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Master Thesis

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The Co-evolution in the Norwegian EV Market

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Abstract

Norway has a comprehensive EV incentive program that has shaped the growth in the Norwegian EV market. Co-evolutionary outcomes, such as aggregated volume, modern EV technology and innovation can bring great success, but can also lead to challenges. The incentives were always meant to be temporarily and will eventually be revised and adjusted to the market development by the Norwegian government. How will the interaction between regulatory change and technological change be? Co-evolutionary studies have recently begun to refer to the political processes that might be involved where co-evolution appears. Co-evolutionary theory suggests that firms co-evolve with the environment. The researcher wants to look closer at the co-evolution of firms' and institutions' strategies and the potential outcomes that comes from this interaction consequentially by examining the co-evolution in the Norwegian EV market. The study is based on co-evolutionary theory where the interaction between car manufacturers and the Norwegian government in the Norwegian EV market are being carefully examined.

The distinctive purpose of using a multiple case study approach is to provide better insight that can contribute to the theory building. The case is intended to show causes of rapid changes that can result in great uncertainty for the future EV market in Norway. There are few studies conducted on this topic, and most of the co-evolution studies that have been done have concentrated on emerging economies and not on a developed economy such as Norway. The findings of this qualitative paper contribute to the theory by illustrating how multinational enterprises (car manufacturers) relate to the uncertainty caused by a change in institutional regulations (Norwegian government regulations) and how these institutions can affect MNEs' strategies and vice versa. The paper concludes with suggestions for further research and implications.

1. Introduction

The Norwegian government and international car manufacturers have "worked together" in order to push and drive innovation and electric vehicle (EV) technology development, resulting in one of the most advanced EV markets in the world. Norway's massive turnaround operation to electrify the transportation sector is triggering a comprehensive innovation with the new EVs in almost all sectors of transport. Norway went from early movers to early mass market and is often referred to as the world's EV capital (NEVA, 2015). In 2015, it was registered 50.000 battery electric vehicles (BEVs) in Norway, which is a major increase from year 2010, when the EV market started to get serious with 3.347 registered BEVs. Already the year after, in December 2016, the milestone of 100.000 registered BEVs was reached. Today, Norway is the biggest country in the world when it comes to the number of BEVs per capita.

Governments all over the world tries to support the transition to electric mobility. Currently, the market structure benefits conventional cars and consumers are not quite familiar with EVs and the technology. The introduction of electric mobility is a multiplex and unpredictable process which does not occur all by itself. EV technology requires extensive investment by the government subsidising the technology, car manufacturers producing and developing the technology and not to mention the consumer. According to Steen, Schelven, Deventer, Twist and Kotter (2015), one of the possibilities to overcome the problems of an emerging market is governmental action with an array of policy options for governments to support the EV introduction.

Co-evolutionary studies have recently begun to refer to the political processes that might be involved where co-evolution appears (Child & Rodrigues, 2008; Dieleman & Boddewyn, 2012; Duarte & Rodrigues, 2017; García-Cabrera & Durán-Herrera, 2016). Interaction between the political institution(s) (Norwegian government) and the multinational enterprise (MNE) (car manufacturers) can over time affect the institutional environment (for the Norwegian EV market), where the developments can be viewed as an indicator of government policy effectiveness. The success of the growing EV market in Norway has been the

result of the implementation over the years of many small incentives to support the EV technology industry and to reduce emission from road transportation (EV, 14). Norway has a comprehensive EV policy scheme that has without any doubts been crucial to the development of the EV market and it has been the cornerstone of the Norwegian EV revolution. Norway has clearly defined goals for reduction in greenhouse gas (GHG) emissions for different sectors, which form the basis for the intense Norwegian climate policy.

The success in the Norwegian EV Market is nothing like others', but at the same time, there is uncertainty regarding how long these beneficial incentives and thus the high demand will last. In co-evolutionary theory, it appears that there are major uncertainties associated with regulatory uncertainties and that it again influences strategy. Norway reached their goal much faster than they expected and the increased volume of EVs is starting to bring up challenges due to, for example, capacity. The incentive scheme will from 2018 be adjusted to the EV market's development in the upcoming years.

The EV development has been extremely fast and the EVs have become better and more advanced making them now almost measureable with diesel/petrol cars. The uncertainty relative to taxes and fees or potential zero-emission zones makes Norwegian car buyers more careful now than before. Particularly now when there are major and rapid changes in technology and tax policy. Also, car manufacturers are experiencing some challenges due to changes in the institutional environment, resulting in e.g., high demands for EVs that exceeds the supply that car manufacturers have the opportunity to offer at the moment. How will the interaction between regulatory change (less demand) and technological change (cheaper cars – greater demand) be? Co-evolutionary outcomes, such as aggregated volume, modern EV technology and innovation can bring great success, but can also, as the Norwegian government and the international car manufacturers are now experiencing, lead to consequences resulting from market developments.

2. Research question

Norway has a high degree of government regulation, and new government regulation can be understood as a disruptive event, resulting in new rules that govern the market. The institution(s) set the rules of the game, and change in the institution(s) constitutes change in rules. Co-evolutionary theory suggests that firms co-evolve with the environment, meaning that MNEs have an impact on institutional change, but also that the institution(s) have an impact on the MNEs. The researcher wants to look closer at the co-evolution of firms' and institutions' strategies and the potential outcomes that comes from this interaction consequentially. According to North (1990) it is the institutional incentive structures provided by the government that determines how the rules of the game evolve and changes, and it is their actions and policies that regulates and attract the development of an industry or a market (Duarte & Rodrigues, 2017). In this case, the rules of the game are the Norwegian EV policy. The relationship between the Norwegian government and the car manufacturer build an arena of mutual influence where the limits of government enforcement are depending on the car manufacturers' economic power to invest in research and further development, and that their power is conditioned by the power of the governments to motivate the EV business and its competitive advantage in the Norwegian market. The researcher is interested in how the Norwegian EV market has become what it is today and how the uncertainty around new EV policy regulations might affect the future Norwegian EV market. Hence, the research questions of this thesis will be:

I. "*How the Norwegian regulations influence car manufacturers?"*
II. *"How the Norwegian EV market influence Norwegian regulations?"*
III. *"How uncertainty will influence the future EV market in Norway?"*

3. Literature Review

In this thesis, the researcher will use co-evolutionary theory in order to try to understand and explain the Norwegian EV market phenomenon. The co-evolution idea derives from biology as the idea of mutual evolutionary change in interplaying species, where change in one species was triggered by change in another related species (Jiang, Gong, Wang, & Kimble, 2016). This concept has

later been taken up and applied to organizational theory by Lewin and others (Lewin, Long, & Carroll, 1999; Lewin & Volberda, 1999). According to Lewin and Volberda (1999), the use of the co-evolution concept can have the potential to integrate macro- and micro-level evolution within a unifying framework, integrating multiple levels of analysis and conditional effects, and also lead to new insights, new understanding, new empirical methods and new theories. Also, in Huygens, Baden-Fuller, Van Den Bosch and Volberda's (2001) analysis at both firm and industry levels they show how the interaction between them makes firms and industries co-evolve over time. The history of the Norwegian EV market shows some patterns of co-evolution, instances where the Norwegian government and car manufacturers have "worked together" in order to push and drive innovation and EV technology development. Hence, and in order to address the research questions, the literature review will go over the literature on co-evolution.

Co-evolutionary studies have recently begun to refer to the political processes that might be involved where co-evolution appears, but most research and studies are done on developing countries with emerging economies (Child & Rodrigues, 2008; Dieleman & Boddewyn, 2012; Duarte & Rodrigues, 2017; García-Cabrera & Durán-Herrera, 2016). Very little has been done on developed economies, such as Norway. Examining the dynamics that are driving and shaping the interaction between government policies and market strategies might contribute to co-evolution theory from a political perspective. The researcher also wants to clarify how interaction between political institution(s) (Norwegian government) and the MNE (car manufacturers) over time can affect the institutional environment (for the Norwegian EV market) and if these developments can be viewed as an indicator of government policy effectiveness. Nevertheless, the researcher aims to understand the role of interdependence in the co-evolution of government and MNE strategies. Also, the co-evolutionary process, in which MNEs are involved, needs to be understood if the researcher is to make new and qualified managerial and practical suggestions to government policy or policymakers.

3.1 The role of the Government

The literature on international business (IB) has demonstrated how host country institutions can influence MNEs' strategic choice of location, entry, operational modes and performance through associated governmental actions. Institutions are defined as formal and informal rules of the game, or more formally, the humanly devised constraints that shape human interaction (North, 1990). Rules govern the interactions of actors such as domestic firms, MNEs, civil society groups, and government bodies, all of which contribute to determining the organization of economic activities (Fligstein, 2001). According to North (1990) it is the institutional incentive structures provided by the government that determines how the rules of the game evolve and change, and it is their actions and policies that regulate and attract the development of an industry (Duarte & Rodrigues, 2017). For example, institutional environmental changes can be caused by government regulations (Greenwood, Suddaby, & Hinings, 2002), and in the recent years we have seen more direct governmental interventions in the business world (Duarte & Rodrigues, 2017). The relationship between governments and firms build an arena of mutual influence where Child, Rodrigues, and Tse (2012), as mentioned earlier, suggests that the limits of government enforcement are dependent on firms' economic power, and that firms' power is conditioned by the power of governments to motivate or demotivate business opportunities and competitive advantage. The outcomes of government-industry exchange are increasing convergence of interests where the purpose of the rules of the games is production and innovation, which can also contribute to the country's economic development and growth.

Different political strategies aim to stimulate the supply and demand side in a market. Governments can use regulations and incentives to support and develop different types of technology and industries, which ensures new jobs, further research and development, and new investments in the country to improve the country's prosperity. The Brazilian automobile industry is an example where industry policies have been a result of exchanges between the Brazilian government and the foreign-owned car industry, which has arisen from changes in political and economic environments, and interdependence between the industry and the country's economy (D & R, 2017).

Vehicle emissions are one of the biggest sources of pollution in the world and a global green shift towards electric-mobility, and a focus on more climate-friendly solutions are some of the necessary steps to take in order to meet the climate crisis that the world is facing. The introduction of electric mobility is a multiplex and unpredictable process which does not occur all by itself. EVs rely on a mix of regulatory and government measures for their development since they have been facing a problem with unsustainable technologies and related barriers, and at the same time that it has been required an overall improved ecosystem for innovation in vehicle technology and business models. According to van der Steen et al. (2015) one of the possibilities to overcome the problems of an emerging market and to support the EV introduction is governmental action. EV policy providing economic incentives can trigger substantial sales effect and help the technology into the market and make it up and go in an early phase. Government priorities has been to drive innovation and EV technology development, increase competition and competitiveness.

3.2 Co-evolutionary theory

Institutional theory views organizations as embedded in institutional arrangements. The traditional IB view and organizational theory emphasizes the early approach of institutionalism where firms must accept and adapt to institutional pressures if they wish to gain legitimacy within any organizational field (Dimaggio & Powell, 1983). Recent IB literature on the other hand has proposed that firms co-evolve with the environment. Co-evolutionary theory suggests that firms and their institutional environments influence each other over time due to the interplay between them (Ahlstrom & Bruton, 2010; Rodrigues & Child, 2003). Generally, previous literature suggests that co-evolution is the shared outcome of managerial intention, environment, and institutional effects. The purpose of co-evolution research is to solve mutual adjustment mechanisms (Dieleman & Sachs, 2008). While evolutionary approaches deal with changes at industry/country or organization level, co-evolutionary theory attempts to identify the outcomes of the interaction between these processes of change (Pajunen & Maunula, 2008). The study of Cantwell, Dunning, and Lundan (2010) addresses this matter and suggests that the co-evolutionary theory requires a conjoining

framework that allows researchers to understand institutional change. They present an analysis that equally emphasis formal institutions (such as laws and regulations) and informal institutions (such as norms and values) as a source of uncertainty that confronts the firms. They developed a theoretical framework that takes into account the dynamic arrangement of the MNEs activities and the interplay between the activities, as well as the evolution of institutions that are both internal and external to the firm. They also argue that a driving force in the process of evolution is how the MNEs adjust their strategies and organizational structure to account for uncertainty and complexity in the development of their own activities within their environment. Their study connects historical changes in the character of MNEs activities to changes in the institutional environment. Their study also emphasizes the scope of entrepreneurship that might lead to co-evolution occurring within the environment. The role of institutions in the process of innovation enables a better understanding of the co-evolution between individual firms and their institutional environment. According to Cantwell et al. (2010) the value-creating activities of MNEs over the past two decades have become increasingly influenced by learning and innovation and technological development, where the efforts of creative research evolves over time. According to the authors, to the extent that these activities involve cross-border institutional adaptation and co-evolution by MNEs, this framework creates relevant conceptual and empirical contributions to international business and economics, political economy, sociology and organizational theory, (Cantwell et al., 2010).

While the framework of Cantwell et al. (2010) is fundamentally sound, it does not go deeper into the processes where co-evolution might appear. We know that co-evolution can take place, but we know little about how this actually happens. The fact that co-evolutionary studies have recently started to refer to the political processes that might be involved (Child & Rodrigues, 2008; Dieleman & Boddewyn, 2012). Child et al. (2012) gives a new theoretical and empirical insight into co-evolutionary development on corporate evolution from a political perspective. It focuses on the relations between firms and their institutional environments, which builds on Oliver's (1992) insight that strategic choice and institutional perspectives can be combined effectively. Generally, most of the attention has been given to external actors, such as institutions, and how they

enforce constraints on firms' strategy choices through compliance mechanisms and regulations (Kostova & Roth, 2002; Peng, Wang, & Jiang, 2008). However, Child et al. (2012) state in their study that firms are also able to influence governments or institutions. Several studies of corporate co-evolution on pro-action by firms have commonly considered the growth strategies firms have adopted within their marketplaces instead of considering how they relate to and with institutions and governments (Burgelman, 2002; Child et al., 2012; Santos & Eisenhardt, 2009). A political perspective focuses on the internationality and power resources of relevant actors, and suggests that co-evolution takes place not only through learning (Boisot, 1998), but significantly through the use of power and influence. They demonstrate that it is necessary not just to have relevant power resources but also to know how to use them (Cantwell et al., 2010). It develops an understanding of political dynamics which have generally been unappreciated in co-evolutionary studies. It also recognizes the role of strategic choices of both individual firms and external organizations.

The oil drilling in the Arctic is an example of co-evolution where the authorities and operators have been working together for many years to reduce the use and discharge of environmentally hazardous substances. In December 2015 world leaders, including Norway, signed the climate-agreement in Paris, which makes them obligated to reach and maintain certain climate requirements. The oil drilling in the Arctic will take place in ice-filled waters where it is dangerous, potentially inefficient, and difficult to establish and maintain oil drilling. The project's opponents, such as Greenpeace and parts of the EU parliament, claim that the technology is not yet at a level that makes it safe to drill for oil so far north (GN, 2017a, 2017b). The problem is that there is no method of cleaning oil in event of an oil spill in the Arctic, which would be almost impossible to control and which can occur in a unique and particularly vulnerable natural area. Although there is no knowledge or equipment to remove oil spills from ice, Statoil has secured licenses in all the Arctic states, and is the sole oil company that has done so. Since 2013, Statoil and eight other oil companies believe that the oil and gas industry is ready with the technology needed for oil drilling in the Arctic. They also believe that sufficiently comprehensive contingency plans exist should an oil spill occur (Lewis, 2013). Recently, the Norwegian government won their

lawsuit against Greenpeace, allowing them to continue their plans for more oil exploration in the Arctic (Doyle & Solsvik, 2018). Through several published white papers, authorities have set goals for what is considered as acceptable environmental impact levels for the oil and gas business (NEA, 2016). The objectives have been followed up by the authorities by making demands through laws, regulations and conditions in the companies' licenses to operate oil and gas activities. Within these limits, it is up to companies to look for, build and extract the resources that are profitable for the companies themselves and for society as a whole. The Environmental Directorate imposes strict requirements to operators and pushes the operators to develop new technology in order for them to meet these requirements.

Another example is China and their transition towards electric-mobility, where new regulations set by the Chinese government pushes car manufacturers to act and continue to develop new EV technology in order to meet the requirements of 10% of all new vehicles that are sold in 2019 needs to be BEVs or run on biofuel. Those car manufacturers that does not meet or follow the requirements will have to pay large fines or can even be denied selling cars in the Chinese market (E24, 2017). According to Bloomberg's New Energy Finance, will China take a leading position in the electric vehicle transition with almost 50% of the global EV sales in 2025 (Busch, 2018). The car manufacturers will just have to adapt to the requirements of the Chinese government due to the extremely large volume involved with the Chinese EV market.

In order to reach a better understanding of the relationship between the MNE and the environment it is necessary to use a more dynamic and co-evolutionary approach. The field-level conditions that drive MNEs to coevolve are almost unknown. Field-level conditions are those that make the institutional environment unstable and easier to change (Battilana, Leca, & Boxenbaum, 2009). Several circumstances, usually connected, can cause these conditions. Some examples may involve, among other things, new regulations and institutional contradictions (García-Cabrera & Durán-Herrera, 2016; Wright & Zammuto, 2013). In relation to EV markets, examples of field-level conditions that is relevant may be new government regulations regarding measures and incentives supporting EV

policies, and market developments as a result of improved EV technology and further product developing. For instance, the Norwegian government changing their regulations regarding their EV policy may make the future EV market in Norway uncertain. According to Acemoglu and Robinson (2012) there are two kinds of economic and political institutions that generate different levels of instability in the environment. The first one is the extractive institutions, where a small group of individuals concentrate power and opportunity and do their best effort to exploit the rest of the population. The second one is the inclusive institutions, where the rule of the law applies and where many people take part in the governing process, thereby decreasing the exploitation level.

Acemoglu and Robinson (2012) argue that in an inclusive institution, such as Norway, the political institution must provide justice, the enforcement of contracts, and education, and not only support innovative actions by firms with regards to economic success and growth. The oil drilling in the Arctic, and the Norwegian government's change of regulations in their EV policy (which provides attractive incentives for stimulating innovation and further development in the EV technology industry) are two examples of the effects of field-level conditions. Extractive institutions can also provide growth, but only temporarily. MNEs that fulfill relevant conditions required to influence the environment might not act as passive players seeking legitimacy in their relations with new government and regulations, even in developed economies (Riaz, 2009). Instead, they will most likely implement actions which will either cause failure of regulative change efforts or result in co-evolution. Thus, García-Cabrera and Durán-Herrera (2016) argue that a more integrated model is needed to understand how external and internal institutions act and evolve.

