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Who talks about electric mobility and how? A discursive analysis of electric mobility in Munich

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Abstract:

Urban sustainable mobility has become an urgent pursue for contemporary cities all over the world, because of the environmental and socio-spatial externalities caused by the technocratic modernist planning of the previous century. In this context, electric mobility is promoted as the future of mobility, giving hope for a more sustainable future. The scientific research on electric mobility is dominated by technological and economic approaches relevant for the diffusion of electric vehicles, while there is a literature gap regarding interpretation of the reasons and motives of promotion of electric mobility in cities. Therefore, this thesis aspires to contribute to this underrepresented part of the literature by investigating the discursive strategies of the promotion of electric mobility articulated by politicians, city administration and public planners, automotive industry, and other stakeholders through the case study of Munich. The discursive strategies are articulated within three main storylines: electric mobility as: (1) a means to support multimodality, (2) a solution for environmental problems and (3) a green growth intervention. These storylines and the discursive strategies within them were further discussed in relation to the broader discourses the storylines reflect, namely (1) climate change, (2) green growth, (3) smart cities, demonstrating how these broader technocratic discourses have become embedded and institutionalized in the local policy-making arena. In an additional analytical step, a connection of the electric mobility discursive promotion in Munich with the technocratic planning paradigm was established. This was used for further discussion of the contribution of electric mobility to sustainable mobility in Munich, concluding that the degree of contribution will be decided by the direction that the debate between individual motorized mobility and alternative modes of transport will take.

Preface

This master thesis report was written during the 4th semester of the Master Program of Urban Planning and Management at the Department of Development and Planning of Aalborg University, Denmark during the period from 1st of February 2016 to the 2nd of June 2016. The thesis was executed by Eriketti Servou and the supervisor of the thesis was Sven Kesselring.

For referencing the Harvard method is used. “ibid” is used when referring to the reference immediately before.

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1. Introduction

1.1. Problem formulation

The increasing urbanization of the 21st century has led to an unprecedented population growth of cities and it is projected that almost 70% of the world's population will reside in urban areas by 2050 (United Nations, 2014). This rapid growth caused suburbanization in many cities of the world and an impressive increase in the number of private vehicles. This is because suburban areas have been designed for the automobile through the construction of highway infrastructure, letting cities to expand, which implies that people have to travel longer distances using a car (Bannister, 2008).

Although mobility is vital for urban development, national and international economies and extremely beneficial for businesses and individual users (Banister, 2005), the dominant mobility regime characterized by individual motorized automobiles creates environmental and socio-economic externalities that are difficult to mitigate, such as traffic congestion, accidents, noise, waste, air pollution, unequal access to services and so on (Stead et al, 2000). Most notably it accounts for a third of total global energy consumption (IEA, 2013) and nearly a quarter of global carbon emissions (Dora et al., 2011), while 72% of the transport greenhouse gas emissions emerge from road transportation in the E.U (European Union, 2012). The excessive use of private cars causes congestion, time losses, and increased air and noise pollution and emissions through longer vehicle running times. Private vehicles are further occupying a significantly large amount of space in cities, not only through inner-city streets and highways but also through a considerable amount of parking facilities (Manville & Shoup, 2005; McCahill & Garrick, 2012). In this context, the car is not only a technological artifact, but also a cultural and social artifact in the sense that it also has a symbolic function as a status symbol and it reflects a broader socio-technical system that has been perfected to include motorways with petrol stations, parking facilities in inner cities, out-of-town shopping centers as well as much of urban fabric and form, such as urban sprawl (Barth & Jonas, 2011; Hajer, 2015). That is why it is broadly acknowledged nowadays that there is a need for paradigmatic change from car-dependent mobility towards sustainable mobility. Therefore, the shift towards urban sustainable mobility has become a crucial pursue for contemporary cities.

Within the shift towards sustainable mobility, electric mobility is a quite popular mobility concept implemented in cities all over the globe. The starting point of this thesis is the fact that electric mobility is widely promoted as a solution for a sustainable transport development in cities. Electric vehicles (EVs) have long been advertised as the "*green*" answer to the cities' growing transportation problem (Pechar, 2013). They also dominate the public arena, from celebrities driving luxury electric vehicles (just look at Justin Bieber's 18th birthday present) to government subsidies and major infrastructure upgrades

encouraging people to "*go green*" and buy electric cars (ibid). The central idea of electric mobility is the urban electric car, which means that it is promoted to be used for short distances in urban areas bringing about all the environmental benefits its innovative (smart) technology entails (reduction of local air pollution, noise, climate change risks) (Schwedes et al, 2013). From this perspective, it seems that electric mobility is at the core of a policy for urban sustainable mobility.

