersen, 2009). In this light the limited transition to EVs could also be seen from a citizen perspective, as a demand for increased mobility and freedom or oppositely a refusal of letting acquired freedom of movement go. The concern for the limited range of EVs could in this light be seen as an expression of citizens struggling with the idea of moving less and slower in the increasingly connected world.

A third perspective comes from Urry (2005) who argues that an automobility system comprises of six components that in their combination generate and reproduce the ‘specific character of domination’ that it exercises. According to Urry (2005), automobility is:

1. The quintessential *manufactured object* produced by the leading industrial sectors and the iconic firms within 20th-century capitalism.

2. The major item of *individual consumption* after housing, which provides status to its owner/user through its sign-values.
3. An extraordinarily powerful *complex* constituted through technical and social interlinkages with other industries.
4. The predominant global form of ‘quasi-private’ *mobility* that subordinates other mobilities of walking, cycling, traveling by rail and so on.
5. The dominant *culture* that sustains major discourses of what constitutes the good life.
6. The single most important cause of *environmental resource-use*. This results from the scale of material, space and power used in the manufacture of cars, roads and car-only environments.

(Urry, 2005)

The list highlights that it is not the car itself that is central but these fluid interconnections that create and reproduce the dominant system of automobility.

Critique of Environmental Citizenship

Based on these discussions, environmental citizenship can be critiqued based on the main differences between automobility and other traditional types of pro-environmental behaviour that was presented in the chapter 2. There are key differences between encouraging the reuse of plastic bags and bigger and technical investments such as buying an EV. Based on the previous chapters and the concept of automobility, there are mainly two differences worth highlighting in this context:

1. The EV represents a substantial economic cost. The discussion of automobility would indicate that it is not enough simply to convince people to buy the product. They also need to be able to afford it and see it as a good investment.

2. Based on the same critique, the EV does not fit well into the idea of globalisation and continuous increased mobility, as EV have limited range and extended requirements for charging.

In other words, EVs might be technically feasible to push onto the market, but the car type contains several cultural and economic obstacles for further scaling.

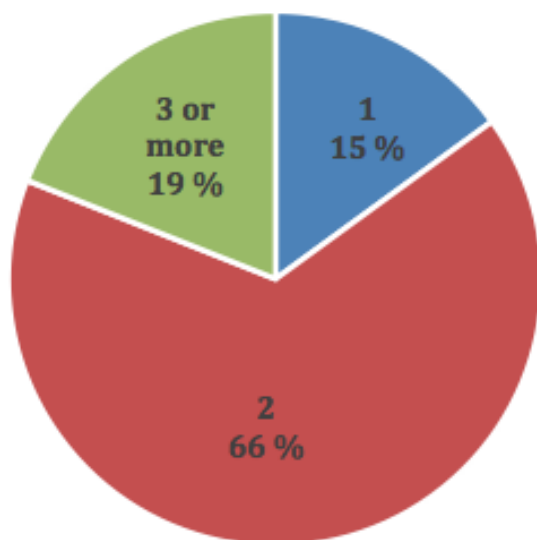
In the following part of this chapter, I will discuss how these perspectives relate to the Norwegian and Danish cases by incorporating results from Haugneland and Kvisle's (2013) survey results on the technical aspects of owning an EV.

Technical Constraints

From the theoretical point of view of automobility, several interesting aspects can be identified within the case study of EVs in Norway and Denmark. For instance, a Danish case study where citizens were allowed to borrow an EV for an extended period of time concluded that respondents expressed a greater concern than before about the ability to maintain their present mobility with an EV after the test period had ended (Jensen et al., 2014). This type of concern could foster doubt whether or not citizens see EVs as a full replacement of their regular car because of the technical limitations and the visions of freedom of mobility despite previous studies have shown that EVs is fully capable of living up to everyday travelling for most citizens. A study in Denmark showed that 97 pct. of the Danes' car trips could be completed with an EV (Godske, 2014) . It points towards it being more the idea of freedom of mobility than the actual practical everyday life that discourages citizens from EVs.

The argument is backed up by the Norwegian survey results. EV owners tend to own more than one car as figure 15 shows.