The work of García-Cabrera and Durán-Herrera (2016) identifies and examines these elements with respect to every stage of the co-evolutionary process. Their framework is based on the previous work and models of Cantwell et al. (2010) and Child et al. (2012), but they also include other variables, such as the expulsive and inclusive nature of institutions that involve the political and economic conditions of countries. They contribute to the IB literature by proposing a dynamic model for the co-evolutionary approach that demonstrates the interaction between the MNE and the institutional environment in which it operates. This

interaction must be understood as a co-evolutionary process where MNEs (institutional entrepreneurs) have an impact on institutional change (affect the environment) but that the institutions also has an impact on the MNEs. Their work (García-Cabrera & Durán-Herrera, 2016) finds that MNEs might use three forms of engagement in institutional changes in the host country to resolve controversies within the institutional environment. They suggest that if institutional adaption or avoidance are not successful forms of resolving a given conflict, the MNE will resort to institutional co-evolution. The study identifies a playing field where actors compete to achieve their interests and goals. This corresponds to what Fligstein (1996) called a "strategic action field" (García-Cabrera & Durán-Herrera, 2016).

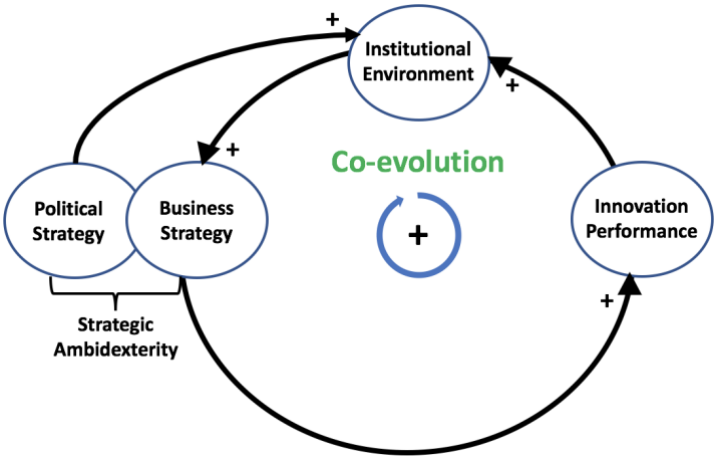

Figure 1: The co-evolution model.

What is suggested by the current literature on IB is that we need to understand the co-evolutionary process better in order to identify new, useful, and practical suggestions in the field of public policy (Duarte & Rodrigues, 2017). The national institutional framework can, for example, be considered as a relevant location factor that affects the attractiveness of a given country (Dunning & Lundan, 2008; Soskice, 1997). The study of García-Cabrera and Durán-Herrera (2016) generates new insights on institutional and evolution political perspectives. It does this by clarifying how the interaction between government and industry can affect industry outcomes and illustrate government policy effectiveness over time, and identify the causal mechanism(s) that drive co-evolution in an emerging economy or market.

4. Methodology

4.1 Research setting

The researcher has chosen the case of the Norwegian EV market. The Norwegian EV market had its breakthrough in 2010, and since that time, the rapid growth in the market along with the rapid change and improvement in advanced technology and production has contributed to making Norway one of the highest-ranking countries in the world when it comes to the number of EVs per capita. The change in Norway's regulations; providing an EV policy with the most attractive incentives and conditions for exporters (EV manufacturers), importers (wholly owned subsidiaries or EV dealers) and the end user (Norwegian consumers), constitute much of the reason for this success. Now, in 2018 and in the years towards 2021, new regulations will come into force that may cause a significant change in the EV market, the consequences of which are, for now, unknown. In this study, the researcher will look closer at the case of four EV manufacturers that are operating in the Norwegian EV market: Volkswagen, BMW, Nissan and Toyota. The researcher chose this research setting for several reasons. Firstly, the setting in and of itself is quite interesting and it is highly current. Secondly, Norway has a high degree of government regulation, and new government regulation can be seen as a disruptive event. Lastly, there are few studies conducted on this topic, and most of the co-evolution studies that have been done with this type of focus have concentrated on developing/emerging economies and not a developed economy such as Norway.

4.2 Research design

This thesis will provide examination through a qualitative longitudinal case study with an inductive approach. The unit of analysis will be the four car manufacturers mentioned in the setting. This is a research strategy that focuses more on understanding the dynamics which are present within single settings, rather than predicting them (Eisenhardt, 1989). The researcher is interested in how MNEs (car manufacturers) relate to the uncertainty caused by a change in institutional regulations (Norwegian government regulations) and how these institutions can affect MNEs' strategies. Case study method is preferred when "how" and "why" questions are to be answered (Yin, 2003). In order to discuss

co-evolution of firms' and institutions' strategies and the outcomes and consequences from this interaction, the author will analyse the Norwegian EV market from a historical perspective. Common characteristics of co-evolutionary studies are their historical and longitudinal approach. Most researchers employ an in-depth longitudinal case study method which provides the researcher with rich data and insight (Dieleman & Sachs, 2008; Duarte & Rodrigues, 2017; Jiang et al., 2016; Murmann, 2013; Rodrigues & Child, 2003). Also, a longitudinal perspective might help to understand how disruptive events, such as new government regulations and market developments, can result in new rules that govern the market. Lastly, the inductive approach allows the researcher to generalise based on observations found in primary data and secondary data (Bryman & Bell, 2011, p. 573).

4.3 Research case

The study of this thesis is centered on a nested case analysis, making a single case study of the Norwegian EV market with four embedded units of the four car manufacturers. Its focus is to investigate and observe in detail how the interaction between MNEs and institutions might play out over a longer period within its real-world context. The researcher will be able to explore the case when analysing data within the case analysis, and by comparing the case analyses, make a cross-case analysis that gives the researcher the ability to examine subunits within the main case (Gustaffson, 2017; Yin, 2003). The distinctive purpose of using a case study is to provide better insight that can contribute to the theory building. According to Yin (2003) single case research tends to use more theoretical sampling principles. The case study will be presented as a chronological report that presents the reader with a story from beginning to end. Making and presenting the findings to the reader in an understandable way is challenging. One way to do this is through the chronological report. It is also important for the researcher that the results are reliable, often accomplished by comparing the results to facts in published literature and existing data (Eisenhardt 1989). The case was chosen because the phenomenon of interest is visible and transparently observable (Eisenhardt, 1989). The case shows several observations of trends in the EV market and how the Government and politicians have and have had an impact on these trends through governmental regulations. The case is intended to

show causes of rapid changes that can result in great uncertainty for the future EV market in Norway.

Car manufacturers rely on the Norwegian market in terms of sales, product development and further testing of new technology. To date, Norway is one of the leading countries with regards to promoting EVs and has influenced other countries to do the same. Norway is an important and significant market for EV manufacturers. Firstly, Norway has been an important early market for the car manufacturers, specifically for Tesla and also for other manufacturers. Norway receives delegations from various manufactures that visit from all around the world, including all of the major car manufacturers. In fact, Norway is and has been invited to various countries around the world to talk about EVs and what Norway is doing with regards to EV policy (Lie, 2016). Secondly, Norway has become a test laboratory for the future green car industry. German and Asian car manufacturers launch their newest EV models in Norway because they know they will sell a large volume of their cars there. Over 34 % of all EVs that were sold in 2015 and 2016 on the Western European market were sold in Norway, and the EV is highly prevalent in the Oslo Municipality. Sture Portvik, states that Norway is an incredibly important test market (Lie, 2016). EV manufacturers have observed Norwegian consumer choices, how they react to different models, and how their car is doing in terms of competitiveness with other EV brands in this pioneering Norwegian market (Lie, 2016). EVs give the international car industry the reason to drive innovation in the Norwegian market. Volkswagen's EV manager, Christian Senger, said during his visit with the Volkswagen-delegation to Norway in June 2016 that Norway is an important country for them, and that it is crucial for them to offer the right EVs in this type of growing market (Frydenlund, 2017). Hence, the sub-question of interest for this thesis is: *Is the Norwegian EV market significant enough to affect the major car manufacturers' strategies?*

When it comes to subject analysis in this thesis, 4 significant car manufacturers operating in the Norwegian EV market have been focused on in order to understand how they relate and respond to changes in Norwegian regulations and the rapid change in the Norwegian EV market. Interviews with following brands have been conducted: Volkswagen and BMW, which provide both BEVs and

PHEVs, Nissan, which provides BEVs, and Toyota, which until now has only provided hybrid electric vehicles (HEVs), but recently announced that they will commit to producing BEVs and hydrogen cars.

4.4 Data collection

The thesis is based on multiple sources of both primary and secondary data. The researcher has collected the primary data through a number of interviews. These interviews are additionally supported through the collection of secondary (market related and historical) data in order to get a broader understanding of the chosen research area.

4.4.1 Primary data

The primary data was collected through four in-depth, semi-structured interviews with 4 high ranking Communications Directors, whereas two were men and two were women. The researcher used a selective approach when deciding on the participants, meaning they were not chosen randomly. As Communications Directors, are they responsible for all of the firms' communications, both internally and externally; communication aimed at employees, shareholders, media, influential members of business, politicians, the press, and society in general. Typically, they work with management and other departments within the organization, stakeholders, such as investors, analysts, customers and company directors. Hence, these interview subjects provide the study with first-hand knowledge and information that gives valuable insight into the perspective of the institution and the firms' operations within the institutional environment. The respective car manufacturers were more than happy to share with the researcher their reports, statistics, and presentations that they had conducted or created themselves. None of the interview objects wished to remain anonymous. The international car manufacturers represented are Volkswagen, BMW, Nissan and Toyota. The interviews had a duration of between 60-90 minutes and were recorded and transcribed. All of the respective car manufacturers have their main offices located in Oslo, Akershus, or in the Drammen area, which enabled the researcher to execute the interviews in a face-to-face setting. The researcher first sent a formal email to the potential participants with a request to be interviewed together with a short presentation of the chosen topic for the thesis. There is

always challenging to get in contact with respondents, but the chosen topic of the thesis was of high interest to them all and they were more than happy to contribute by booking an interview.

The intent of the researcher was to also interview the Secretary General of the Norwegian Electric Vehicle Association, Christina Bu, who presumably would have been able to provide valuable insight from both the industry and public perspectives. The Norwegian Electric Vehicle Association (NEVA) is an electric vehicle industry focused organization that constantly makes statements and express themselves in the media, including Christina Bu, who publishes reports and summaries from the negotiations and conferences in which they have participated. However, the researcher did not see this as necessary due to this information being easily accessible from secondary published data.

4.4.2 Secondary data

The thesis will rely heavily on secondary data that has been collected in order to support the findings, and to get a broader understanding of the chosen research area. Fortunately, the secondary data on the Norwegian EV market is rich, and available both in Norwegian and English. Data from a variety of sources has been used in this study, data which allowed the researcher to triangulate the results and therefore, improve its validity and reliability (Bryman & Bell, 2011, p. 397; Eisenhardt, 1989). To collect most of the data and documents, the "snowballing" method was employed. Other studies and sources that had already conducted research were reviewed, some of which the researcher then decided to include. The market data includes, among other things, market history, market reports and a great number of media articles. NEVA also provides many informative documents, press releases, updated news and articles regarding the Norwegian EV market, all of which are available to everyone on their webpage. Other data sources that has been included are published articles, journal articles, academic and related books, papers, reports, government records and reports, media articles and chronological events lists. The researcher also used secondary data that was already collected by other companies or individuals, e.g., questionnaires or annual reports done by Kantar TNS, The Norwegian Public Roads Administration (NPRA) or Motor, in order to get a better understanding of the context of the

Norwegian EV market. In order to collect all this data, the researcher used different websites and newspapers, both in paper and online form, the library, and different databases, such as Oria and Google Scholars.

4.5 Further focus and limitations in the thesis

This thesis will focus solely on the EV market in Norway. The study focuses only on passenger vehicles and light commercial vehicles. Furthermore, the study will be primarily concerned with battery electric vehicles, but will also take into account plug-in hybrid electric vehicles, due to the increased trend and the incentives that the Norwegian government is providing for both types of vehicles. The increased interest in plugin hybrids may have consequences for the EV market as it might affect the purchase choices of Norwegian consumers, as well as car manufacturers' strategic choices. For the sake of expediency, the following vehicle terms will be used throughout the thesis:

- Electric vehicles (**EV**)
- Battery electric vehicle (**BEV**)
- Plug-in hybrid electric vehicle (**PHEV**)
- Internal Combustion Engine Vehicle (**ICEV**)
- Hybrid electric vehicle (**HEV**)
- Zero-emission vehicle **(ZEV)**

The term electric vehicle (**EV**) will mainly be used in accordance with BEVs, but will also be used as a broader term to denote electric vehicles in general (unless specified otherwise). The researcher will only take into consideration policies concerning PHEVs and BEVs. Hydrogen cars have been added to the discussion as a comparative element in order to contrast government support and potential market effects. The firms' product range and their strategy will be focused on throughout the study. Currently, we can see a changing focus in some of the car manufacturers' product line. BMW is investing more in PHEVs. Volkswagen first focused on BEVs, then more on PHEVs, and are now investing more in their BEV line again. For quite a long time, Toyota was not interested in producing PHEVs nor BEVs, and stated that HEVs was the future. They have now done a complete turn and will invest in both BEVs and hydrogen cars. Charging infrastructure incentives have not been taken into consideration for this thesis. Finally, the study conducted in this thesis will include and end in year 2018.

4.6 Data Analysis

Qualitative case studies often involve a large amount of unstructured data, which makes the analytical process a bit tedious and time consuming. The researcher started to look through the data in a search for patterns or concepts that seemed interesting and promising. This resulted in some identified patterns and concepts that needed to be addressed and looked at further. The recorded interviews were transcribed and went through in order to identify even more important key points. The transcripts were then manually sorted by coding and grouped into different categories following the structure of the interview guide and in the light of the research questions. To improve the likelihood of accurate and liable results the researcher performed cross-case analysis in order to look for similarities and differences between the cases within the selected categories. The similarities helped to strengthen the findings while the differences gave a reason to explore further for explanations and to raise other important questions in the light of this. The results were formed progressively throughout the process of the data collection that lasted for a period of several months, emphasizing the connection between literature search, data gathering and the research analysis (Bryman & Bell, 2014).

5. Findings – The case of the Norwegian EV Market

In 2007 there was a game changer that gave a different meaning to the rules when new international agreements were signed and a new goal was set with a perspective towards climate. The rules of the game in the Norwegian EV market has been developed from economic and political context and types of exchanges between the Norwegian government and the international car industry. The political context of the Norwegian government used to be more industry-oriented, but has now become more market-oriented. Norwegian government has a goal to achieve: to electrify the transport sector and to reduce overall GHG emissions. This case will present four phases, which has been inspired by the work of Figenbaum and Kolbenstvedt (2013), where they have systematically divided the EV development in Norway into five phases upon year 2013. The four phases follow the market development of the Norwegian EV market from year 2007 onwards, each representing a new phase in the market.

Figure 2: The phases of EV development in Norway.

5.1 The Norwegian EV Policy Scheme

Norway has a comprehensive EV incentive program that has sped up the introduction of the EV to the Norwegian people. The incentive program has gradually been introduced since the early 1990's. The original reason behind the incentives was to help develop the Norwegian EV industry, such as the Norwegian car manufacturer of Think (Figenbaum & Kolbenstvedt, 2013). The national EV industry in Norway never managed establish itself but the incentives remained (Lorentzen, Haugneland, Bu, & Hauge, 2017). The following section will include a brief introduction to the Norwegian EV policy scheme, as it is important background information to this case.

The Norwegian EV policy scheme is a combination of government, municipal and local instruments and incentives. The most valued incentives are the tax breaks. These have had a significant effect on the purchase price of an EV, and have directly contributed to the increased EV market share. This was confirmed in a research done by the Norwegian Institute of Transport Economics (Fearnley, Pfaffenbichler, Figenbaum, & Jellinek, 2015). In order to explain this further, a brief outline of the Norwegian car tax system is in order. The Norwegian taxation system for cars is built on the *polluter pays principle* where a combination of the weight, NOx and CO_2 emissions is calculated in order to get the purchase tax on new cars. The tax is progressive, making heavier cars with high emissions very expensive but makes most of the EVs cheaper to buy compared to a similar petrol car, despite a higher import price (Haugneland, Lorentzen, Bu, & Hauge, 2017). The state income for the CO_2 purchase tax alone was around 3,5 billion NOK in 2016 with a total sale of 154.603 passenger cars (Haugneland et al., 2017) . This, according to Christina Bu, the General Secretary of NEVA, and others is the main reason why the Norwegian EV market is a success as compared to any other country.

5.1.1 Government instruments and incentives

One-time registration tax (one-time fee) is levied on all type of cars that are registered for the first time in Norway. It also applies to used imported cars, but there is a usage deduction which increases with the increasing age of the car. The one-time fee is calculated from the car's tax group, weight, CO_2 and NOx emissions and impact volumes, and engine power on some cars. A separate fee is calculated for each of the items that sums up the total one-time fee (TNTA, 2018). BEVs were exempted from the one-time fee from 1990 as a trial scheme, a scheme which became permanent in 1995. PHEVs also come out well with regards to the one-time fee due to low CO_2 emissions, and also because of a large deduction in the weight tax. These vehicle types receive a deduction of 23% of the weight before the calculation of the weight tax. The **annual road tax** (annual fee) is levied on all passenger cars registered in the vehicle registry from January 1st each year. There are different rates for annual fees on private cars and BEV, with hydrogen cars having been exempt from the annual fee since this year, 2018. The other petrol and diesel cars are charged a rate of 2820-3290 NOK. For private individuals that use a BEV as a company car and also for private use, a 40% reduction of **company car tax** applies. This benefit was introduced in year 2000 at a 50% reduction, and was recently reduced to 40% in 2018. The **value added tax** (VAT) is 25% and is added to all goods and services sold in Norway. On cars, the VAT is calculated on the purchase value without the one-time fee. BEVs have been exempted from VAT since 2001.

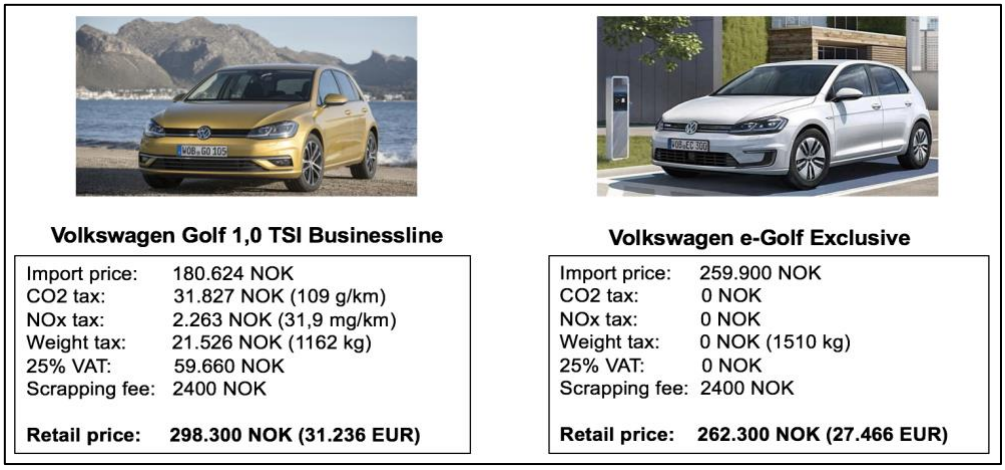

Figure 3: Norwegian price comparison between Volkswagen Golf TSI and e-Golf. Source: Haugneland et al., 2017.