Recently, however, electric vehicles have come under scrutiny as to whether they really are a more environmentally-friendly option for consumers. While it is true that running an electric vehicle causes no exhaust emissions, there remain some key environmental concerns regarding the energy sources used to charge electric vehicles, as well as the impacts of vehicle production (Pechar, 2013). Furthermore, many critics claim that there are multiple ways to deal with environmental externalities of transport, such as energy taxes, bike lanes, and land-use changes instead of installing a whole new complex and expensive infrastructure for electric vehicles (Lind, 2010; Zehner, 2013).

Even without questioning if the environmental potential of electric mobility is high or not, sustainable mobility requires something more than simply reducing environmental impacts, namely a shift from traditional transport policy paradigm, which has made automobiles the dominant travel mode, to more sustainable transport solutions (such as cycling, walking and public transport) as well as reallocation of space to the public (Bannister, 2008; Isaksson, 2014). In most policy-making arenas, the electric mobility concept draws elements from broader neoliberal discourses, such as green growth and technocratic discourses (smart technologies, smart grids) and reflects a technological innovation which is supposed to solve all transport problems without the need of any other change in mobility culture (Schwedes et al, 2013). Even though technology can help to deal with environmental problems, it can do nothing about transport issues regarding road accidents and casualties, socio-spatial problems and traffic congestion (Kemp et al, 2012; Banister, 1997; Kemp & Van Lente 2011), if it is not a part of a wider mobility policy, which includes a strategy for changing people's mobility behavior (Schwedes et al, 2013).

The majority of the academic research focuses on the technological and economic characteristics of electric vehicles highlighting their energy efficiency and measuring their potential impact on emission reduction or on user acceptance (demand side) and the development of business models and public policies for the diffusion of electric vehicles. Qualitative and critical research on the interests of the involved stakeholders as well as the policy-making process for the promotion and implementation of electric mobility on a local level is underrepresented. Taking as a point of departure the ambiguity about the impacts of electric mobility on sustainable mobility, this thesis will attempt to contribute to the critical assessment of the reasons of the promotion of electric mobility in an urban context through the case study of Munich. This will be conducted by identifying the discursive

strategies that are used by the different stakeholders involved in the process of electric mobility promotion and implementation. Discursive strategies are defined here as words expressed by specific actors through utterances and statements (that potentially include metaphors to strengthen the argumentation), in order to formulate storylines about electric mobility. Storylines are shared by different actors with potentially different interests that are secured by the same means, i.e. policy stories. In this context, storylines summarize and simplify policy stories. Policy stories only make sense in the wider discursive context in which they are mobilized (Wissenlink et al, 2013). This implies that discourses are important because they can do things (Austin, 1962), namely they shape the way policy is conducted and they produce effects as they are articulated (Wissenlink et al, 2013). Therefore, discourse analysis is a good way to understand urban policy and reveal hidden arguments, conflicts and aspects of the implementation process. In this context, the objectives of this thesis are to reveal who talks about electric mobility and how, what broader hegemonic discourses influence their perceived interests and exclude alternative solutions, and further discuss the role of the discursive promotion of electric mobility in sustainable mobility in Munich. Furthermore, this thesis aspires to provide a deeper understanding of electric mobility policy on a local level and contribute to an underrepresented but crucial part of literature on electric mobility.

Against this background, this thesis looks at the storylines, metaphors and discourse coalitions (groups of actors that share the same storyline and (re)produce it through practices) around electric mobility discourse in the German city of Munich. The City of Munich has been trying since 2006, after the release of the Transport Development Plan of Munich, to achieve a shift towards sustainable mobility through the promotion of alternative modes of transport, such as cycling, walking, car-sharing, bike-sharing and public transport. Regarding electric mobility, since 2009, after the publication of the National Electro-mobility Development Plan, the Federal Government has positioned the City of Munich as responsible for creating the conditions of market "roll-out" of electric vehicles through expanding infrastructure to park and load vehicles, research on improving their technology and pilot demonstration programs, while more recently (in 2015) the City of Munich adopted its own package of financial measures for the promotion of electric mobility. In particular, the role of Munich has been framed as *"leading the way for the electric car of the future"* (Gruber, 2013) and wanting "*to become a global success story*" in the field of electric mobility (Ming-in-Munich, 2015) by the media, contributing to Germany's ambition of becoming the key player for electric mobility technologies. That is why Munich is chosen here as a subject for analysis.

1.2. Research questions

For the reasons stated above, this study investigates the discursive promotion of electric mobility in Munich and attempts to answer the following research question:

What discursive strategies are used in the promotion of electric mobility in Munich?

In order to answer the main research question, the report is divided into different sections, which deal with the following sub-questions:

1. What is electric mobility and which issues of electric mobility have been covered by the literature?
2. What is discourse and why is it important to study it in an urban context?
3. What factors influenced the emergence of electric mobility in Munich?
4. What are the storylines, metaphors and discourse coalitions for the promotion of electric mobility in Munich?
5. What broader discourses do the storylines reflect?
6. How does the discursive promotion of electric mobility in Munich contribute to sustainable mobility?