Figure 15: Number of cars in household among Norwegian EV drivers



(Haugneland and Kvisle, 2013)

The survey shows that most EV-drivers in Norway actually own two cars with 66 pct. of the respondents. This study points towards that despite increasingly many Norwegians are buying EVs, citizens are not willing to fully let go and make a full switch, and it raises questions whether you truly are able to say that the case study demonstrate pro-environmental behaviour. After all, it does not represent pro-environmental behaviour to produce and promote more cars onto the roads, as this, using Paterson's terms (2007) both fails to (1) 'green the car' as the car in itself has not been replaced but rather accompanied by EVs and (2) it does not in any ways represent a switch away from the dependency of automobiles.

Conflictingly enough, the same survey however also highlighted that most Norwegian EV drivers see EVs as a full replacement of a traditional car. The study shows that approximately 90 pct. of the Norwegian respondents identify EVs as 'completely' or to a 'high degree' replaces traditional cars (Haugneland and Kvisle, 2013). This points in the opposite direction of citizens seeing EVs purely as a com-

plementary car. The results indicate one of two things: Either citizens view EVs as a full replacement but maintain a traditional car to keep freedom of mobility (in line with the theoretical discussions of automobility) or citizens maintain two cars for other reason such as practicality, wealth or a mix of the two.

Finally, the same survey also addresses what citizens articulate is necessary to further scale EVs in Norway. The two top arguments are ‘longer range’, as we have previously discussed, and ‘predictable EV policy’. ‘Lower prices’ are actually the third lowest priorities behind ‘more parking lots’, ‘more fast chargers’ and ‘more models’, but to this it is important to keep in mind, that the Norwegian prices are already substantially lower than in other countries, which might bias the responses. In some ways requesting predictable EV policy is however also relating to EV prices, as the fiscal incentives that have gained broad popularity in the Norwegian market are policy-driven and as mentioned might expire in 2017 (Merrill, 2014). A request for predicable EV-policies can thus be seen as a request for a guarantee that prices will remain low.

Conclusion

By introducing automobility as a theoretical concept both sheds new light on EVs technical feasibility and provides a theoretical critique of environmental citizenship. The context of cars differs from other types of pro-environmental behaviour previously examined within environmental citizenship because it represents a significant cost while interfering with citizens’ freedom of mobility. The discussion indicates that in order to gain access to the early majority of citizens (see Rogers’ figure 4) and beyond, EVs need to become more technical feasible at competitive prices.

8. Discussion of the Results

The analysis draws a clear picture of fiscal incentives being the main driver for behavioural change towards EVs. The respondents in the used surveys have expressed pro-environmental attitudes towards EVs in similar fashion as discussed within environmental citizenship. However, the results demonstrate a different relationship between the independent variables than was otherwise expected in the theoretical framework (see figure 3). Compiling the results from the completed analysis provides an overview of the research as exemplified below.

Country	Behavioural change	Fiscal Incentives	Level of pro-environmental attitudes	Main incentive or disincentive
Denmark	Innovators	Below average	Similar	Fiscal incentives
Norway	Early adopters	Top incentives		Fiscal incentives

The noticeable difference between the two cases is that the fiscal incentives seem to be the main driver for behavioural change towards EVs. Although this result is not surprising it still presents a challenge to the theoretical framework of environmental citizenship on how to understand the relationship between the independent variables and how to generate long-term results.

When looking at attitudes from an environmental citizenship standpoint, the most interesting point about the results is not the positive results in Norway, but rather the lack of results in Denmark. When comparing the results from each variable, it stands out that the pro-environmental attitudes in Denmark have only created limited results within first-mover groupings with no indication that this will change any

time soon without the aid of fiscal incentives. The Danish results demonstrate that pro-environmental attitudes towards EVs are not capable alone to generate behavioural change towards EVs. Not even long-term as environmental citizenship otherwise would argue. Although there has been a steady rise in sales in Denmark, EVs still only account for less than 1 pct. of the total sales, and it does not seem to change until either the prices drop or fiscal incentives are implemented.