5.1.2 Local and municipal instruments and incentives

BEVs received **access to public lanes** on chosen roadways in 2003, which became permanent in 2009. In 2015, the requirement to carpool with at least one passenger during rush hours in the Oslo area was implemented. This was in order to limit the amount of BEVs that used the public lane capacity to better accommodate public transportation, such as buses. BEVs got exemption from **toll roads** in 1997, which can give a large economic benefit for the BEV owner, since there are quite a few toll stations around the bigger cities and on Norwegian highways. As of 2018, BEVs have a 50% price reduction on **ferry tickets** to ferries connected to the major highways. Until recently, BEVs have had free access to ferries since 2009. BEVs have had **free municipal parking** since 1999. In 2017, it was decided that it was up to local governments to decide if they wanted free parking or not. In many areas, the electric power that is loaded into the BEVs is also free at municipal charging stations.

INCENTIVE	YEAR	COMMENT/CHANGES
No purchase/import taxes	**1990**	Permanent in 1996.
Reduced annual road tax	**1996**	Zero annual road tax from 2018.
Exemption from toll roads	**1997**	
Free municipal parking	**1999**	Up to local governments to decide from 2017.
50% reduced company car tax	**2000**	40% reduced company car tax from 2018.
Exemption from 25% VAT on purchase BEVs	**2001**	
Access to public lanes	**2005**	- Permanent access to public lanes from 2009. - Up to local governments to decide from 2017. - From 2015 in Oslo area it is required carpooling with at least one passenger during rush hours.
Free access to ferries	**2009**	50% price reduction on ferries from 2018.
25% VAT exemption on leasing BEVs	**2015**	
Zero re-registration tax for used BEVs	**2018**	

Table 1: Overview of all the Norwegian BEV incentives.
Sources: NEVA, 2018.

5.1.3 Background history of the Norwegian EV market 1996 - 2006

The EV development in Norway has previously gone through three phases by the year 2009: Concept development 1970-1990, Testing 1990-1999 and Early market 1999-2009 (Figenbaum & Kolbenstvedt, 2013). During the first phase, prototypes of EVs and their drive-systems were under development. A lot of research and support was necessary and was provided during this phase. The second phase focused on testing the technology and trying to remove disincentives which made EV purchase almost impossible, not to mention too expensive. Up to this point, EVs have been low on the political agenda. During phase three, Bellona, an

independent organization whose goal is to meet and fight climate challenges, came onto the scene and got the first BEV registered in the Norwegian vehicle register. They proposed a regulatory framework that favoured BEVs. The work of Bellona and other non-governmental organizations (NGOs), such as the Norwegian Electrical Vehicle Association (NEVA), as well as creative entrepreneurs and avid enthusiasts lead to the acceptance of the BEV by the Government and politicians. As such, an opportunity to create Norway's own BEV production (Think) emerged. BEVs became higher on the political agenda throughout this period, and new instruments and incentives for EVs were established. During this phase, large and influential actors with lots of resources started to enter the playing field. This drastically increased competition, and made it impossible for Think to keep up. Think was declared bankrupt in 2011. After the local EV industry almost disappeared, the reasoning behind the incentives has gradually shifted towards local and global emissions (Lorentzen et al., 2017).

5.2 Phase I: Early Market 2007-2009

As the end of the Norwegian EV industry came, the main drivers for incentives have been climate and environmentally related issues (Haugneland et al., 2017). Norway has clearly defined goals for the reduction of GHG emission for various industrial sectors. In the transport sector, different instruments and measures to increase the amount of EVs have been the subject of public reports, white papers and political settlements.

In 2007, the abatement plan for 2006-2007 was published. This report reviews measures in order to reduce GHG emissions in Norway. The information is based on a number of previous investigations performed by The Norwegian Pollution Control Authority (NPCA) and other institutions. NPCA has extensive experience in preparing abatement plans for reducing emissions of, among other things, NOx and GHGs (NPCA, 2007) . Such analyses have been important in order to follow up international climate and acid rain agreements. The first climate abatement plan was prepared in the early 1990s. In NPCA's abatement plan for 2006-2007, measures were taken to replace diesel and petrol passenger cars with BEVs. Total emission reduction from the measure was calculated to be 7519 tons of CO_2 equivalents in 2010 and 235.577 tons of CO_2 equivalents by 2020. It was assumed

that by 2020, around 2% of passenger cars could be replaced by BEVs by a gradual phasing in of 2% of new car sales from 2010 and 5% of new car sales from 2015 and until 2020. This would lead to over 70.000 BEVs on Norwegian roads within 2020 (NPCA, 2007). Norway had now a new perspective and goal: "Emission reductions". The Norwegian government committed to maintaining all of the incentives, and together with NGOs, such as NEVA, they began to promote and talk about BEVs and what potential they could have for the future.

The first agreement in Parliament on the climate report and the first agreement on climate policy came in 2007. In this report, a new goal for 2020 was created with regards to reducing GHG emissions, specifically in the Norwegian transport sector. Opposing scenarios (policy changes vs. status quo) were reviewed and analysed. The agreement was a result of political consensus regarding Norway's assuming responsibility for reducing GHG emissions through a national policy. The agreement contains several targets for overall emission reductions by 2020 and ambitions for national emission reductions, as well as a long-term goal of making Norway a low-emission country (MCE, 2014). In October 2007, the government adopted a target that new cars should not release more than 120 grams of CO_2 per kilometre (g/km) in 2012. The target was adopted at a time when the EU had set target emissions for 2012 that were not to exceed more than 130 g/km from the car itself (Figenbaum & Kolbenstvedt, 2013).

The Climate Cure project was then established by the Government through a common mission on the behalf of different ministries, such as NPRA, Ministry of Climate and Pollution, Norwegian Petroleum Directorate, The National Air Navigation (Avinor), Norwegian Maritime Authority, Norwegian National Rail Administration and Statistics Norway. Climate Cure are considering the potential for national emission cuts within all sectors. The work within the transport sector was led by the NPRA. The first White Paper and climate agreement was published in 2007 "Climate Cure 2008-2010", where actions for reducing emissions for new passenger vehicles (for example, *efficiency of vehicles with combustion engine, better tires, electrification and Hydrogen)* were described. Electrification actions implies that BEVs and PEHVs will replace internal combustion engine vehicles (ICEVs), electricity in this context being a zero-emission energy source. Hence,

every BEV that replaces an ICEV will reduce the CO_2 emissions by 100% (Figenbaum & Kolbenstvedt, 2013).

During this phase, Transnova was established in 2009, and had a crucial impact on the development of the battery charging infrastructure and the further development of the EV market in Norway. Transnova is a state-owned organization that was established in order to speed up the technology development and concepts that could reduce GHG emissions from the transport sector in Norway. Transnova is also in charge of many state supported projects and initiatives that contribute to faster implementation of new and more efficient transport technologies and transport practices. These projects build competence by supporting learning and experience, which constantly contributes to the reduction of various solution barriers in the EV industry. The Norwegian Government allocates funds to Transnova through the annual budget planning .They are responsible for developing the National strategy and Finance Plan for the battery charging infrastructure in Norway and are an important contributor to the EV policy (Solem, Jonsen, & Nørbech, 2014, p. 8). In 2008, the first municipal EV-charging infrastructure program was launched in Oslo, and as you will see in the next phase of this case, this had a significant impact on the number of EVs that were subsequently sold in Norway (Blaney, 2018).

The BEV incentive that was implemented during this period was the free access to ferries in 2009. Access to public lanes became permanent in the same year. In 2007, the Norwegian government had encouraged the Norwegian people to buy diesel cars by reducing the taxes on new diesel cars, making them more favourable as compared to a similar petrol car. This resulted in a huge growth in diesel and during a sustained period, the share of diesel cars was at 70% for many years. The government called the tax reduction environmentally friendly, however by just 2008 it turned out that this was not the case, due to their high NOx emissions. In a study conducted by the Department of Transport Economics and the Norwegian Institute of Air Research on the behalf of the NPRA and the Climate and Pollution Agency it showed that increasing emissions of harmful gases in Norwegian cities was primarily due to increased number of diesel cars on the roads (TØI, 2011). The government changed their minds and started to charge

diesel cars as heavily as petrol cars. This made it very expensive to buy a new diesel car and to own one, resulting a big drop in sales of diesel cars, especially around the bigger cities.

During this period, the Norwegian EV market was moving slowly, and there were few sales of BEVs. There were not that many models to choose between and not that many people were interested in these alternatives. There were the smaller cars in the market, such as Buddy, Reva and Think, and many did not see them as the safest alternatives. Nor did they meet the expectations of a large portion of the car consumers in the Norwegian market, many of whom had completely different types of preferences in terms of range and intended use. In 2010, Think City had 84% of the market share of the BEVs with their 331 cars sold, something that points out the small scope of BEVs at that time (eafo, 2018). The international car manufacturers started to look curiously towards Norway and saw a potential there. But it was still an early market, and turning their attention and resources towards EV production was and still is a very expensive process. Most of them stayed put and followed the Norwegian market from the side-line.

5.3 Phase II: Market introduction 2010 – 2012

The EV market did not start to evolve before the big international actors with significant resources started to enter the playing field. The introduction of the modern age BEVs was spearheaded by the introduction of the Mitsubishi i-MiEV in 2010, followed by Peugeot iOn and Citröen C-zero, the "French shamrock". These BEVs became popular in the city areas and were perceived as city cars, with their small size and limited range of barely 100 kilometres. In this early market, these consumers primarily consisted of city-based commuters who charged their vehicles at home or at work, and had a limited need for a public network of charging stations (Lorentzen et al., 2017). These cars were also purchased and used by many of the various municipalities in Norway. They were, and are still, commonly used in the healthcare sector with regards to home nursing. The French shamrock had a combined market share of 72,4% of the total BEVs in 2011 with 1455 sold cars.

Then Nissan LEAF came onto the scene in 2011 and changed the game. Nissan had been working on the development of this car for several years. Nissan entered quite early and stated that this was a long-term strategy for them. They were committed to devoting many of their resources in order to continue the development of the BEV, as they felt it was the future. At that time, all of the other car brands, except from Tesla, continued to sit on the fence and followed Nissan's development. Nissan Leaf became a huge success in Norway. It was the first BEV that was actually well-suited for the Norwegian market, its size and safety features making it family friendly. In 2011, the market share for the Leaf was 19% with 381 cars sold. In 2012, it got a 58,2% market share with 2487 cars sold. In contrast, the French shamrock's market share was reduced from 72,4% in 2011 to 39,3% in 2012 (eafo, 2018). Nissan had been considering launching the Leaf in countries other than Norway, since it was a small market. But they saw potential in a market that really focused on BEVs, and one where the Government was on the same page, even facilitating the sale of BEVs. Furthermore, EV technology and the image of seeing BEVs on the Norwegian roads was starting to be more common and increasingly familiar. The incentive scheme was still in place and people started to talk about the BEV phenomenon. More and more people dared to make the choice of buying one, and the word started to spread, along with the recommendations from the users.

The Government did not reach the target of 120 g/km in 2012. Actual emissions came in at 130 g/km. However, the Climate Cure project was a part of the foundation for the preparation of the new agreement on the climate report that came in 2012. That same year, a new updated white paper, "The 2012 agreement on climate policy", was published and the report was presented to the Parliament by Stoltenberg's II. Government. Fourteen proposals for climate measures were approved and the "85 g/km target" was adopted. This target states that the average emissions from new cars in 2020 will not exceed 85 grams of CO_2 per kilometre. The 85 g/km target forms the basis for the intense Norwegian climate policy and also gave new motivation to maintain the EV incentive scheme that was being used to drive Norway's climate goals. The BEV was used as an argument, and presented as a climate measure. Since the target of 120 g/km in 2012 was not reached and the new target of 85 g/km was set, the Norwegian government soon

saw the need to reduce emission much quicker in order to reach this by 2020. They quickly realized the increasing dependence on BEVs to further reduce the emissions. Thus, the Norwegian politicians agreed that the economic incentives for EVs would be extended till out year 2017, as long as the number did not exceed 50.000 sold BEVs by that time (Ministry of Climate and Environment (MCE), 2012).

During the phase starting in 2012, the first Plug-in hybrid vehicles (PHEVs) were launched. The technology is a combination of an electric vehicle and a hybrid vehicle. The fact that the EV technology was already well-known by then was a major advantage to the PHEV. It had a rather slow start but the number of PHEVs sold and registered in Norway has increased significantly since then. The PHEVs got a 15% weight deduction and were advantageous in terms of costs from the one-time fee system due to their low CO_2 emissions. Many people were not ready for a zero-emission vehicle due to range anxiety, but they still wanted to take advantage of the tax benefits that was given to EVs. For them, a PHEV was the solution, and it has been a crucial and important intermediate solution in order to get more people on the BEV track. PHEVs also have access to the same charging stations as the BEVs. PHEVs are similar in costs to produce as BEVs, making them a more affordable and attractive choice when compared to an ICEV. In 2012 EVs in total accounted for 3% of all car sales in Norway (Blaney, 2018). The development of the infrastructure incentive containing public funding for fixed charging stations every 50 km on main roads was the only new incentive in this phase of the EV development. In order to sell more BEVs, Norway needed a broader charging infrastructure nationally, which Transnova was continually working on. Nevertheless, BEV sales have increased significantly from 2011, even without the introduction of other new incentives.

Then in 2012, Tesla launched Model S. This car outclassed all of the other existing BEV models when it came to range, design, price and size. Tesla saw the potential and opportunity to strike early in the Norwegian market, and gained a huge competitive advantage due to no significant competition. With the Norwegian market in place, it opened an opportunity to sell many thousands of BEVs quickly. This in turn enabled them to increase their production rate. It was a

combination of being at the right place at the right time. Tesla went from selling 32 BEVs in 2012, to 1986 BEVs in 2013, achieving a market share of 24,1% (eafo, 2018). After Tesla entered the field, the efforts of the other big car manufacturers changed significantly, and several of them threw themselves into the BEV market.

5.4 Phase III: Market Expansion 2013-2017

By the beginning of 2013, BEV started to establish itself in the Norwegian market and acquired a market share of 3% of the total vehicle fleet. After Nissan and Tesla entered the field, several of the other major international car manufacturers threw themselves on the EV trend with their own BEV model, resulting in an expansion in the Norwegian EV market. First out in 2013 was Volkswagen (VW) with the e-UP model, which got quite popular as soon as it was launched to market. At the end of the year 2012/2013, VW had taken a strategic decision to become a leader in rechargeable cars, both BEVs and PHEVs. Their strategy and most important goal was becoming a leader in electrical mobility. VW has one of the world's largest research budgets within this field and by year 2025, they will have brought to the market 80 new rechargeable cars, whereas 30 of them will be fully electric. By 2030, that number will be 300 rechargeable vehicles. When they released VW e-UP, the management had already decided that they should invest in distribution throughout Norway, not just on a few selected dealers, a strategy that many of the other manufacturers had chosen in order to sell their BEVs. This made it possible for them to sell BEVs and PHEVs all around the country, and that the consumers could take their car anywhere for maintenance and service.

Soon after at the end of 2013 did BMW come out with their i3 model. A BEV that differed quite a bit from the other cars already out on the market. This was a car that was built 100% as a BEV from the start. When the car first came out on the market, it was still quite new to some and the price was quite high. The EV market was very price sensitive and the car dealerships was entirely dependent on getting the right product from the factory with Norwegian prerequisites. After a slightly slow start, the i3 got very popular, and eventually it became the most sold BMW model each year. To date there have been total sales of 16.627 cars. Ford also released a new Focus Electric model the same year, but it was not a success.

This was due to the starting price being perceived as too high. Another factor was that Ford decided to drop a special customized electric drivetrain, making it difficult to produce without having its own platform. The lack of DC fast-charging was nevertheless the model's biggest challenge. The model was pulled off the market in 2018, having manage to attract only around 400 buyers in Norway during its time (NEVA, 2018b).

Following year did VW come out with e-Golf, which was their beloved Golf model in an electric version. Golf GTE also come out at the same time, which was their PHEV version. Both became very popular in the Norwegian market, with waiting lists filling quickly. This same year, Kia Soul, Renault Zoe and Nissan e-NV200 were launched, followed by Mercedes releasing the B250e, a collaboration between Tesla Motors and Mercedes-Benz (NEVA, 2018c). In 2015 Norway reached the milestone of 50.000 new registered BEVs, an incredible achievement for Norway. Simultaneously, with BEVs passing 50.000 car mark in Norway, there was uncertainty regarding what would happen to the EV policy. This meant that there was now political space to do something with the many incentives that benefited the BEV. The goal was reached much sooner than what they had expected. Nevertheless, the Government and the politicians had given a strong signal by signing international agreements indicating they wanted to proceed towards achieving their long-term goal of 85 g/km by 2020. Hence, the economic incentives for EVs were continued and extended through the year 2017. During this time BEVs got 25% VAT exclusion on leasing cars and the market share of BEVs just continued to increase rapidly. The weight deduction on PHEVs increased from 15% to 26% this same year and the sales skyrocked after that, making the PHEV a very popular choice. Transnova's tasks was transferred to Enova this year, which was created in 2001 (Enova, 2015).

In 2016 Tesla finally came out with their Model X, the first BEV in the bigger car class. Model X had with 7 seats, 4x4 and a tow bar – all of the Norwegian preferences. An upgraded e-Golf was also launched onto the Norwegian market and had a range of 300 kilometres, making it more suitable as a company car, particularly since the reduced company car rate was advantageous. Hyundai IONIQ was also released the same year, which was the first BEV from the Korean

manufacturer. Since then, the model has confirmed its position as the most energy efficient BEV on the market and has become extremely popular due to its longer range of 280 kilometres. The Norwegian EV market had exploded and the Norwegian people had EV fever. Suddenly, the demand for EVs was so high that the car manufacturers had trouble delivering cars to the Norwegian market.

By just 2016, did Norway reach the milestone of 100.000 new registered BEVs. In 2017 Opel Ampera-e offered a 500 kilometres electric range and Smart EL was released. Later that year, Norway reached 140.000 new registered BEVs. As of January 2017, it was up to the local governments to decide the incentives regarding access to bus lanes and free municipal parking. Regardless, it cannot be more than 50% of standard rates for conventional cars (Haugneland et al., 2017).

The new BEV models that were hitting the market at this moment and in the upcoming years were way ahead of the previous models that had been out there for the past several years. The development had been extremely fast, and the BEVs had become better and more advanced, making them now comparable with traditional ICEVs. BEVs now offered more exhilarating, comfortable and safer cars that were more convenient and required less maintenance. Most of the car manufacturers were now committed to electric cars; not because they had to be, but because they could and it was and still is definitely the time for it these days.