A contradictory explanation that supports environmental citizenship could be that the pro-environmental attitudes in Denmark and Norway are in fact not equally high but equally low and need further stimulation to generate results. If this were the case then expecting to reach a sufficient level of pro-environmental attitudes might be unachievable, making attitudes even more irrelevant as an independent variable.

To specifically address the research question on to what extent attitudes are capable of generating pro-environmental behaviour towards EVs, the short answer is that attitudes matter to a very limited extent. It may be a stretch to argue that they do not matter at all based on this study, because of the limited knowledge of what would happen if they were not present. Although fiscal incentives are considered the determining factor for behavioural change, it would appear unlikely the fiscal incentives had been implemented to begin with without the presence of pro-environmental attitudes, as promoting EVs in this scenario makes limited sense. However, the study shows that attitudes are insufficient to drive a significant push for behavioural change towards EVs. While educating and inspiring citizens to act in greener ways is important, governments simply cannot ignore fiscal incentives if they want to push costly pro-environmental behaviour (similar to EVs) forward.

Where environmental citizenship forms a relevant critique of fiscal incentives is relating to the long-term perspective of pro-environmental behaviour. As the analysis has shown, even Norway still has some ground to cover before reaching the broader population of car users. Dobson (2009) would argue that the use of fiscal incentives as the main driver for behavioural change would result in negative impacts on attitudes and long-term behaviour. Although attitudes have failed to generate re-

sults on its own in Denmark, the use of fiscal incentives in Norway could potentially impact the ultimate goal of creating long-term pro-environmental behaviour in a negative way from the theoretical perspective. As what is meant by 'long-term' is blurry at best, it might be too early to decisively conclude anything on this. The environmental citizenship critique of using fiscal incentives as the main driver for change is that citizens will not respond to the underlying rationale of the incentive and instead base their actions solely on economic factors. Bjart Holtmark, a Norwegian economist at the Norwegian government statistics bureau, says it well:

"If the goal of the EV policy is to have many EVs on the street, the Norwegian policy is a success. However, it is a basic misunderstanding that increasing the number of EVs is a goal by itself. We do not know to what extent the many EVs in Norway have replaced traditional cars. If the EVs to a large extent have come in addition, the result is higher CO2 emissions, not lower."
(Merrill, 2014)

The quote fits in well with environmental citizenship thinking. If citizens are driven solely because of external and economic factors, it means the citizens are not environmentally conscious. They will be motivated purely by fiscal incentives and the pro-environmental behaviour only exists as long as the incentives do. The critique is relevant, but the main follow-up question becomes, how to generate long-term pro-environmental behaviour if neither fiscal incentives nor changing attitudes work. As this study has shown, fiscal incentives are crucial in generating a momentum. However how to generate a long-term push while maintaining pro-environmental conscious citizens requires further research. Indications from this study are that there is a need for focusing on *both* changing attitudes *and* creating momentum using fiscal incentives. To generate further success it also becomes necessary to address technical feasibility to make the EV more competitive while also rethinking how the setup affects citizens from the perspectives of automobility and freedom of mobility. The

analysis showed that it is still only the minority of the population that would buy an EV today in both countries, and surveys showed that it would be the same results if EV-prices were the same as regular gasoline cars. This indicates that focusing solely on price will not be sufficient in generating long-term results, as a substantial critique of the used theoretical framework.

Conclusions

This research study aimed to test the theoretical perspectives of environmental citizenship in an attempt to shed more light on how to generate pro-environmental behaviour in the context of EVs in Norway and Denmark. The paper wanted to test the theoretical link between the independent variables of fiscal incentives and attitudes and how their correlation might affect the dependent variable of pro-environmental behaviour. The thesis overall has concluded two main points based on the cases and the available data:

1. Attitudes alone are not capable of generating pro-environmental behaviour towards EVs. Based on the available data, it is not possible to conclusively say that attitudes do not matter at all, but the results in Denmark indicate the need for fiscal incentives to foster behavioural change.
2. Fiscal incentives are a necessary policy tool for generating both short- and long-term results at least as long as EVs are incapable of generating competitive prices and fully replacing gasoline and diesel cars' technical attributes.

The results differ from environmental citizenship as the theory proscribes that fiscal incentives are only useful for generating short-term behavioural change. For long-term pro-environmental behaviour, the theory argues that the focus should be on changing attitudes (see chapter 2). Despite this being a valid argument for inspiring citizens to become environmentally conscious consumers, the same direct link between the independent variables could not be relocated in the context of EVs in Denmark and Norway. Opposite the phrased theoretical hypotheses, attitudes were not identified as capable of creating long-term behavioural change towards EVs and the analysis did not register a significant drop in pro-environmental attitudes in Norway, as the fiscal incentives otherwise should have resulted in, according to environmental

citizenship and the theoretical hypotheses. However, as the EV-sales are relatively new starting in 2010, the long-term effects are still to be evaluated.

The analysis indicates that for more expensive types of pro-environmental behaviour, fiscal incentives become essential for both initiating and maintaining pro-environmental behaviour. This conclusion indicates that the discussions and on-going theoretical work on pro-environmental behaviour need to differentiate the types of behaviour in question. Especially when distinguishing between expensive forms of behaviour such as buying EVs and other inexpensive practices. There are multiple factors in play within the context of every type of behaviour and buying an EV is a very different practice than sorting garbage as an example. Technical aspects, as presented in chapter 7, demonstrate how the context of the case might affect the outcomes.

Based on the above statements, it is evident that more research is needed for evaluating pro-environmental behaviour. Especially when it comes to understanding different types of behaviour with multiple variables such as recycling, waste management, mobility, energy usage etc. Further recommended studies include micro-qualitative studies of what motivates citizens and changes attitudes and policy-driven analyses of how the fiscal incentives are developed, combined with larger scale quantitative analyses of the EV-market to see how other countries' attitudes and behaviour compare to the Scandinavian.

Validity of Conclusions

The completed research study can be critiqued from various angles. I have identified two overall points, which should conclusively be raised: (1) The biggest critique should be targeted at the use of empirical data. By being dependent on secondary data leaves concerns for both how the data was collected and limits the ability to gain deeper insights into environmental citizenship. The identified surveys only provide a glimpse of citizens' motivations and fail to provide a full overview of to what extent citizens subscribe to values within environmental citizenship. As Adcock and Collier (2001) state, valid measurement is when the scores of the indicators meaningfully capture the ideas the identified concept consists of, and in this regard questions arise whether the used data fully captures pro-environmental attitudes, as citizens are also answering within different context of politics, economy and geography (Adcock and Collier, 2001, Melhuus, 2002). The used empirical data limits the theoretical contributions of this study. (2) Building on this, the empirical critique also creates questions on the study's generalizability. The study maintains a holistic approach and only to a limited degree goes into detail with national infrastructure, policy frameworks and citizen characteristics of whom, where and how they use EVs. The sole nature of this study only comparing Scandinavian countries raises concerns on how the results can relate to other contexts.

Despite these raised concerns, the project delivers both relevance and substance for the on-going discussions of pro-environmental behaviour and environmental citizenship. The study invites environmental citizenship into new arenas and illustrates key issues that should be discussed and further examined for how to stimulate pro-environmental behaviour. This is particularly relevant for studies that involve economic expenses or conflicts with citizens' everyday life or ideals, similar to studies of automobility. The research calls for more complex approaches that take both the context and the case into account. In doing so, it creates space for future studies to investigate.

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Appendix 1: Michelin survey 12 April 2013, Norway