Then the new Government's proposals to the 2018 state budget regarding EVs was published in 2017, which might have consequences for the future EV market (MF, 2017a). It was suggested to introduce a one-time fee on the heavier BEVs and would in practice, only concern BEVs over 2,2 tons. This fee would make it less advantageous to buy bigger family cars and vans which are fully electric. It would also affect yet-to-market BEVs with longer range and with more advanced technology and heavier battery packages. This meant that one of the Norwegian favourites, Tesla model X, would be now approximately 70.000-90.000 NOK more expensive to purchase than before, something which could have a decisive effect on the potential sale for this model. At the same time, it was suggested that the company car taxation should be doubled. The exemption on the company car tax on BEVs was at this time 50%. This meant several thousand NOKs each

month in increased expenditures for those that had or were already considering changing to a BEV as a company car. The re-registration fee was suggested to be removed for BEVs, something that was supported by the NEVA due to the fact that it could contribute to the stimulation of a bigger second-hand market for BEVs. There was second-hand market concern for BEVs because of uncertainty about the battery capacity after a few years of use.

In 2017, at end of this phase, 141.951 BEVs and 67.171 PHEVs were registered in Norway, and EVs now had a combined market share of 39,2%. 2017 was also the year when the Norwegian car history was rewritten. Driven by both tax incentives and a broad selection of good alternatives, Hybrid, PHEV and BEVs passed the traditional petrol and diesel cars on the sales statistics by 52.2%. This had never happened before in any country (OFV, 2017). The market share of EVs of a total of 2.7 million passenger cars in Norway in 2017 was 10.4% where BEVs accounted for 5.1% of them (NEVA, 2018a). It was reasonable to assume that the strong demand would continue and increase as long as the incentives were constant and because more car dealers and car brands would sell and launch BEVs. More and more people would know someone who owns a BEV, and thus gain knowledge of the technology, and car dealers would now be more familiar with BEVs, providing the consumer with the right type of services.

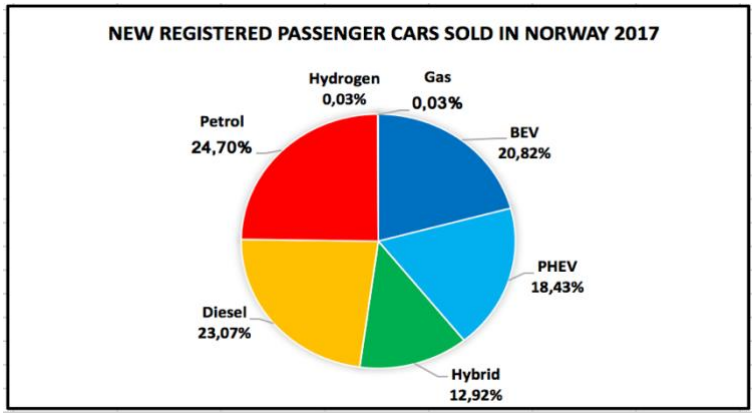

Figure 4: New registered passenger cars by fuel in Norway in 2017.
Source: NEVA and OFV, 2018

5.5 Phase IV: The Established Market 2018 – 2020

At the beginning of 2018, 20% of new car registrations in Norway were BEVs. One might say that Norway is on the right track. The Norwegian government

wants to reach 250.000 BEVs by 2020 (Blaney, 2018). NEVA and The Norwegian Automobile Federation (NAF) together with ten other organizations, EV consumers and enthusiasts had been of the opinion that the specifics in the government's proposals in the state budget were going in the wrong direction. That it was in fact weakening the EV policy instead of strengthening it. The government cannot start to abolish the EV policy if they want to reach the 85 g/km goal by 2020, and the goal of all new vehicles being sold from 2025 onward should be zero-emission. They should instead keep up the pressure. The Secretary General of NEVA, Christina Bu, stated to the magazine Dagens Næringsliv (Sæter & Eidem, 2017) that only 5% of the vehicle fleet are fully electrical, and there is still a lack of good family cars that are fully electrical, something that many are waiting for. She also adds that no one thought that the BEV benefits would last forever, but that if the Government pulls out the plug too early and begins sending out mixed signals, the result could be great uncertainty among the Norwegian people.

Even if the government wanted to extend there is a bigger international picture where Norway must comply with international rules. On November 7th, 2017, the Ministry of Finance sent the notification of tax measures for EVs to the EFTA Surveillance Authority (ESA). It was crucial and necessary for the further development of the Norwegian EV market to get this application approved from ESA, or else would Norway face problems reaching the goal of selling only ZEVs by 2025. On December 19th, 2017, it became known that the existing VAT exemption for the purchase and leasing of BEVs was approved by ESA out year 2020 (ESA, 2017) . In addition, did ESA approve new exemption for annual fee, re-registration fee and stronger incentives for the purchase of BEVs and electric vans. BEVs are now becoming significantly more favourable after tax. The three new measures will run from January 1st, 2018 and out year 2023, which are full exemption from annual fee and re-registration fee for electric cars and a 30% depreciation rate for electric vans. Today, Norway only have 2% electric vans, which is way too little according to Christina Bu (NEVA, 2017). She also believes that with the new approvals, the BEVs will be able to compete better and encourage the Norwegian employers to take a greater social responsibility and electrify their car park.

The Norwegian Government then decided to keep the purchase incentives for ZEVs (fully electric or hydrogen) until the end of 2021. After 2021 the incentives shall be revised and adjusted to the market development. The company car tax was reduced from 50% to 40% after a number of counter-arguments from both NEVA and various active car manufacturers operating in Norway, such as VW and Nissan, to take away this benefit. The ferry prices were reduced to 50% of standard fee. As of July 1st, 2018, there were new regulations where PHEVs will receive a weight deduction of 23% (down from 26%) if they have an electric range of 50 kilometres at the minimum. The tax benefit for PHEVs with less than 50 kilometres in electric range will be further adjusted down to only half of the weight exclusion. Hybrid cars will lose their remaining tax advantage of 5%.

On May 22nd, 2018, it was announced that the Norwegian government had put forward new rules for the phasing in on toll roads for BEVs, which opens up for municipalities to choose if they want to introduce half price for BEVs already in 2018 (MLGRD, 2018). NEVA strongly disagree to this and think that this is too early and steep, and that it is not a good EV policy as it would slow down the process of development that Norway currently has (Linge, 2018). The exemption from toll roads is a very strong economic incentive and for many people the main reason why they consider a BEV in the first place.

DN predicts that 2018 will be the year when the EV market will begin to loosen up. There are still news and new promises from the car manufacturers about the electric cars that will be released into the market. These are cars of all classes that will come with significantly much longer range and volume. Already this year, Nissan released their new generation Leaf with 400 kilometres range which became a huge success. Nissan decided to have the European launch of the new leaf in Norway, which was a great deal both to them and for Norway. It is very expensive to have such a launch in a country like Norway. The upgraded Renault Zoe 2 with a 400 kilometres range did also come out on the Norwegian market at the beginning of this current year. Norway is expecting Jaguar i-Pace, Hyundai Kona, BMW i8, Mini Cooper SE Countryman, KIA Niro in the second half of 2018 and the Norwegian people are already showing great interest in the models

to come. During Frankfurt Motor Show 2017 several of the major car manufacturers such as, Volkswagen and BMW, showed their upcoming electric car series that are on the way and estimated to be on the market by 2020. Frankfurt Motor Show is the world's biggest car expedition held every second year in Frankfurt am Main in Germany. Toyota also announced recently that they would go all in on BEVs, which was a surprise for many due to the fact that Toyota for a long time said that hybrid and hydrogen cars were the future. They will launch their EV series hopefully within 2019 along with Mercedes-Benz who also will launch their brand new EV series. The Norwegian people can also expect a new Citigo BEV model from Skoda the same year.

Year 2020 is predicted to be the new year that will revolutionize the EV industry. Norway was early out doing research on the EV and the Norwegian government has been a major driver on the EV technology and its development through the years and has always wanted and supported the innovation. Also, BMW Group Norway acknowledge in a fresh press release, yet again, Norway and the great job the government and the Norwegian people have accomplished to show that fully electric cars work well. Norway's competitive advantage and also significance is that the market is 5-10 years ahead of the other countries. Norway were early adopters and has acquired unique user experience and new services for BEV owners during these years. So far in 2018, with latest numbers from June 30th, Norway have 167.745 registered BEVs and 83.957 registered PHEVs with a combined market share of 46,6% making Norway the world's leading EV market owning the largest share of EVs in the world, almost 1/4th (eafo, 2018). Norway is also the first market where PHEVs are truly a mainstream. The amount of PHEVs that has been sold in Norway since 2012 provides Norway with the opportunity to get unrivalled experiences related to EV incentives that are rated by real life EV users (Haugneland et al., 2017).

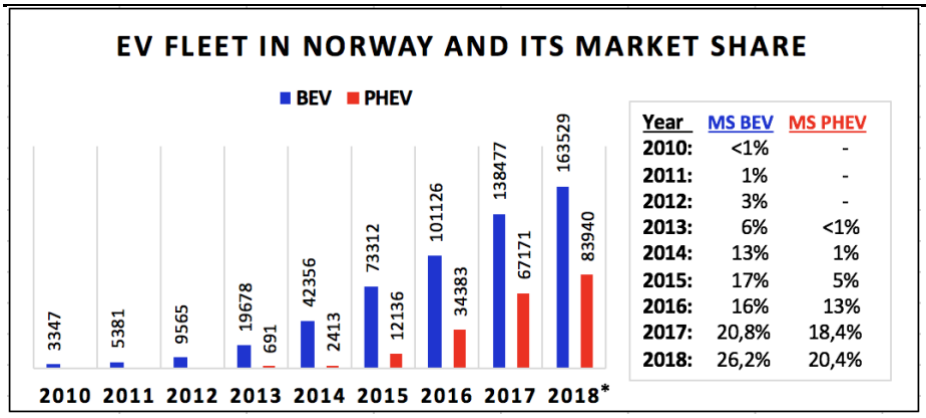

Figure 5: The EV fleet in Norway and its market share.
Source: NPRA and NEVA. *Last updated: 30th June 2018.

A new white paper" The National Transport Plan 2018-2029" was presented at the Storting in 2017 where the Ministry of Transport's proposals were adjusted on some points and then approved. This is a plan for how the next twelve years will work towards the overall and long-term goal of transport policy. A transport system that is safe, promotes value creation and contributes to conversion to the low-emission society. It also appears in the White Paper that the common goal is to reduce emission by 40% within 2030 and that the transport sector is the biggest polluter, where ZEVs has the biggest potential. According to the Ministry of Transport and Communications it should be possible to reduce 2,7 million tons by 2030 if only ZEVs are sold after 2025 (MTC, 2017).

A long-term goal has been set by the Norwegian government but there is still a lot of uncertainty regarding what will happen in the nearer future in terms of changes to the incentive schemes. Will the costs be added to the purchase of the car or to the user expenses and in that case how fast and how will this happen? The government treasury lacks NOK 5 billion in tax revenues already due to the EV incentives and if the goal is to only sell ZEVs from 2025 this means zero in revenues by that time. It is reasonable to understand that the incentives will not last forever and that it will be phased out at some point. What is Norway's role in all of this? Norway is on its way into a new phase called "EV boom" with brand new technology and sooner rather than later the Norwegian EV market will be well-developed. The car manufacturers, but also the Norwegian people, are missing some kind of predictability ahead. This in order for car manufacturers to keep on providing the market with the right kind of products and services to the

Norwegian consumers and for the Norwegian people to continue to take the chance on BEVs.

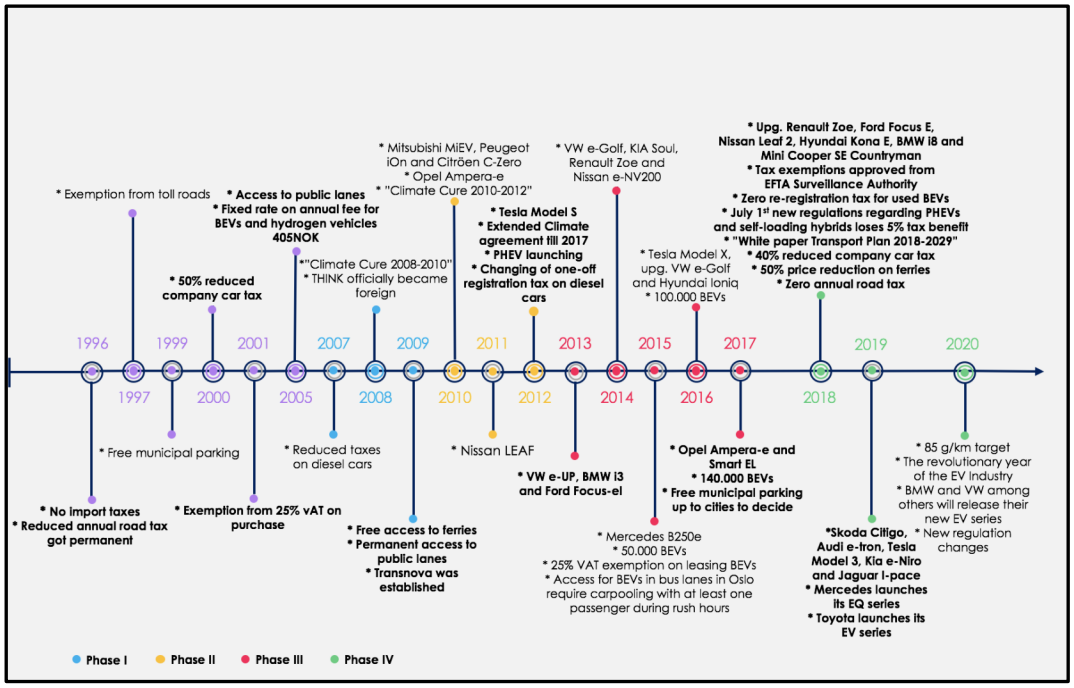

Figure 6: Timeline – The Norwegian EV Market.

* See Appendix 2 for full size.

6. Discussion

6.1 Summary of the findings

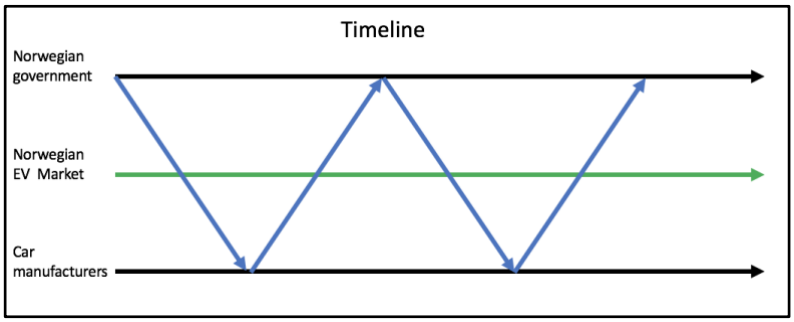

Figure 6: The process of co-evolution.

The process of co-evolution in the Norwegian EV market can be explained as follow:

1. Government regulations affect the market in the way customers react to them.
2. The market then again affects car manufacturers in the way customers react, increasing the demand for EVs.
3. Car manufacturers affect the market in the way they develop and provide the market with broader selection of EVs, increasing the offer/supply.

4. The market is being influenced by the car manufacturers because more customers buy EVs, increasing the volume.
5. The developed EV market is then affecting the Government and the rules/regulations.

By summarising the findings during the four different phases of market development in the Norwegian EV market, one can observe processes where co-evolution can appear. During the first phase the main drivers for incentives were climate and environmentally related issues where the goal was to reduce emission. The Norwegian government presented "Climate Cure 2008-2010" and kept all of the incentives, including the implementation of new ones, with the intension of increasing the EV interest among the Norwegian people by making it more convenient and beneficial for the EV user. During this period, the Norwegian EV market moved slowly, since there were not that many models to choose between. The international car manufacturers started to look curiously towards Norway and saw a potential there, but it was still an early market and most of them stayed put.

During the second phase "the 2012 agreement on climate policy", was published and the "85 g/km target" was adopted. The "French shamrock" was introduced in 2010 and was later followed by more competitive EV models, such as Nissan Leaf and Tesla Model S, which was more well-suited for the Norwegian people due to range, size and safety matters, increasing the interest. The Norwegian politicians agreed that the economic incentives for EVs would be extended till out year 2017 in order to still motivate the Norwegian people to buy EVs and to maintain the interest from the international car manufacturers to invest in/prioritize the Norwegian market. The charging infrastructure incentive was implemented in order to make the EV more beneficial to use. As a result, more and more people dared to make the choice of buying an EV and the demand increased significantly.

At the beginning of phase three, the EV started to establish itself in the Norwegian market and several other major international car manufacturers threw themselves on the EV trend resulting in an expansion of EV offers. In 2015 Norway reached the milestone of 50.000 new registered BEVs. The Government and the politicians had given a strong signal by signing international agreements indicating they wanted to proceed towards achieving their long-term goal of 85

g/km by 2020, and the economic incentives for EVs were extended till out 2017. During this phase BEVs got 25% VAT exclusion on leasing cars and the market share of BEVs just continued to increase rapidly. The weight deduction on PHEVs increased from 15% to 26% and as a result the sales skyrocked, making the PHEV a very popular choice. The new EV models that were hitting the market had become better and more advanced with more space and longer range, making them now comparable with traditional ICEVs. Suddenly, the demand for EVs was so high that the car manufacturers had trouble delivering cars to the Norwegian market.

The forth phase is the time for change and the new Government's proposals to the 2018 state budget regarding EVs was published, suggesting changes to the incentive scheme. Nevertheless, the Norwegian Government decided to keep the purchase incentives for ZEVs until the end of 2021 in order to motivate the car manufacturers to keep on providing the market with the right kind of products and services to the Norwegian consumers." The National Transport Plan 2018-2029" was presented with the overall and long-term goal of transport policy, where ZEVs was stated to be the biggest potential. A long-term goal has been set by the Norwegian government and Norway is on its way into a new phase called "EV boom" with brand new technology.

6.2 Market Development: Introduction of e-mobility

Governments all over the world tries to support the transition to electric mobility. Currently, the market structure benefits conventional cars and consumers are not quite familiar with EVs and the technology. Many have never driven an electrical vehicle or even considered to buy one. The introduction of electric mobility is a multiplex and unpredictable process which does not occur all by itself. Also, EV technology requires extensive investment by the government subsidising the technology, car manufacturers producing and developing the technology and not to mention the consumer. EVs have been until recently in Norway, an expensive and risky purchase for the Norwegian consumers and produced a lot of uncertainty. Regardless of the fact that the EV market in Norway is starting to get developed, it was for a period still fragile and uncertain and could easily have broken down during the early stage. That is why it has and still is so important for

the EV policy and its incentives and measures to be extended during this phase. According to Steen, Schelven, Deventer, Twist and Kotter (2015), one of the possibilities to overcome the problems of an emerging market is governmental action with an array of policy options for governments to support the EV introduction. However, in order for the EV to get a foothold in the market, it must first be interesting enough for the consumers who have an economy and a life situation that allows the risk involved in investing in this new technology (Fearnley & Erik Figenbaum, 2016). Hence, EV incentives can trigger substantial sales effect and help the technology into the market and make it up and go in an early phase.

6.3 Rules of the game

6.3.1 EV incentives and effectiveness

The study of Figenbaum and Kolbenstvedt (2013) shows how the way to sustainable technology begins by being captured in the market by innovators and early users. It is their use of this type of technology that contributes so that the early and eventually the late majority of EV buyers will look at the EV as an appropriate alternative. The main reason for combining EV benefits in a package is according to Fearnley and Figenbaum (2016) to achieve a greater effect, that is, greater market share. Also, EVs have been facing problems with unsustainable technologies and related barriers, and at the same time that it has been required an overall improved ecosystem for innovation in vehicle technology and business models. Hence, EVs rely on a mix of regulatory and government measures for their development (Steen et al., 2015). It has been concluded in a numerous of studies and surveys on the Norwegian EV policy and its incentives that the national and long-term incentives in Norway is in fact effective. It is also the main reason why Norway has achieved the EV market it has today. The development in the Norwegian EV market has been quite efficient, which also means that it has had a number of rapid changes along the way. Nevertheless, the EV policy and incentive program has not been the sole reason for this achievement.

6.3.2 Norwegian EV policy

According to North (1990) it is the institutional incentive structures provided by the government that determines how the rules of the game evolve and changes. In

Norway, the incentives were at first meant to support the Norwegian EV industry by making the EVs cheaper to purchase and use for the Norwegian consumers. When this failed the government decided to keep the incentives in an attempt to attract the international car manufacturers and the development of EV technology in the Norwegian market. Continuously, when the emerging Norwegian EV market started to evolve, new incentives were given to EVs in order for them to survive and get to a competitive point where they can compete with petrol and diesel cars. The incentives have been extended to maintain the interest and increase the demand for EVs among the Norwegian people. Keeping the incentives for so long has also given the car manufacturers a reason to allocate a significant number of their EV production from the factory to Norway, increasing the supply on the Norwegian market. Intentionally to ensure car manufacturers that there is a potential and actual market for EVs in Norway. Government priorities has been to drive innovation and EV technology development, increase competition and competitiveness, and attract new MNEs. Industry priorities has been to continue developing the EV product, factories and production processes. This has formed the basis of exchange between the government and the car industry. The outcomes of government-industry exchange are increasing convergence of interests where the purpose of the rules of the games is production and innovation. EV policy can have long-term effects that can change the EV market.

6.3.3 Common goal

In 2007 there was a game changer that gave a different meaning to the rules when new international agreements were signed and a new goal was set with a perspective towards climate. The rules of the game in the Norwegian EV market has been developed from economic and political context and types of exchanges between the Norwegian government and the international car industry. The political context of the Norwegian government used to be more industry-oriented, but has now become more market-oriented. Usually car manufacturers and other actors have their own interests, where they consciously drive co-evolutionary processes through certain initiatives. In the Norwegian EV market case the car manufacturers and the Norwegian government has the same goal to achieve: to

electrify the transport sector and to reduce overall GHG emissions. The co-evolution-cooperation is the driving force that changes the market.

6.3.4 Norwegian EV market

The Norwegian government has made decisions that were towards car manufacturers' interest and are depending on them to continue developing and producing EVs. The car manufacturers, in turn, are depending on the Norwegian government to provide and maintain the incentives for EVs in order to get the Norwegian consumers to buy them. Norway is relying on the car manufacturers' product and technology development to increase the volume of EVs in order to reach the 85 g/km target within 2020. New EV technology has become priorities for both players and there are signs of co-evolution in the Norwegian market. The relationship between the Norwegian government and the car manufacturers build an arena of mutual influence where the limits of government enforcement are depending on the car manufacturers' economic power to invest in research and further development, and that their power is conditioned by the power of the governments to motivate the EV business and its competitive advantage in the Norwegian market. The economic incentives make the EVs competitive in price.

6.4 How the Norwegian regulations influence car manufacturers

6.4.1 Market entry and market strategy choices

Local incentives can influence the demand for EVs relative to where in Norway they apply and which consumers that are being affected by these incentives. Car manufacturers observed that the various incentives had a significant effect on sales in different ways and places, for example, that the access to public lanes had played an important role for those customers living in Oslo and Akershus. The car actors based on this, regardless of whether they were already or newly established in the Norwegian car market, had to make decisions on how they would enter the EV market, which also included their market strategy. The car actors had different strategies of approaching the market due to the local incentives that showed greater demand in the bigger cities in Norway, such as Oslo, Bergen, Trondheim and Stavanger. A common experience for the car manufacturers was that the price of EVs was very beneficial for all consumers independently of where they lived in Norway due to the tax and fees incentives. The EV market in general is very price

sensitive and EV technology is still quite new and unfamiliar for some consumers. This is also the case in the Norwegian EV market, something that many of the car actors got to experience when they launched their first EV on the market.

Nissan faced challenges due to an early market where the EV product itself was too new and their dealers were not familiar with how to handle an EV or how it functioned. Nissan had to invest a lot of money and time in order to teach their dealers so that they really knew the product and how it worked so that they could give the right advice to those that considered buying an EV. VW also experienced similar challenges, but they were more prepared for it due to their entrance on the EV market being a couple of years later than Nissan's. Essentially, has this been a learning process where car actors have had to try and fail due to an early market and early phase in the EV technology development. As the EV market has become more established, it has gradually moved towards an adaptation process of the product and the further market development.

6.4.2 Product development and brand identity

As the Norwegian EV market has become more developed, Norwegian consumers are more familiar with the EV concept, and changes in car manufacturers' strategy and product development has made the EV more similar to a conventional car, the demand for EVs has increased tremendously. Norwegian people have EV fever and everyone wants one. The result of the success in the Norwegian EV market has been that the demand exceeds the supply. BMW, VW, Nissan, Tesla, Renault and X number of other car actors have had and still have long waiting lists on their EVs already released on the market and those that are coming in the upcoming years. For example, BMW have over 30.000 Norwegians waiting for an EV they do not know what looks like or what the price will be. Also, as soon as VW's factory opened up to submit orders on e-UP and e-Golf, the Norwegian VW group reported extremely high and ambitious numbers, even so high that the factory hardly believed it was possible, but they sold away in the Norwegian market.

As a direct consequence of the increasing demand for EVs the brand identity of the many major car manufacturers has weakened and they are now in a situation

where brand identity does not mean as much as it did before. Norwegian consumers are in a position where they just want an EV. How it looks like is not the first priority and the delivery time has become significantly more important if not the most important criterion. Hence, the brand identity does not mean that much anymore, but so does the deliverability, which has become the alfa omega on EVs. The Communications Director in BMW said that 80% of those that buys i3 in Norway are first-time buyers of BMW. He also acknowledges that it is not everyone who comes to them to buy a BMW i3, but to buy an electric vehicle. The use of branding and status has been common in the conventional car market, where well-known and established car brands would have an advantage over the smaller newcomers. In the EV market, on the other hand, has this differed greatly and says something about how the market has evolved and changed in just a decade, and the scope of the Norwegian EV market. Toyota and Nissan were early movers with hybrids and EVs and has thus brand established themselves in the Norwegian market. Weakened brand identity, deliverability and the whole EV product package to the right price are all consequences of market developments in the Norwegian EV market.

6.4.3 The importance of the Norwegian market

Norway has a major role as a pioneer country. Most car manufacturers like Nissan, BMW, VW and Toyota says that the Norwegian EV market has played a significant role in order for them to get where they are today, but not alone. Norway's market share is high, but they do not have a volume that is significant enough. Norway as a learning platform has been very important, although what happens in the Norwegian market or what Norway decides to do in the next few years is not crucial for a large concern, such as VW or BMW. On the other hand, Norway shows that it is indeed possible to achieve this for a small market as them with such a modest volume and thus, they can help to push other countries in the right direction.

Norway has also been important for the car factories as a learning market and that is perhaps the most important contribution. Several factories from the respective car brands has come to Norway and performed pilot studies, learned from them and conducted a lot of customer surveys. VW has invited hundreds of Norwegians

to come down to their factory to have a look at the production and listened to what they think of the different models. Norway has been seen as a very innovative car market and the factories of VW, BMW, Nissan and Toyota to name some, have visited Norway several times including top management, to learn about what is going on in Norway.

The Norwegian EV market has however had a great significance on Nissan's global strategy. Norway is a small market, where normally only a small part of the production of EVs would be sold, but in Norway the proportion is large (about 20% of the total car market is BEVs). The Communication Director of Nissan Norway says that if they did not have such markets as in Norway then the global development would have been much slower. There are around 100.000 leafs sold in Europe contra 300.000 globally, where close to 50.000 of them has been sold in Norway. Nissan's last launch of the upgraded leaf in 2013 went over 3 weeks and were placed in Norway, where the whole European press corps were flown in, sending out an important signal to the rest of the world. Nissan also decided to have the European launch of the new leaf in Norway, which was a great deal both to them and for Norway. Jaguar decided recently to have the world launch of their new BEV i-Pace in Oslo at the same time as the main launch were in Graz in Austria. Jaguar reasoned this decision by identifying Norway as the largest unconditional market for BEVs (Olsen, 2018).

The Norwegian consumers have first-hand knowledge and experience with the EV's characteristics and design due to a market that is 5-10 years ahead of the others. The Norwegian consumers, as early adapters, possess a lot of valuable user knowledge which is unique and worth sharing. However, this is on the use and not necessarily on the product itself. New services for EV owners is increasingly required and this combined with the Norwegian knowledge can be exported to new and growing EV markets. Nevertheless, have car manufacturers had the opportunity to learn from Norway, which enables the car manufacturers to get on a faster track themselves. In this way, has Norway had a significant impact.

It would be fair to state that Norway has contributed to a lot of the pressure and volume that we are now experiencing in the EV industry. BMW had a goal of

selling over 100.000 new rechargeable or electrified cars on the global market last year, where the Norwegian market accounted for 10% of it. This pretty much sums up how important Norway is when they take one-tenth of the production on the electrified cars from BMW. The Communication Director of BMW, Marius Tegneby, says that there simply is not enough production of EVs in the world today to supplement the Norwegian market.

6.5 How the Norwegian EV market influence Norwegian regulations

6.5.1 Changes in strategy and product development

Changes in car manufacturers' strategy and product development has resulted in an increased volume of EVs in the Norwegian EV market due to a combination of increased electric range, improved design and still favourable benefits for the purchase and use of EVs. The high market share of EVs in Norway might be explained by EVs now appealing to the early majority of EV buyers and not only innovators and early users. The incentives contribute to EV sales within all income groups. An interesting observation is that the BEV sales have increased significantly from 2011 without the introduction of any other new incentives. From this, one can discuss that there has not been a lack of incentives that have limited the sales of BEVs previously but most likely the lack of choices of good cars and models. Fearnley et al. (2015) identifies technology development as the key to increasing the market share of EVs. In fact, the technology and development on the supply side might be a stronger market driver than the public EV benefits in the future. This particular applies to battery technology and electric range, price-development and the selection of car brands or models. Such developments on the supply side will not only benefit the Norwegian EV market, but also work globally. This is why it is so important to drive innovation and support the EV technology development.

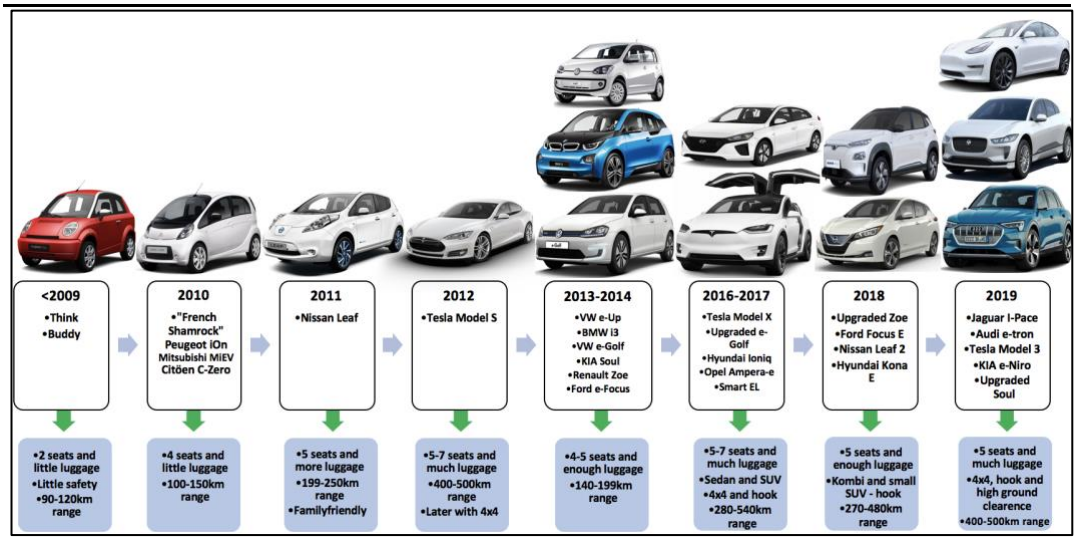

Figure 7: The Evolution of the EV.

* See Appendix 3 for full size.

6.5.2 To follow or be followed

Strategic decisions made by some car manufacturers affect the other car actors, which has an impact on the global market and hence, the Norwegian EV market. Tesla has for example been ground-breaking in terms of technology, where they have thought differently than the other car actors, thus pushed them to follow their innovation. The competition intensity of EVs has increased significantly and several car actors have released their own EV resulting in a broader selection of models increasing the competition among the actors in the market. This contributes to push the prices down, which means that EVs eventually will become more competitive against fossils cars. Several car manufacturers have realized that e-mobility and electrification of the car park is the future and the long game. Toyota has for a long time said that hydrogen is the future and invested heavily in R&D within this area, but in recent times have even they admitted that they also need to see BEVs as an alternative. Toyota is one of the very few car manufacturers that has been working on a platform that can produce both BEVs and Hydrogen vehicles. Toyota has been in the game with hybrid cars for over 20 years now and is the brand it has been sold most electrified cars of. They have achieved a competitive price level on their hybrids compared to other EV types, such as PHEV and BEV.

Also, another trend among the car manufacturers that has emerged is the cooperation between the producers. The EV market is very capital-intensive in

terms of R&D and several car manufacturers have decided to enter this market. It is, as mentioned earlier in the discussion, very expensive to drive innovation and product development of EV technology. Increasingly, car manufacturers must cooperate as it costs so extremely much to develop on their own. Hence, car manufacturers collaborate a bit crosswise these days. According to the Communication Director of Toyota, is this the new trend in the car industry and that it is in fact the collaboration that makes them come faster and can share the cost of development. Historically, has Toyota not been so inclined to cooperate. Communication Director of BMW also confirms that the car industry is in a new and exciting period, where EV is just a small part of it. This is about restructuring of the industry at the dealer level and factory levels, cooperation that we have not seen before and new actors.

6.5.3 Bigger international perspective

There has been research on how financial incentives and other socioeconomic factors influence the ongoing EV market adoption, where the effectiveness of EV policy is discussed (Duarte & Rodrigues, 2017; Steen et al., 2015) Hierarchically, there is the level of global agreements, such as the Paris-agreement with a common climate goal in the European Union, which also concerns Norway as a EEA country. The European Union is an integrated market with different levels of trade alliances and mandatory standards concerning emissions for vehicles and urban air pollution. Recently EU decided to introduce a new driving cycle for type-approval of new vehicle models (passenger cars), WLTP, which among other things measures CO_2 emissions. This will replace NEDC, which is the current driving cycle and it will be stricter and harder to achieve for the car manufacturers. EV policy is a multi-level policy game, where policy makers continuously have to take into account and operate within frameworks and changes decided elsewhere. Hence, there is a bigger international picture in the Norwegian EV market case, which have significant impact on the market and the tax regime (Steen et al., 2015). Car manufacturers' strategic choices and institutional perspectives can in other words be combined effectively in the sense that both parties wish to drive EV technology forward and to move towards a greener shift in the transport sector and meet the requirements.

There are many regulations in the EU that are crucial to the car manufacturers making them now changing course. Especially the requirement of 95 grams of CO_2 per kilometre of the fleet average to be achieved by all new cars by 2020 (EC, 2018). If they do not meet this requirement then they will get fines that might potentially be so enormous that they will really struggle, we are talking about fines in the billionth class. This has meant that many of the car manufacturers have had to do a complete turnaround on their model program in a short period of time. Especially the German producers will struggle if they do not have zero-emission vehicles (ZEVs) or PHEVs that can lower their average. It is a very important economic driver for the car manufacturers.

6.5.4 Aggregated volume and its challenges

The Norwegian EV market is a great success and shows a positive development, but it costs a lot of money to exercise such EV policy. Norway are experiencing high aggregated volume in the Norwegian EV market and with that follows challenges that might change the conditions for Norwegian regulations in the near future. Norway is one of the countries with the highest tax systems for vehicles in the world, and that is the reason why Norway have had the opportunity to lead such EV policy and subsidies the incentives. In general, have the car taxes contributed quite well to the Norwegian Treasury, so if the state still wants to bring in as many tax billions based on vehicles, as they have generally done in the recent years, then they have to start adding taxes on EVs eventually.

Most importantly is the economic cost associated with the EV policy. If Norway is supposed to only sell ZEVs from 2025, the state will lose huge incomes. Norwegian politicians have realized that they must prioritize differently in the future, considering the upcoming government budgets in the next few years. Especially now with lower oil revenues and less room for action. There are high socioeconomic costs associated with the tax exemptions for EVs. The Ministry of Finance (MF) has calculated how much revenue the state miss through the EV incentives, and it sums up to around 5 billion NOKs per year (MF, 2017b). The calculations are summarized in the MF's letter of notification to ESA from November 2017 and an overview is also presented further down in this section. EV Researcher in TØI, Lasse Fridstrøm, says that Norway does not subsidies EVs

more than the other countries in terms of the VAT exemption, but that Norway stands out by taxing petrol and diesel cars harder than any other country, with the possible exception of Denmark (Akerbæk, 2018). Overall for 2017, did the calculations for the estimated loss of government revenue due to economic incentives for EVs look like this:

Type of tax incentive:	**Amount in NOK:**
VAT exemption	3,2 billion
Exemption from one-time fee	700 million
Reduced annual fee (now exempted from 2018)	300 million
Reduced company car taxation 50% (now reduced to 40% from 2018)	155 million
Exemption from fuel taxes	621 million
Exemption from toll fee	700-800 million
Exemption from ferry payment	2,9 million
Total	**5,7789 billion***

Table 2: Estimated loss of government revenue due to EV incentives.
Source: MF, 2018 and Akerbæk, 2018. *including the highest estimate of toll charges

The Norwegian government uses taxpayers' money to subsidies the EVs. The Communication Director of Toyota thinks that the government should try to gradually phase out the tax exemptions on EVs and do it in a sustainable way so that it is possible to safeguard the welfare society and also have a balanced and correct competition in the market. Another consequence of the increased volume of EVs is the challenges of reduced capacity on the public lanes. Despite the government's decision to introduce carpooling requirements in 2015, it is just a matter of time before there will be too many EVs using the public lanes going beyond public transportation. This issue and the duration of the various incentives has been frequently discussed and most discussions have more or less come to the same conclusion that it is most likely this incentive or the exemption from toll roads that is the first to go (Fearnley et al., 2015).