Q1: Hvor sannsynlig er det at du velger en elbil neste gang du kjøper bil?												
	Total	Er du.....		Hva er din alder?				Hvilken region bor du i?				
		Mann	Kvinne	18-29 år	30-45 år	46-60 år	61-74 år	Nord-Norge (Finnmark, Nordland, Troms)	Trøndelag (Nord-Trøndelag og Sør-Trøndelag)	Oslo (Akershus)	Østlandet (Buskerud, Hedmark, Oppland, Telemark, Vestfold, Østfold)	Vestlandet (Hordaland, Møre og Romsdal, Rogaland, Sogn og Fjordane)
Antal	1000	736	264	70	271	202	457	70	85	240	333	233
Svært sannsynlig	1.55%	1.05%	2.94%	-	2.86%	3.85%	-	-	9.09%	-	2.33%	-
Ganske sannsynlig	5.43%	4.21%	8.82%	11.11%	2.86%	15.38%	1.69%	11.11%	-	6.45%	2.33%	6.67%
Det er mulig	22.48%	23.16%	20.59%	22.22%	22.86%	34.62%	16.95%	-	27.27%	29.03%	20.93%	16.67%
Ganske usannsynlig	20.93%	22.11%	17.65%	-	25.71%	11.54%	25.42%	11.11%	18.18%	19.35%	23.26%	26.67%
Svært usannsynlig	41.86%	45.26%	32.35%	55.56%	40.00%	30.77%	45.76%	55.56%	45.45%	32.26%	48.84%	43.33%
Vet ikke	7.75%	4.21%	17.65%	11.11%	5.71%	3.85%	10.17%	22.22%	-	12.90%	2.33%	6.67%
	2.0	1.9	2.2	1.9	2.0	2.5	1.7	1.6	2.1	2.1	1.8	1.9

Q2: Hva ville være dine primære grunner til å kjøpe elbil? Flere svar er mulig												
	Total	Er du.....		Hva er din alder?				Hvilken region bor du i?				
		Mann	Kvinne	18-29 år	30-45 år	46-60 år	61-74 år	Nord-Norge (Finnmark, Nordland, Troms)	Trøndelag (Nord-Trøndelag og Sør-Trøndelag)	Oslo (Akershus)	Østlandet (Buskerud, Hedmark, Oppland, Telemark, Vestfold, Østfold)	Vestlandet (Hordaland, Møre og Romsdal, Rogaland, Sogn og Fjordane)
Antal	1000	736	264	70	271	202	457	70	85	240	333	233
Billig drivstoff	47.29%	50.53%	38.24%	44.44%	57.14%	57.69%	37.29%	33.33%	72.73%	41.94%	48.84%	43.33%
Fri fra gebyr og skatter	48.84%	50.53%	44.12%	44.44%	57.14%	50.00%	44.07%	33.33%	72.73%	48.39%	44.19%	46.67%
Fri parkering	38.76%	38.95%	38.24%	33.33%	51.43%	34.62%	33.90%	33.33%	54.55%	41.94%	30.23%	36.67%
Slippe tollavgifter	36.43%	35.79%	38.24%	33.33%	45.71%	34.62%	32.20%	22.22%	54.55%	32.26%	32.56%	40.00%
Fin design	6.20%	7.37%	2.94%	-	11.43%	3.85%	5.08%	-	9.09%	9.68%	-	10.00%
Miljøsmart	33.33%	28.42%	47.06%	11.11%	40.00%	46.15%	27.12%	22.22%	45.45%	41.94%	20.93%	33.33%
Praktisk å kjøre med i byen	23.26%	24.21%	20.59%	33.33%	25.71%	30.77%	16.95%	22.22%	45.45%	19.35%	16.28%	20.00%
Annet	4.65%	5.26%	2.94%	-	5.71%	-	6.78%	11.11%	9.09%	9.68%	2.33%	-
Ønsker ikke kjøpe elbil	32.56%	32.63%	32.35%	55.56%	25.71%	15.38%	40.68%	66.67%	9.09%	25.81%	39.53%	33.33%

Q3: Hva ville være de viktigste grunnene til at du ikke ville kjøpe elbil? Flere svar er mulig												
	Total	Er du.....		Hva er din alder?				Hvilken region bor du i?				
		Mann	Kvinne	18-29 år	30-45 år	46-60 år	61-74 år	Nord-Norge (Finnmark, Nordland, Troms)	Trøndelag (Nord-Trøndelag og Sør-Trøndelag)	Oslo (Akershus)	Østlandet (Buskerud, Hedmark, Oppland, Telemark, Vestfold, Østfold)	Vestlandet (Hordaland, Møre og Romsdal, Rogaland, Sogn og Fjordane)
Antal	1000	736	264	70	271	202	457	70	85	240	333	233
Jeg stoler ikke på teknikken	16.28%	16.84%	14.71%	22.22%	25.71%	7.69%	13.56%	11.11%	-	19.35%	16.28%	20.00%
Elbil er for dyrt	21.71%	25.26%	11.76%	22.22%	28.57%	26.92%	15.25%	-	36.36%	32.26%	20.93%	16.67%
Elbilar er for små	24.81%	22.11%	32.35%	33.33%	34.29%	15.38%	22.03%	22.22%	18.18%	32.26%	20.93%	26.67%
Elbiler kan ikke kjøre langt eller til utilgjengelige steder	72.87%	71.58%	76.47%	55.56%	62.86%	73.08%	81.36%	77.78%	81.82%	74.19%	74.42%	66.67%
Jeg kan ikke lade bilen der jeg bor	27.91%	26.32%	32.35%	22.22%	25.71%	15.38%	35.59%	11.11%	36.36%	35.48%	23.26%	30.00%
Det finnes ingen grunn til ikke å kjøpe elbil	10.85%	12.63%	5.88%	33.33%	8.57%	7.69%	10.17%	22.22%	9.09%	12.90%	4.65%	10.00%

Q4: Ville du velge en elbil om den hadde samme pris som en bensinbil?												
		Er du.....		Hva er din alder?				Hvilken region bor du i?				
		Total	Mann	Kvinne	18-29 år	30-45 år	46-60 år	61-74 år	Nord-Norge (Finnmark, Nordland, Troms)	Trøndelag (Nord-Trøndelag og Sør-Trøndelag)	Oslo (Akershus)	Østlandet (Buskerud, Hedmark, Oppland, Telemark, Vestfold, Østfold)
Antal	1000	736	264	70	271	202	457	70	85	240	333	233
Ja	18.60%	20.00%	14.71%	11.11%	20.00%	30.77%	13.56%	11.11%	9.09%	19.35%	18.60%	26.67%
Nei	55.81%	55.79%	55.88%	66.67%	60.00%	42.31%	57.63%	44.44%	72.73%	67.74%	53.49%	50.00%
Vet ikke	25.58%	24.21%	29.41%	22.22%	20.00%	26.92%	28.81%	44.44%	18.18%	12.90%	27.91%	23.33%

Appendix 2: Michelin survey 12 April 2013, Denmark

Q1: Hvor sandsynligt er det at du vælger en elbil næste gang du køber bil?												
	Er du...			Hvad er din alder?				Angiv den region du bor i				
	Total	Mand	Kvinde	18-29 år	30-45 år	46-60 år	61-74 år	Nordjylland	Midtjylland	Syddanmark	Hovedstaden	Sjælland
Antal	1000	572	428	29	169	449	354	132	193	255	243	177
Meget usandsynligt	52.67%	48.92%	57.69%	28.57%	48.78%	44.95%	66.28%	50.00%	57.45%	56.45%	45.76%	53.49%
Ganske usandsynligt	21.40%	23.02%	19.23%	-	26.83%	27.52%	12.79%	31.25%	21.28%	16.13%	27.12%	13.95%
Hverken eller	17.28%	17.99%	16.35%	71.43%	19.51%	15.60%	13.95%	18.75%	4.26%	20.97%	16.95%	25.58%
Ganske sandsynligt	3.70%	5.04%	1.92%	-	2.44%	6.42%	1.16%	-	4.26%	1.61%	6.78%	4.65%
Meget sandsynligt	2.47%	3.60%	0.96%	-	-	2.75%	3.49%	-	4.26%	3.23%	3.39%	-
Ved ikke	2.47%	1.44%	3.85%	-	2.44%	2.75%	2.33%	-	8.51%	1.61%	-	2.33%
	1.8	1.9	1.6	2.4	1.7	1.9	1.6	1.7	1.7	1.8	1.9	1.8

Q2: Hvad ville være dine stærkeste argumenter at købe en elbil? Flere svarmuligheder												
	Er du...			Hvad er din alder?				Angiv den region du bor i				
	Total	Mand	Kvinde	18-29 år	30-45 år	46-60 år	61-74 år	Nordjylland	Midtjylland	Syddanmark	Hovedstaden	Sjælland
Antal	1000	572	428	29	169	449	354	132	193	255	243	177
Billigt drivmiddel	39.09%	36.69%	42.31%	71.43%	41.46%	44.95%	27.91%	37.50%	48.94%	35.48%	38.98%	34.88%