6.5.5 A global shift towards e-mobility and the importance of China

Other countries are also taking a serious stand when it comes to the climate crisis. On September 11th, 2017, the Chinese Industry Ministry stated that they are

working on a strategy in order to forbid ICEVs completely, which is predicted to happen before 2040. As of 2019, 10% of all new vehicles that are sold needs to be ZEVs or run on biofuel and in 2020 the quota will increase to 12%. Those car manufacturers that does not meet or follow the requirements will have to pay large fines (Busch, 2018). China is the world's largest vehicle market in terms of volume and are now taking a serious shift towards an all-electric future, informing that they will invest heavily on EVs targeting annual sales of 2 million EVs by 2020. Already now in 2018, are the Chinese market on track of buying more than 1 million EVs with a 53% growth in sales in 2017 (Busch, 2018). The Chinese government is also warning about strict restrictions on petrol and diesel cars in the future. Hence, if China implement a complete ban on sales of ICEVs and focus on more climate-friendly solutions, then there is reason to believe that the rest of the world will follow. Also, both Great Britain and France has declared that they want to forbid and stop the sale of new ICEVs by 2040 (Sveen, 2017).

China's commitment to electric mobility as the world's largest vehicle market will have a crucial impact on the global EV market and also speed up the EV adoption. In China, we are talking about such a large volume that the car manufacturers will just have to adapt to the requirements of the Chinese government. Thanks to government subsidies, several local car manufacturers have done well in the Chinese EV market. There is a resurgence of manufacturing in China, where among others, BMW, Volvo, Volkswagen and Audi, will move their EV production to China. As China's production process speeds up, technology costs will fall, meaning cheaper production, higher volumes and lower purchase prices on EVs. The purchase price is utterly crucial in any EV market and China can be decisive in order to get a competitive price on EVs even after the economic incentives are phased out. In contrast with Norway, has China pioneered the mass development of public charging stations, installing 6000-8000 new charging piles each month, with 214.000 already installed in 2017. The Chinese government are expecting to have 500.000 public EV charging stations within 2020 (Babones, 2018).

6.5.6 Lobbying and influencing work

The business community has become more dependent on lobbying directed to the government in order to survive due to rapid changes of framework conditions with subsequent changes in the market as a consequence. The goals of lobbying are to influence the government and its leaders and lobbying activities. Lobby activities is when interest associations, firms and press groups try to influence politicians and other decision makers in the state, as well as affect the shaping of public policy. Hence, lobbying can be seen as strategic political communication, meaning that the political communication is targeted. One should know what to achieve, who to turn to and how to be perceived.

NGOs are non-profit organizations that operates independently of the government, usually addressing political and social issues. NGOs, such as NEVA and NAF have played an important role in the process of developing the Norwegian EV market. NEVA is operating with strong lobbying, representing the interests and concerns of their 50.000 Norwegian members and EV owners. NEVA is a member organization aimed at promoting e-mobility with energy efficient vehicles powered by electricity from renewable energy sources. They are 13 employees which have been doing information and influencing work on behalf of their members, the press and politicians for many years. NEVA was one of them who seriously worked against some of the suggestions from the government regarding changes in the EV policy, where they suggested to introduce a so-called "tesla fee", a one-time fee on heavier EVs. NEVA's influence work together with the support from the Liberal Party and the Christian Democratic Party made sure that this suggestion did not pull through in the final decision. NAF is a Norwegian association of car owners and the Nordic region's largest interest organization, which aims to take responsibility for the environment through its social and influence efforts.

All of the car actors are working with the Norwegian Automobile Importers Association (NAIA) who cooperate with the Norwegian Motor Trade Association (NMTA), which also is considered to be an important group that are often included in various hearings and get to hold presentations. NAIA is a gathered Norwegian car business, which is the Norwegian car importers' industrial and

interest organization, currently having 25 members. NAIA safeguard the common industry interests towards the Norwegian government and politicians. NMTA is a nationwide interest organization for new-car dealers and workshops. NAIA works to renew the Norwegian car fleet and influence the government to turn the vehicle tax regime towards stimulating new, environmentally friendly vehicles to become more favourable to purchase and use (NAIA, 2018). NAIA is involved in the process of supplying the government and relevant authorities with facts and suggestions for solutions for the future in the public debate. NAIA has a strategy group that frequently discusses questions as, how quickly the changes are in the car industry? What technologies that come first, when and how? What will be the next major breakthrough?

Several studies of corporate co-evolution on pro-action by firms have commonly considered the growth strategies firms have acquired in their marketplaces instead of considering how they relate with institutions and governments (Burgelman, 2002; Child et al., 2012; Santos & Eisenhardt, 2009). In the case of the Norwegian EV market it shows that firms are indeed able to influence governments or institutions. The most important job the car manufacturers can do for the politicians and when it comes to lobbying activities is to base everything on facts and actual numbers. Nissan is currently working together with Zero in order to improve the arrangements on commercial vehicles, since the VAT exclusion is not working, to make them more attractive. They also worked a lot to highlight the differences between PHEV and BEV to point out that the actual emissions of CO_2 were in fact much higher. The result of this and after a lot of dialog between relevant parties was that the weight exemption was reduced from 26% to 23%. VW has had its board in Norway and discussed the future with different ministers. The Communication Director of VW, Anita Svanes, says that one of the most important thing they can contribute with is sharing their knowledge with the politicians regarding what is coming in the future since they also have the prerequisites for knowing what is real. VW and other car manufacturers are showing them what they know is coming from their factories of new technology and inform them about how they think the market will develop. Also, talking about different segments and contribute in different ways in order to give them some predictability so that they can relate to something that is real. This is how

the politicians can base themselves on our production plans and know the difference between different types of technology. It goes much on sharing knowledge and that there is an openness and open dialog between us and the public authorities.

Toyota have stepped into the role of influencing and have arranged many meetings with politicians and ministers. It has been very important for Toyota to tell about the road ahead, how they see the technology development and how they look at the various benefits that the Norwegian market has. Toyota started with hybrids in Norway in year 2000, when the technology was more or less new and did not have many economic benefits. Toyota Norway then started to work against and with politicians in order to give the technology some help in the beginning, resulting in the weight exclusion of 5% and later got increased to 10%.

When PHEVs was released in 2012 they had the same benefit of 10% weight exclusion as a traditional hybrid. Toyota together with other car manufacturers thought that the PHEVs should have a benefit that was greater than the hybrid since they release less emissions. The result was an increase in the weight exclusion to 15% which was considered to be within the limits of technology neutrality making the prices more or less similar. For some reason, the politicians decided to adjust the weight exclusion rate up to 26% resulting in a massive sale of PHEVs. Toyota, Nissan, NAIA and NEVA did not agree that this was a wise decision and that it was too much. When the documentations showed that the reality was somewhere between 12-20% real weight for the components the result was that PHEVs was overcompensated. Nissan, Toyota and NAIA made it clear to the politicians that they should act on this and change the tax calculation for these vehicles based on facts. The result was as mentioned above that the weight exemption was reduced from 26% to 23%, where it only gets full weight exclusion if the electric range is more than 50 kilometres.

When the government last fall said they wanted to remove the reduced company car tax of 50%, VW was one of them who said that this was unwise and argued that this was the only benefit that the company car users had to choose an EV instead of a regular fossil car. Normally a company car user gets the fuel covered

on a company car, in the EVs case the user have to charge at home or at work and does not have other types of incentives. VW pushed this matter and referred to statistics together with NEVA pointing out that it was important not to lose the EV share that was around 20% in terms of those who choose an EV as a company car. They also showed the politicians that this share was currently increasing now when e-Golf came with a longer electric range. VW and NEVA convinced the government that the company car tax was important and thus, they decided to keep it but it was reduced to a rate of 40%. In the Norwegian EV market case it demonstrates that it is necessary not to just have the relevant power resources, but also know how to use them. For the government and politicians to have an open dialog with car manufacturers, NEVA, NAF, BIL, NAIA, NMTA, other interest groups and relevant influencers has been the key to many wise and efficient decisions. It also recognizes the role of strategic choices of individual firms and external organizations.

6.6 How uncertainty will influence the future EV market in Norway

Although there is a major technology development going on, the EV market is still vulnerable to uncertainty, especially by the consumers (Van der Steen et al., 2015). The incentives related to fixed costs and particularly price-reductions at the time of purchase are critical to many EV buyers. Results from a survey conducted by Kantar TNS (Andersen, 2017) shows that the car is very essential for Norwegians and one of the most important things they own. Many of them are using the car when travelling to work or school and the numbers to Kantar also shows that people most likely will use the car as much in 2025. Hence, the car itself is of high utility value for the Norwegian people and there is a high risk associated with it. In Denmark, one-third of the steering-instruments in the EV value chain is downstream and thus, most of the measures and incentives in the Danish EV policy is focusing on consumers (Steen et al., 2015). When the Danish government decided to phase-out the re-registration fee exemption on BEVs in 2017 the Danish EV market stopped and the EV market share dropped drastically. Tesla then decided to pull out of the Danish market. The consumers were directly affected by the sudden turn of event. Norway is a country that also target the downstream (consumers) of the EV value chain.

Another example where uncertainty associated with regulatory changes might have consequences for the market is the diesel car in Norway, which have made the Norwegian people sceptical. Chief Editor of Dine Penger, Tom Staavi, was particularly concerned about the economic uncertainty that people experienced during that period. In an article in VG (Nervik & Larsen-Vonstett, 2012) he said that fees must be predictable. Changing government fees and maybe refusing people to use their car in some circumstances can cause the car to fall faster in value. It can go directly beyond their private economy, Staavi said then. This is somewhat relatable to the BEV phenomenon taking place in the Norwegian market, where the Norwegian tax system is used to make EVs economic beneficial to purchase and to use for the Norwegian people. Pushing people in the direction of BEV regardless of whether it is an BEV they want or not right now. Many of the Norwegian consumers could refer to this when the milestone of 50.000 EVs was reached much sooner than anyone would have thought. The Norwegian EV policy is entirely dependent on the signal effect of politicians being maintained. They need to be clear and consistent, then they will not end up in the same position as they did in the diesel case creating a lot of uncertainty among the Norwegian consumers. The market development might stagnate if politicians pull out the plug too soon.

6.6.1 How uncertainty regarding previous EV policies has influenced car manufacturers

In the last couple of years has car manufacturers noticed more uncertainty among the Norwegian consumers. Although the incentives are still running throughout year 2021, other important questions and topics has come up and been frequently discussed. The ownership of the car itself is one of them and what the need of owning its own car will be in the future? The sharing economy trend has begun to plant roots in Norway. This is a business model, where private individuals sell services or rent out assets either directly or through intermediary companies, such as car sharing, carpooling and hiring out vehicles or vans. Nabobil is an example on car sharing service and Airbnb an example on private rental of your residency, which both has become quite popular and common in Norway. Other questions would be what type of cars are coming in the nearest future? What type of car should one choose, EV or PHEV? Is it really just ZEVs in 2025 or is it space for PHEVs as well? The car manufacturers are not quite sure about the direction the

politicians really want to go, which is frustrating for them and the Norwegian consumers. Also, when it is time for the incentives to be phased-out where will the fees and taxes be placed? Will it depend on the use of the car or depend on what type of car it is?

All of these questions and the uncertainty relative to taxes and fees or potential zero-emission zones makes Norwegian car buyers more careful now than before. Many of them are also waiting for the new BEVs that are coming in the next few years. This have made the private leasing concept more common and a popular choice these days. Then the customer only need to relate to the monthly payment and after ended leasing period the responsibility and risk is on the dealer and not the consumer. Leasing is a good choice and the 25% VAT exclusion is helping consumers to choose an EV in the mean while. Consumer economist, Magne Gundersen, believes that there will be further growth in private leasing as it is perceived as safer and much more predictable especially now when there are major and rapid changes in technology and tax policy (NAF, 2017). None of the car brands interviewed had any examples where they have done changes due to the uncertainty in the Norwegian market necessarily, but that they are thinking about the effects in a long-term perspective.

6.6.2 How the uncertainty around new EV policy influence the future EV market

The speculations about the future car industry together with mixed signals from the Norwegian government are creating a great deal of uncertainty. At the time of writing, is there still uncertainty regarding how the new driving cycle WLTP will affect the calculation of the one-time fee. However, it is likely that it will lead to an increase on some models, which is impossible for the car manufacturers to say per now (NMTA, 2018). This means that the agreed purchase price might increase significantly in the period between ordering and delivery. The car manufacturers hope that the government can come to an agreement and give them a clarification regarding this matter soon, since it is challenging for them when they now have some decisions to take, which applies to everyone in the car industry. Norwegians are starting to order new cars to be delivered in 2019 already and they do not know what to price them since the fees are still unknown. NAIA together with NMTA and NAF have worked intensively against the government and the

individual political parties to ensure a smooth transition to WLTP, where the most important thing is that new technology with actual lower emissions will not be punished. The phasing-in of tolls sooner rather than later is also an increased matter, which makes people concerned. NEVA is on this case arguing that this will stagnate the positive development that they have experienced so far in the Norwegian EV market. They propose a principle of escalation based on the realistic number of BEVs that crosses the toll roads. First when BEVs stands for half of the toll crossings is it reasonable to adjust it up to half price.

6.6.3 Future EV market in Norway and its challenges

Even though it seems that BEV is the future, many car manufacturers are still discussing Hydrogen vehicles. It has been discussed that it might be too expensive to invest in at this moment, but that there is progress in the research phase and that this potentially will be a better and more practical solution to solve the climate crisis and the high customer demands and requirements in the future. The car manufacturers have clear plans that are set, but they wish for more straight answers and not at least predictability. Predictability is the keyword and it is very important both for them delivering the EV product and for the Norwegian consumers who wants to buy or are thinking about buying the EV product. The success in the Norwegian EV Market is extraordinary, but at the same time, there are questions regarding how long these beneficial incentives and thus the high demand will last. There will be changes affecting the institutional environment (Norwegian EV market), but when will it happen and how will it happen? The market forces (drivers) in the Norwegian EV market has been and still is the EV incentive scheme and not at least a well-developed charging infrastructure. The market is developing fast with a combination of incentives ensuring a present market triggering demand and product development among car manufacturers.

6.6.4 The importance of promoting environmentally friendly transport solutions

Norwegian government and car manufacturers are committed to promote environmentally friendly transport solutions. It is important for the car manufacturers to continue developing the vehicles, which is a challenge big enough as it is and requiring a lot of them, both economically and technologically. Also, continue to have an open and informative dialogue with the authorities

sharing their knowledge and experiences is also expected of them. Furthermore, is it important that the government continue to expand and build out the charging infrastructure and open up for more available services, such as technology offered by the car manufacturers, and most importantly to give predictability. It is also suggested that the government should perform a gradual approach in terms of imposing fees and taxes on EVs and gradually phase-out the benefits of owning and using an EV. As a comment to this, does Toyota hope that the politicians continue to be positive to the concept of hydrogen and make sure that something actually happens.

7. Conclusion

The intention of this study is to explore the co-evolution in the Norwegian EV market. The findings show that the relationship between the Norwegian government and the car manufacturers build an arena of mutual influence where the limits of government enforcement are depending on the car manufacturers' economic power to invest in research and further development, and that their power is conditioned by the power of the governments to motivate the EV business and its competitive advantage in the Norwegian market. New EV technology has become priorities for both players and there are signs of co-evolution in the Norwegian market.

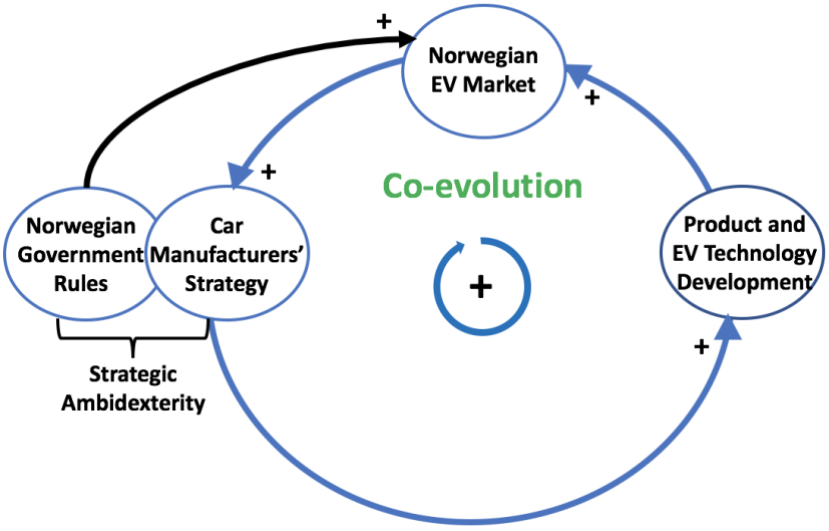

Figure 8: Co-evolution in the Norwegian EV Market.

The findings explore the mutual effects of the Norwegian government's and car manufacturers' strategies and the outcomes that comes from this interaction in different economic and political challenges. As the Norwegian EV market has become more developed and changes in car manufacturers' strategy and product development has made the EV more similar to a conventional car the volume of EVs in the Norwegian market has increased tremendously. The result of the success is that the demand exceeds the supply. Furthermore, as a direct consequence of the increasing demand for EVs the brand identity of many car manufacturers has weakened and does not mean as much as it did before and the delivery time has become more important. The BEV sales have also increased significantly since 2011 without the introduction of any other new incentives. From this, one can draw the assumption that there has been lack of good choices that have limited the sales of BEVs previously. The findings support the identification of technology development as the key to increase the market share of EVs, where in this case the technology and development on the supply side turns out to be a stronger market driver than the public EV benefits. Hence, car manufacturers' strategic choices and institutional perspectives can be combined effectively in the sense that both parties wish to drive EV technology forward.

The Norwegian EV market are experiencing high aggregated volume and with that follows challenges that might change the conditions for Norwegian regulations in the near future. This study shows how firms relate with institutions and governments, where the political perspective focuses on the internationality and power resources of relevant actors. In the case of the Norwegian EV market it shows that firms are indeed able to influence governments or institutions together with NGOs who perform strong lobbying and influence work. The findings also support that co-evolution takes place not only through learning, but significantly through the use of power and influence, where it is important to have an open two-way dialog and that mutual influence is accepted.

The interdependencies between the Norwegian government and the car manufacturers is somewhat diffuse. They are not necessarily dependent on each other in the sense of car manufacturers being directly affected by the Norwegian market. Nevertheless, the findings suggest that in order to reach a common

climate goal, a frontrunning country as Norway is important and that car manufacturers are indirectly dependent on the Norwegian market and hence, needs to relate to government regulations.

In this study, the researcher has identified a playing field where actors collaborate to achieve their interests and goals and also identifies the outcomes of the interaction between processes of change in the Norwegian market. Norwegian government and car manufacturers are both committed to promote environmentally friendly transport solutions. Uncertainty around previous and new EV policy is producing uncertainty among the consumers and has in fact an impact on the future EV market, which could have a potential effect on institution(s) and MNE's strategies. The findings sum up to the fact that The Norwegian EV market is indeed a result of the collaborative relations between the Norwegian government and the car manufacturers.