Fri fra afgifter og skat	43.62%	47.48%	38.46%	71.43%	46.34%	47.71%	34.88%	34.38%	42.55%	45.16%	50.85%	39.53%
Fri parkering	13.58%	15.11%	11.54%	28.57%	19.51%	10.09%	13.95%	6.25%	14.89%	8.06%	22.03%	13.95%
Slippe for registreringsafgift	30.04%	35.97%	22.12%	42.86%	31.71%	32.11%	25.58%	31.25%	19.15%	29.03%	35.59%	34.88%
Smuk design	2.47%	4.32%	-	14.29%	-	2.75%	2.33%	3.12%	-	1.61%	5.08%	2.33%
Miljøvenlig	40.33%	38.13%	43.27%	42.86%	41.46%	47.71%	30.23%	34.38%	44.68%	38.71%	42.37%	39.53%
Praktisk at køre med i byen	10.70%	13.67%	6.73%	28.57%	7.32%	8.26%	13.95%	12.50%	14.89%	8.06%	8.47%	11.63%
Andet	4.12%	5.76%	1.92%	-	2.44%	3.67%	5.81%	6.25%	2.13%	3.23%	8.47%	-
Vil ikke købe en elbil	25.93%	23.02%	29.81%	-	14.63%	22.94%	37.21%	28.12%	23.40%	29.03%	22.03%	27.91%

Q3: Hvad ville være dine stærkeste argumenter at ikke købe en elbil? Flere svarmuligheder												
	Er du...			Hvad er din alder?				Angiv den region du bor i				
	Total	Mand	Kvinde	18-29 år	30-45 år	46-60 år	61-74 år	Nordjylland	Midtjylland	Syddanmark	Hovedstaden	Sjælland
Antal	1000	572	428	29	169	449	354	132	193	255	243	177
Jeg stoler ikke på teknikken	11.11%	11.51%	10.58%	-	4.88%	11.93%	13.95%	12.50%	8.51%	12.90%	8.47%	13.95%
Elbil er for dyre	58.44%	63.31%	51.92%	71.43%	51.22%	62.39%	55.81%	62.50%	59.57%	62.90%	55.93%	51.16%
Elbiler er for små	9.88%	6.47%	14.42%	14.29%	12.20%	11.01%	6.98%	18.75%	8.51%	9.68%	5.08%	11.63%
Elbiler kan ikke køre langt nok på en opladning	67.49%	71.22%	62.50%	100.00%	58.54%	71.56%	63.95%	50.00%	68.09%	70.97%	67.80%	74.42%
Jeg kan ikke oplade bilen hvor jeg bor	25.51%	23.02%	28.85%	42.86%	24.39%	26.61%	23.26%	28.12%	21.28%	22.58%	32.20%	23.26%
Der er ingen grund til at ikke købe elbil	6.58%	5.04%	8.65%	-	9.76%	3.67%	9.30%	9.37%	8.51%	3.23%	6.78%	6.98%

Q4: Ville du vælge en elbil hvis den kostede lige så meget i indkøb som en almindelig diesel- eller benzinbil?												
	Er du...			Hvad er din alder?				Angiv den region du bor i				
	Total	Mand	Kvinde	18-29 år	30-45 år	46-60 år	61-74 år	Nordjylland	Midtjylland	Syddanmark	Hovedstaden	Sjælland
Antal	1000	572	428	29	169	449	354	132	193	255	243	177
Ja	23.46%	27.34%	18.27%	28.57%	24.39%	24.77%	20.93%	25.00%	14.89%	30.65%	28.81%	13.95%
Nej	46.09%	48.20%	43.27%	42.86%	43.90%	44.04%	50.00%	53.12%	59.57%	40.32%	44.07%	37.21%
Ved ikke	30.45%	24.46%	38.46%	28.57%	31.71%	31.19%	29.07%	21.88%	25.53%	29.03%	27.12%	48.84%