7.1 Theoretical contribution, implications and further research

This study builds upon existing literature, however there are few co-evolution studies conducted on this topic, which have concentrated on developed economies, such as Norway. In the study of Duarte and Rodrigues (2016) they examine the evolution of the emerging automotive industry in Brazil and its key drivers, where they argue that the rules of the game (industry polices) are an outcome of exchanges between the host country and industry and not a driving mechanism to perform co-evolution. The framework of Cantwell et al. (2010) is fundamentally sound, but it does not go deeper into the processes where co-evolution actually might appear and how this happens, which is elaborated on in this thesis. Child et al. (2012) gives a new theoretical and empirical insight to co-evolutionary development from a political perspective and focuses on the relations between firms and their institutional environments where strategic choice and institutions perspectives can be combined effectively. In this study, this argument has been taken into account. Generally, in co-evolution theory most of the attention has been given to external actors, such as institutions and how they enforce constraints on firms' strategy choices through compliance mechanisms and regulations. This research contributes to the literature on IB and co-evolution theory building from a political perspective and provides a better insight on this

topic by examining the dynamics that are driving and shaping the interaction between government policies and market strategies. It also clarifies how the interaction between political institution(s) and the MNE can over time affect the institutional environment and that these developments in fact can be viewed as an indicator of government policy effectiveness. The study also presents an understanding of the role of interdependence in the co-evolution of government and MNE strategies and the co-evolutionary process. Hence, new and qualified managerial and practical suggestions to government policy or policymakers and MNEs might be drawn from this study. This thesis might also be generalized in order to evaluate other types of product and technology development in other markets with a high degree of government regulation where one of the goals are to push innovation further.

The researcher came across several other interesting subjects that made itself noticeable and worth being looked into further. An emerging trend among the car manufacturers is the co-operation between the producers. The EV market is very capital-intensive in terms of R&D and several car manufacturers have decided to enter this market. According to the Communication Director of Toyota, is this the new trend in the car industry and that it is in fact the collaboration that makes them come faster and can share the cost of development. Co-evolution of firm strategies in the EV market might be a potential topic of interest within the literature to look closer at.

Also, the case of hydrogen cars is a good example where firms and the government needs to cooperate in order to stimulate the development of new technology and its markets. The development of the hydrogen car is depending on government subsidies in order to establish hydrogen stations so that the Norwegian consumers can actually use the car. This might be an interesting approach on a further political view of co-evolution.

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Appendix 1: Interview Guide

Interview Guide

Thank you very much for your acceptance to do this interview. As mentioned earlier, the interview will be used to support my master thesis about the interaction between car manufacturers and the Norwegian government in the Norwegian EV market - how it has become what it is today and how the uncertainty around new EV policy regulations might affect the future EV market in Norway. The interview is supposed to last between 30-60 minutes. The interview will be recorded if you agree to do so and all recordings will be deleted and destroyed after the completion of the study.

Part A: Background information

1. Can you please tell a bit about yourself (name, which position in company x, how long have you worked for them, any previous experience that may be relevant to this topic)?

Part B: Introduction part: the Norwegian EV market

1. How would you say that the conditions for EVs were 10 years ago?
2. What has changed since then?
3. What do you think has been the reason for the rapid changes in the Norwegian electric car market?

Part 1C: Have Norwegian regulations affected the car manufacturers' strategy?

Market entry and marketing strategy

1. How did you enter the Norwegian EV market (already established in Norway/newcomers)?
2. When did you introduce EVs on the Norwegian market and what was behind that decision?
3. Was there any doubt when you first made the decision to go electrically?

Product strategy

1. *Do you have any examples where Norwegian regulations have influenced model selection, product development or strategy in the company?*
   - Or examples of special Norwegian rules that have contributed to the development of Norwegian models / solutions?

Part 2C: What is the significance of the Norwegian EV market for car manufacturers' global strategy?

- In regard to ***testing products*** and using Norway as a learning platform?
- In regard to ***product development***, which means that the EV will eventually become more competitive against fossil cars?
- In regard to ***further research*** in EV production and other environmentally friendly projects?

Part D: Has the Norwegian EV market affected Norwegian regulations?

1. How have changes in car manufacturers' strategy and product development affected the EV market up until today?
2. Do you think this has a correlation with the EV policy now changing?
3. Will aggregated volume change the preconditions for regulations (bigger volume, more models, cheaper prices and more potential buyers)?
4. In terms of lobbying and influencing work: what do you do to "educate" politicians while gaining acceptance for your views?

Part 1E: How has the uncertainty around previous EV policy affected car manufacturers?

1. How did you experience the uncertainty around the 50.000 EV target that was reached much earlier than expected?
2. Have you noticed anything around the uncertainty among the car buyers over the last two years in conjunction with the incentives and EV benefits that was initially planned to be phased-out in 2017?
   - If yes, can you elaborate more on this?
3. Do you have examples of where you have made changes based on uncertainty or expectations?

Part 2E: How does the uncertainty around new EV policy affect the future EV market in Norway?

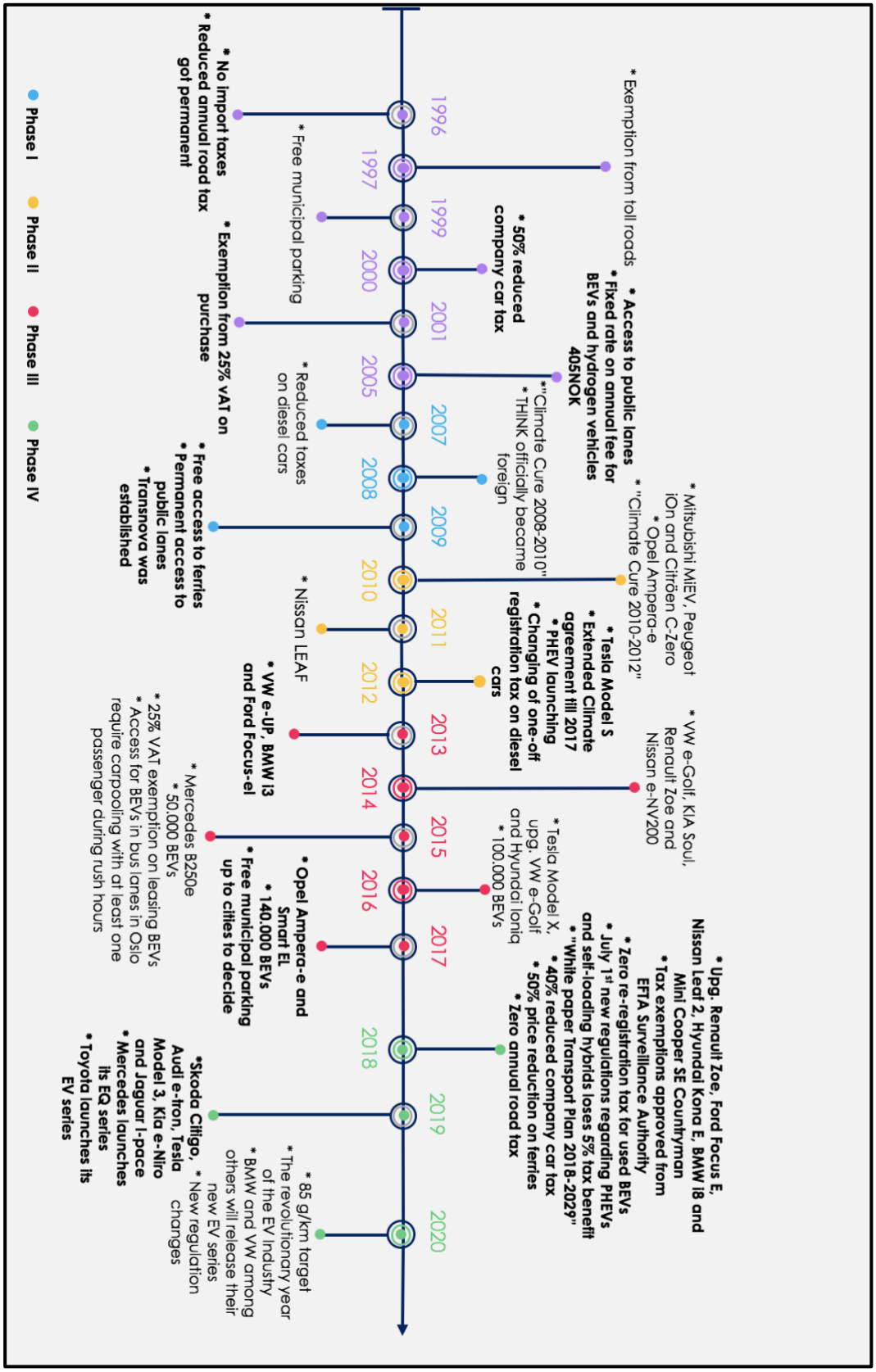
1. How do you care about the uncertainty that clearly is created around the future of the EV and its favourable advantages and incentives?
2. What would you say that the driving forces that change the EV market are?
3. What do you regard as important for promoting environmentally friendly transport solutions?
   - What can actors do?
   - What should the authorities do?

Wrap up - (active listening):

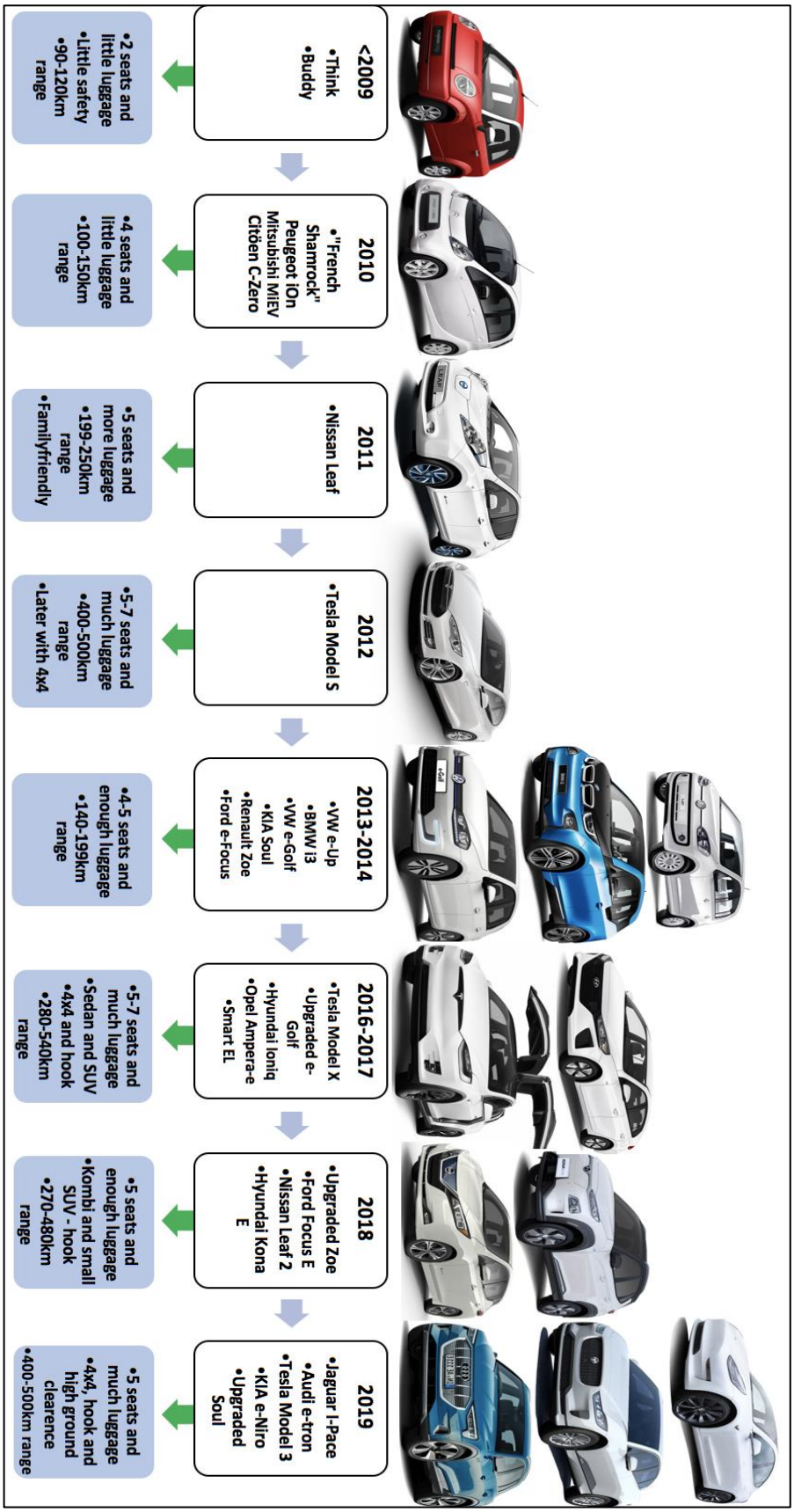
- Would you look at the development of the Norwegian EV market as a result of reactions and actions that have taken place between car manufacturers and the Norwegian government - Norwegian regulations versus strategy?

- Do you have more that you wish to add that you consider as relevant, which can contribute to this topic and in this way, strengthen the content of this master's thesis?

Appendix 2: Timeline – The Norwegian EV Market



Appendix 3: The Evolution of the EV



Appendix 4: Preliminary report

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1. Introduction

In today's market things are changing more rapidly than it used to and stabile conditions has become more rare. Firms are now more dependent on having a more dynamic business strategy in order to gain competitive advantage. A dynamic market is a market with rapid and often unpredictable changes to the competitive landscape. Location advantages such as a country's political and legal systems as well as its fiscal terms can be called dynamical location advantages. This means that the terms might change over time and will lead to changes for the firm. Norway changed their regulations and made the electrical vehicle (EV) an attractive choice for the Norwegian consumers who saw the economic benefit of changing from a high emission car to an electrical one. Today, Norway is one of the biggest countries in the world when it comes to the number of EVs per capita. The success of the growing EV market in Norway has been the result of the implementation of many incentives to support the EV technology and industry in order to reduce emission from road transportation. The signals that the majority of political parties have sent out to the public is that it should always be economically beneficial to choose zero and low emission cars over high emission cars.

Norway has without any doubts one of the best and most favourable incentives schemes for EVs in the world. The 85-grams/km climate target form the basis for the intense Norwegian climate policy and motivates the EV incentive scheme used as a measure to reach Norway's climate goals. In 2012 the Norwegian politicians agreed that the economic incentives for EVs would be extended till out year 2017. Norwegian politicians say that these incentives are important and necessary in order to stimulate innovation and further development in the EV technology industry, contributing to a critical mass. The success in the Norwegian EV Market is extraordinary, but at the same time, there is uncertainty regarding how long these beneficial incentives and thus the high demand will last. Norway reached their goal much faster than they expected and the increased volume of EVs is starting to bring up challenges due to, for example, capacity. The question regarding how painful the economic incentives will be for the Norwegian state has been brought up. Also, the discussion of how significant the EV incentives are for

further sales of EVs has been frequently discussed. The incentive scheme will from 2018 be revised and adjusted to the EV market's development in the coming years. The new governments proposals to the state budget for 2018 regarding EVs can have consequences for the future EV market. Many people have a strong opinion that the total in the Government's proposals in the state budget is going in the wrong direction. It is weakening the EV policy and the competiveness of the EVs instead of strengthening it. No one has thought that the EV benefits would last forever, but that the Government pulls out the plug to early and are giving mixed signals resulting in great uncertainty among the Norwegian people.

The development has been extremely fast and the EVs have become better and more advanced making them now almost measureable with diesel/petrol cars. Year 2020 is predicted to be the new year that will revolutionize the EV industry. Even though it seems like the EV is the future, many car manufacturers are launching plug-in hybrids (PHEVs) and are still discussing cars running on hydrogen. Some sceptics discuss that the future car industry will not even concern fossils, zero-emission, plug-in hybrid or hydrogen cars, but will be something completely different, for example, cars that runs on solar panel. The speculations about the future car industry together with mixed signals from the Norwegian government are creating a great deal of uncertainty among the Norwegian consumers. The uncertainty relative to taxes and fees or potential zero-emission zones makes Norwegian car buyers more careful now than before. Particularly now when there are major and rapid changes in technology and tax policy. How will the interaction between regulatory change (less demand) and technological change (cheaper cars – greater demand) be?

2. Research question

Norway has a high degree of government regulation, and new government regulation can be understood as a disruptive event, resulting in new rules that govern the market. The institutional environment determines the choices of the firm and political strategies. The researcher wants to look closer at the co-evolution of firms' and institutions' strategies and the potential outcomes that comes from this interaction consequentially. According to North (1990) it is the institutional incentive structures provided by the government that determines how

the rules of the game evolve and changes, and it is their actions and policies that regulates and attract the development of an industry or a market (Duarte & Rodrigues, 2017). In this case, the rules of the game are the Norwegian EV policy. The relationship between governments and firms build an arena of mutual influence where the limits of government enforcement are depending on the firms' economic power, and that the firms' power is conditioned by the power of governments to motivate or demotivate business opportunities and competitive advantage (Child et al., 2012). The researcher is interested in how the Norwegian EV market has become what it is today and how the uncertainty around new EV policy regulations might affect the future Norwegian EV market.

Hence, the research question of this thesis will be:

"*How does car manufacturers relate to the uncertainty caused by Norwegian regulations in the Norwegian EV market?"*

With the following sub question:

"*How does the Norwegian government affect car manufacturers' strategies?"*

3. Literature review

In this thesis, the researcher will use co-evolutionary theory in order to try to understand and explain the Norwegian EV market phenomenon. The history of the Norwegian EV market shows some patterns of co-evolution where the Norwegian government and car manufacturers has "worked together" in order to push and drive innovation and EV technology development. Hence, in order to address the research questions, the literature review will go over the literature on co-evolution. Co-evolutionary studies have recently started to refer to the political processes that might be involved where co-evolution appear, but most research and studies are done on developing countries with an emerging economy (Child & Rodrigues, 2008; Dieleman & Boddewyn, 2012; Duarte & Rodrigues, 2017; García-Cabrera & Durán-Herrera, 2016). Very little has been done on developed economies, such as Norway, but the principles of co-evolution are the same. Examining the dynamics driving and shaping the interaction between government

policies and market strategies, might contribute to co-evolution theory with a political perspective. The researcher also wants to clarify how interaction between the institution (Norwegian government) and the MNE (car manufacturers) over time can affect the institutional environment (market outcomes) in order to explain government policy effectiveness. Nevertheless, the researcher aims to understand the role of interdependence in the co-evolution of government and MNE strategies. Also, the co-evolutionary process, in which MNEs are involved, needs to be understood if the researcher is to make new and qualified managerial and practical suggestions to governments.

3.1 The role of the Government

The literature on international business (IB) has demonstrated how host country institutions can influence MNEs' strategic choice of location, entry and operational mode and performance through their government actions. Institutions are defined as formal and informal rules of the game, or more formally, the humanly devised constraints that shape human interaction (North, 1990). Rules govern the interactions of actors such as domestic firms, MNEs, civil society groups, and government bodies, which determines the organization of economic activities (Fligstein, 2001). According to North (1990) it is the institutional incentive structures provided by the government that determines how the rules of the game evolve and changes, and it is their actions and policies that regulates and attract the development of an industry (Duarte & Rodrigues, 2017). Institutional environment changes can be caused by, e.g., governments' regulations (Greenwood et al., 2002) and in the recent years, we have seen more direct governmental interventions in the business world (Duarte & Rodrigues, 2017). The relationship between governments and firms build an arena of mutual influence where Child et al. (2012), as mentioned earlier, suggests that the limits of government enforcement are depending on the firms' economic power, and that the firms' power is conditioned by the power of governments to motivate or demotivate business opportunities and competitive advantage.

3.2 Co-evolutionary theory

Institutional theory views organizations as embedded in institutional arrangements. The traditional IB view and organizational theory emphasizes the early approach of institutionalism that firms must accept and adapt to institutional

pressures if they wish to gain validity within any organizational field (Dimaggio & Powell, 1983). Recent IB literature on the other hand has proposed that firms co-evolve with the environment. The idea of co-evolution have its origin in biology as the idea of reciprocal evolutionary change in interacting species, where change in one species was triggered by change in another related species (Jiang et al., 2016). This concept was picked up by Lewin and others (Koza & Lewin, 1998; Lewin, Long & Carroll, 1999; Lewin & Volberda, 1999) and was applied to organizational theory. According to Lewin and Volberda (1999) co-evolution has the potential to integrate micro-level and macro-level evolution within the same unifying framework, combining multiple levels of analysis and contingent effects leading to new insights, theories, empirical methods and understanding. Co-evolutionary theory suggests that firms and their institutional environments influence each other over time due to the interplay between them (Ahlstrom & Bruton, 2010; Rodrigues & Child, 2003). It focuses on the dynamic interaction of forces in an organizational environment with the capacity of its leadership to respond to these forces, at the same time to shape aspects of the environment internationally (Child et al., 2012). Generally, previous literature suggests that co-evolution is the shared outcome of managerial intention, environment, and institutional effects. The purpose of co-evolution research is to solve mutual adjustment mechanisms (Dieleman & Sachs, 2008). Co-evolution theory has opened many arenas to explore the interrelationship between the interdependent actors further (Child et al., 2012; Child & Rodrigues, 2008), but the literature on IB has still paid little attention to the study of the process of co-evolutionary.

While evolutionary approaches deal with changes at industry/country or organization level, co-evolutionary theory attempts to identify the outcomes of the interaction between these processes of change (Pajunen & Maunula, 2008). The study of Cantwell et al. (2010) addresses this matter and suggest that the co-evolutionary theory need a conjoining framework that allows researchers to understand institutional change. They present an analysis that equally emphasis formal institutions (such as laws and regulations) and informal institutions (such as norms and values) as a source of uncertainty that confronts the firms. Hence, they developed a theoretical framework that takes into account the dynamic arrangement of the MNEs activities and the interplay between the activities and

the evolution of institutions internal and external to the firm. They also argue that a driving force in the process of evolution is how the MNEs adjust their strategies and organizational structure to count for uncertainty and complexity in the development of their own activities in their environment. Their study connects historical changes in the character of MNEs activities to changes in the institutional environment, and emphasizes the scope of entrepreneurship that might lead to co-evolution with the environment. Also, the role of institutions in the process of innovation enables a better understanding of the co-evolution between individual firms and their institutional environment. According to the Cantwell et al. (2010) the value-creating activities of MNEs over the past two decades have become more influenced by learning and innovation, and technological development, where the effort of creative search evolves over time. The framework is according to the authors making relevant conceptual and empirical contributions to international business and economics, political economy, sociology and organizational theory, to the extent that these are concerning the issue of cross-border institutional adaptation and co-evolution by MNEs (Cantwell et al., 2010).

The framework of Cantwell et al. (2010) have a good base but it does not go deeper into the processes where co-evolution might appear. We know that co-evolution can take place, but we know little about how this actually happens. The co-evolutionary studies have recently started to refer to the political processes that might be involved (Child & Rodrigues, 2008; Dieleman & Boddewyn, 2012). Child et al. (2012) gives a new theoretical and empirical insight into co-evolutionary development with a political perspective on corporate co-evolution. It focuses on the relations between firms and their institutional environments which builds on Oliver's (1992) insight that strategic choice and institutional perspectives can be combined effectively. Generally, most of the attention has been given to external actors, such as institutions, and how they enforce constraints on firm's strategy choices through compliance mechanisms and regulations (Kostova & Roth, 2002; Peng et al., 2008). However, Child et al. (2012) state in their study that firms are also able to influence governments or institutions. Several studies of corporate co-evolution on pro-action by firms have commonly considered the growth strategies firms have acquired in their

marketplaces instead of considering how they relate with institutions and governments (Burgelman, 2002; Child et al., 2012; Santos & Eisenhardt, 2009). A political perspective focuses on the internationality and power resources of relevant actors, and suggests that co-evolution takes place not only through learning (Boisot, 1998), but significantly through the use of power and influence. They demonstrate that it is necessary not just to have relevant power resources but also to know how to use them (Cantwell et al., 2010). It develops an understanding of political dynamics which have generally been unappreciated in co-evolutionary studies. It also recognizes the role of strategic choices of individual firms and external organizations.

The oil drilling in the Arctic is an example of co-evolution where the authorities and operators have been working together for many years to reduce the use and discharge of environmentally hazardous substances. In December 2015 world leaders, including Norway, signed the climate-agreement in Paris, which makes them obligated to certain climate requirements. The oil drilling in the Arctic will take place in ice-filled waters where it is dangerous, insufficient and difficult to handle oil drilling. The project's opponents such as Greenpeace and parts of the EU parliament claims that the technology is not yet at a level that makes it safe to drill for oil so far north (GN, 2017a, 2017b). The problem is that there is no method of cleaning oil in case of a potential oil spill in the Arctic, which will be almost impossible to control and it will happen in a unique and vulnerable natural-area. Although there is no knowledge or equipment to remove oil spills from ice, Statoil as the sole oil company, has secured licenses in all the Arctic states. Statoil and eight other oil companies on the other hand has believed since 2013 that the oil and gas industry is ready with the technology needed for oil drilling in the Arctic and contingency plans that are ready if there is an oil spill (Lewis, 2013). Recently the Norwegian government won the lawsuit from Greenpeace, allowing them to continue their plans for more oil exploration in the Arctic (Doyle & Solsvik, 2018). The role of the authorities has through several white papers set goals for what is considered as acceptable environmental impact from the oil and gas business (NEA, 2016). The objectives have been followed up by the authorities making demands through laws, regulations and conditions in the companies' licenses to operate oil and gas activities. Within these limits, it is up to

companies to look for, build and extract the resources that are profitable for the companies themselves and for society as a whole. The Environmental Directorate imposes strict requirements to operators and pushes the operators to develop new technology in order for them to meet their requirements.

In order to reach a better understanding of the relationship between the MNE and the environment it is necessary to use a more dynamic and co-evolutionary approach. The field-level conditions that drive MNEs to co-evolve are almost unknown. Field-level conditions are those that make the institutional environment unstable and easier to change (Battilana et al., 2009). Several circumstances, usually connected, can cause these conditions and can among other things involve, e.g., new regulations and institutional contradictions (García-Cabrera & Durán-Herrera, 2016; Wright & Zammuto, 2013). For instance, the Norwegian government changing their regulations regarding their EV policy making the future EV market uncertain. According to Acemoglu and Robinson (2012) there are two kinds of economic and political institutions that generate different levels of instability in the environment. The first one is the extractive institutions, where a small group of individuals concentrate power and opportunities and do their best effort to exploit the rest of the population. The second one is the inclusive institutions, where the rule of the law applies and where many people take part in the governing process and the exploitation level decreases. Acemoglu and Robinson (2012) argue that in an inclusive institution, such as Norway, the political institution must provide justice, the enforcement of contracts, and education, and not least support innovative actions by firm, economic success and growth. The oil drilling in the Arctic, and the Norwegian government when they changed regulations in their EV policy providing attractive incentives in order to stimulate innovation and further development in the EV technology industry are some examples on this in Norway. Extractive institutions can also provide growth, but only temporarily. MNEs that fulfils relevant conditions which is required to influence the environment, might not act as passive players seeking for legitimacy in their relations with new government and regulations, even in developed economies (Riaz, 2009). Instead, they will most likely implement actions which will either cause failure of regulative change efforts or result in co-evolution. Thus, García-Cabrera and Durán-Herrera (2016) argues that a more integrated

model is needed to understand how external and internal institutions act and evolve.

The work of García-Cabrera and Durán-Herrera (2016) identifies and examines these elements with respect to every stage of the co-evolutionary process. Their framework is based on the previous work and models of Cantwell et al. (2010) and Child et al. (2012), but they also include other variables, such as the expulsive and inclusive nature of institutions that involve the political and economic conditions of countries. They contribute to the IB literature by proposing a dynamic model for the co-evolutionary approach that demonstrates the interaction between the MNE and the institutional environment it operates in. This interaction must be understood as a co-evolutionary process where MNEs (institutional entrepreneurs) has an impact on institutional change (affect the environment) but that the institutions also has an impact on the MNEs. Their work (García-Cabrera & Durán-Herrera, 2016) finds that MNEs might use three forms of engagement in institutional changes in the host country to solve controversies with the institutional environment. They suggest that if institutional adaption or avoidance are not successful forms of solving the given conflict, the MNE will resort to institutional co-evolution. The study identifies a playing field where actors compete to achieve their interests and goals, which correspond to what Fligstein (1996) called a "strategic action field" (García-Cabrera & Durán-Herrera, 2016).

Suggested by the current literature on IB is that we need to understand the co-evolutionary process better in order to identify new and useful, practical suggestions in the field of public policy (Duarte & Rodrigues, 2017). The national institutional framework can for example be considered as a relevant location factor that affects the attractiveness of a given country (Dunning & Lundan, 2008; Soskice, 1997). The study of García-Cabrera and Durán-Herrera (2016) generates new insights on institutional and co-evolution political perspectives by clarifying how the interaction between government and industry over time can affect industry outcomes and explain government policy effectiveness, or the causal mechanism that drive co-evolution in an emerging economy.

4. Methodology

4.1 Research setting

The researcher has chosen the case of the Norwegian EV market. The Norwegian EV market had its breakthrough in 2010. Since then the rapid growth in the market, along with the rapid change and improvement in advanced technology and production, contributed to make Norway one of the biggest countries in the world when it comes to the number of EVs per capita. The change in Norway's regulations, providing an EV policy with most attractive incentives and conditions for exporters (EV manufacturers), importers (WOS or EV dealers) and the end user (being the Norwegian people), are a lot of the reason for this success. Now in 2018, new regulations will come into force and most likely cause a significant change in the EV market, where the consequences for now are unknown. In this study, the researcher will look at the case of six EV manufacturers that are operating in the Norwegian EV market: Volkswagen, BMW, Tesla, Nissan, Mercedes and Toyota. The researcher chose this research setting for several reasons. Firstly, the setting in itself is quite interesting and it is highly current. Secondly, Norway has a high degree of government regulation and new government regulation can be seen as a disruptive event. Lastly, there are few studies conducted on this topic and most of the co-evolution studies that has been done with this focus has concerned developing/emerging economies and not a developed economy such as Norway.

4.2 Research design

This thesis will be examined through a qualitative longitudinal case study with an inductive approach. The unit of analysis will be the six car manufacturers mentioned in the setting. This is a research strategy that focus more on understanding the dynamics which are present within single settings, rather than predicting them (Eisenhardt, 1989). The researcher is interested in how MNEs (car manufacturers) relate to the uncertainty caused by a change in institutional regulations (Norwegian government regulations) and how institutions can affect MNEs' strategies. Case study method is preferred when "how" and "why" questions are to be answered (Yin, 2003). In order to discuss co-evolution of firms' and institutions' strategies and the outcomes consequential from this interaction, the author will analyse the Norwegian EV market from a historical

perspective. Common characteristics of co-evolutionary studies are their historical and longitudinal approach and most researchers employ an in-depth longitudinal case study method which provides the researcher with rich data and insight (Dieleman & Sachs, 2008; Duarte & Rodrigues, 2017; Jiang et al., 2016; Murmann, 2013; Rodrigues & Child, 2003). Also, a longitudinal perspective might help to understand how disruptive events, such as new government regulation, can result in new rules that govern the market. At last, the inductive approach allows the researcher to generalize based on observations which are found in primary data and secondary data (Bryman & Bell, 2011, p. 573).

4.3 Research case

The study of this thesis focuses on one main case (the Norwegian EV market), and with six smaller cases (six car manufacturers) for the analysis in order to investigate and observe in detail how the interaction between MNEs and institutions might play out over a longer period within its real-world context. The distinctive purpose of using a case study is to provide a better insight that can contribute to the theory building. According to Yin (2003) does single case research tend to use more theoretical sampling principles. The case was chosen because the phenomenon of interest is visible and transparently observable (Eisenhardt, 1989). The case already shows several observations of trends in the EV market and how the Government and politicians have and has had an impact on these trends through their regulations. The case is intended to show causes for rapid changes that results in great uncertainty for the future EV market in Norway.

Also for the car manufacturers relying on the Norwegian market in terms of sales, product line development and further testing of new technology. Norway is one of the leading countries of promoting EVs and who has had an influence so far for other countries wanting to do the same. Norway is an important and significant market for EV manufacturers. First of all, Norway has been an important early market for the car manufacturers, for both Tesla and the other manufacturers. Norway get delegations visiting from all around the world, including all of the major car manufacturers. In fact, Norway is invited to all around the world to talk about EVs and what Norway is doing (Lie, 2016). Secondly, Norway has become a test laboratory for the future green car industry. German and Asian car manufacturers launch their newest EV models in Norway because they know they

will sell a large volume of their cars there. Over 34 % of all EVs that were sold in 2015 and 2016 on the Western European market is sold in Norway, and the EV responsible in Oslo Municipality, Sture Portvik, states that Norway is an incredible important test market (Lie, 2016). EV manufacturers observe how the Norwegian consumers choose and how they react on the different models, and how their car is doing in the competition with other EV brands in the pioneering Norwegian market (Lie, 2016). EVs does also give the international car industry the reason to drive innovation in the Norwegian market. Volkswagen's EV manager, Christian Senger, said under his visit with the Volkswagen-delegation to Norway in June 2016 that Norway is an important country for them, and that it is crucial in order for them to offer the right EVs in such a growing market (Frydenlund, 2017). A possible sub-question that would have been interesting for this thesis would have been: if the Norwegian EV market is big enough to affect the big car manufacturers' strategies.

When it comes to the analysis of the thesis, 6 car manufacturers that are operating in the Norwegian EV market is preferred in order to understand how they relate to the change in Norwegian regulations and the rapid change in the Norwegian EV market. Interviews with following brands are desirable: Volkswagen, Mercedes and BMW which provides both EVs and PHEVs, Tesla and Nissan which provides EVs, and Toyota which until now has only provided non-plug-in hybrids, but recently announced that they will go all in on producing EVs.

4.4 Data collection

The thesis will be based on both primary and secondary data sources. It will be used primary data collected through several interviews, preferably in person or on the phone, with relevant key individuals giving information that can give some valuable insight on the perspective of the institution and the firms operating in the institutional environment. The researcher will not choose the participants randomly, but use a selective approach. Interviews with key individuals from the respective firm itself (e.g., Tesla, which have WOS in Norway) or from partner firms and distributors (such as Møllergruppen, Bilia, Bertel O. Steen) with first-hand knowledge. Reports and press statements from the preferred car manufacturers can also be seen as helpful. Also, an interview with Nikolai Astrup,

a Norwegian politician from the conservative party Høyre, is preferable due to his previous experience as the leader of the Energy- and Environment Committee (2009-2015) and as the leader of the Transport- and Communications Committee (2015-2017). Two Committees that are concerned about the environment and the inland transportation in Norway within the time period that it will be focused on in this thesis regarding the EV policy. The researcher has also thought about an interview with the Secretary General in EV Norway, Christina Bu, who might give some valuable insight from both perspectives.

More secondary data will be collected in order to support the findings and to get a broader understanding of the chosen research area. The researcher is well aware that the thesis will rely deeply on secondary data. Fortunately, the secondary data on the Norwegian EV market is rich and available both in Norwegian and English. There will be used data from a variety of sources in this study of the phenomenon, which will allow the researcher to triangulate the results and hence, improving the validity and reliability (Bryman & Bell, 2011, p. 397; Eisenhardt, 1989). The market data will include, among other things, market history, market reports and a great number of media articles. EV Norway is also providing with a lot of informative documents, press releases, updated news and articles regarding the Norwegian EV market available to everyone on their webpage. Other secondary data sources will include published articles, journal articles, academic and related books, papers, reports, government records and reports, media articles and chronological events list, to mention some. The researcher will also use secondary data that has already been collected by other companies or individuals, e.g., questionnaires or annual reports done by Kantar TNS, NPRA or Motor, in order to get a better understanding of the context of the Norwegian EV market. In order to collect all this data, the researcher will use different websites, newspapers both in paper and online form, the library and use different databases available through BI's portal.

4.5 Further focus and limitations in the thesis

In this thesis, it will only be focus on the EV market in Norway. It will primarily only concern EVs, but also PHEVs due to the increased trend and incentives that the Norwegian government are providing for both types of vehicles. The increased

interest in PHEVs might have consequences for the EV market in the way it might affect the purchase choice of the Norwegian consumers and the car manufacturers strategy choice - EV vs. PHEV. The firms' product range and their strategy will be in the focus. Currently, we can see a changing focus in some of the car manufacturers' product line. BMW is investing more in PHEVs. Volkswagen first focused on EVs, then more on PHEVs and are now investing more in their EV line again. Toyota was for a long time not interested in producing PHEVs nor EVs and stated that non-plug-in hybrids was the future, now they are taking a full turn and will invest in EVs. They are not mentioning if a PHEV version is a possibility for their already existing non-PHEVs. Mercedes focused a lot on PHEVs but are now going to invest a lot in EVs taking up the competition with Tesla. If this is related to the uncertainty and rapid change in the EV market or not is interesting to find out.

5. Thesis progression plan

January **15th** **Week 4** **2nd part**	• Hand in Preliminary report. • Find a suitable date this week to finalize the plan after getting feedback on the Preliminary report from supervisor. • Finding contacts that will be interviewed for the thesis.
February	• Design the interview guide. • Contact possible interviewees to set date for interview.
March	• Conduct interviews.
April	• Transcribe the interviews and analyse the data. • Send additional questions to the contacts that has been interviewed if needed.
May	• Making adjustments to the research question and literature depending on the outcome of the interviews conducted. • Start writing.
June **1st part** **2nd part** **The end**	• Hand in Final thesis draft and get feedback from supervisor. • Make any adjustments after receiving feedback from supervisor. • Hopefully hand in Final thesis.

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