The first two sub-questions are answered in the Theoretical Framework - Chapter 2 (sections 2.2. and 2.3.), the sub-questions 3 and 4 are answered in the Analysis - Chapter 4 (sections 4.1. and 4.2.), and the sub-questions 5 and 6 are answered in the Discussion - Chapter 5 (sections 5.1. and 5.2.).

2. Theoretical framework

This chapter aims to establish a theoretical framework for the investigation of discursive strategies of electric mobility promotion in Munich. First, the concept of sustainable mobility is introduced and the basic principles for sustainable mobility in cities are presented. Second, the available body of literature on electric mobility is presented, defining the concept of electric mobility and its theoretical relations to sustainable mobility, providing a short historical review and presenting the issues that the scientific research have covered so far. A gap in literature regarding critical assessments of the reasons and motives of electric mobility policy-making in cities is identified. Therefore, the thesis takes as a theoretical starting point the argumentative discourse analysis (ADA) in order to develop a critical perspective on the promotion of electric mobility as an optimal solution for transport problems, introducing the concepts of discourse and discursive constructions as crucial theoretical concepts for the understanding of urban policy-making.

2.1. Sustainable mobility

Nowadays, the existing transport regime based on motorized private vehicles and fossil fuels has been proven environmentally and socially unsustainable (Banister, 2011; Kemp et al, 2012). The problems arising from this transport system range from environmental issues (air pollution and resource depletion) to social problems regarding access to mobility, land use and livable cities (Cohen, 2006). This means that transport problems are related to the interconnectedness of technological issues (vehicles and fuels) with issues of infrastructure, political and economic institutions, lifestyles and social practices in contemporary societies (Augenstein, 2014). Given the multitude of problems related to urban transport, broader visions of sustainable mobility emerged in public and academic discourses. Here the focus is not only on specific types of vehicles and transportation infrastructure, but also on the societal context within which people or goods are moving (Schneidewind & Zahrnt, 2013). In particular, sustainable mobility is supposed to provide social and economic welfare in terms of societal access, personal mobility and trade, without damaging the environment, in terms of emissions and pollution as well as resource depletion (Nykvist & Whitmarsh, 2008).

Banister (2008) sees sustainable mobility as a new paradigm shift from traditional transport policy paradigm, which has made automobiles the dominant transport mode, to more sustainable forms of transport. According to this approach, strategies for achieving sustainable mobility should revolve around four basic principles. First, reducing the need to travel and encourage fewer trips is crucial, since the current high volume of transport has been proven problematic (Banister, 2008; Isaksson, 2014). This could be done by substituting travel needs with the help of the internet and ICT. Second, average trip lengths

should be reduced, which depends a lot on infrastructure and land use planning (Banister & Hickman, 2006; Banister, 2008). Third, efficiency of engines and fuels through technological innovations should be increased, in order to mitigate the negative impacts of the volume of transport that cannot be reduced or substituted. Forth, reduction in the use of cars and a modal shift towards public transport, cycling and walking is also necessary where trips cannot be replaced entirely (Banister, 2008; Bongradt et al, 2013).

Nevertheless, all of the aforementioned strategies, except maybe for increasing overall efficiency, are challenging fundamental societal values and embedded mobility behaviors. For instance, reducing the overall volume of travel is in conflict with a globalized economy of growth and a global society characterized by individualization. But even a strategy of increasing efficiency by introducing alternative vehicles or fuels requires severe changes, such as structuring of industries and markets (Berg & Schneidewind, 2013). Therefore, Banister (2008) emphasizes the role of people's involvement in research and policy-making for sustainable mobility, since he suggests that a mobility regime change towards less car use cannot be achieved directly. He argues that we need to start viewing transport as a valued activity, not as a derived demand and prioritize accessibility over the amount of mobility (Banister, 2008; Isaksson, 2014). The goal is to design cities of high quality, where people would not need to have a car, rather than to forbid car use which would be hard to achieve and it would be seen as the opposite to the values of choice and freedom (Banister, 2008;2011).

2.2. Body of literature about electric mobility

2.2.1. What is meant by electric mobility?

Electric mobility is often articulated by policy-makers as a core solution for achieving sustainable mobility in cities. The common understanding of electric mobility is in terms of a short-hand for electrified auto-mobility (Sauter-Servaes, 2011). Consequently, electric mobility could be seen as a concept that captures a multi-facetted network of innovations around the car as a product, the way it is used and embedded in spatial, social and cultural structures (Weider & Rammler, 2011; Schneidewind, 2011). The main technological artifact that characterizes electric mobility is the battery-electric vehicle (BEV) including all road vehicles with at least three wheels, such as private cars, commercial vehicles and busses (Sauter-Servaes, 2011; Weider & Rammler, 2011). What distinguishes BEVs from other competitive types of alternative electric drive technologies (such as hybrids and fuel cells) is that they are different from conventional vehicles in terms of basic characteristics and ways of functioning (such as shorter range, new grid of charging infrastructure, and shift to inter-modality). In particular, fuel cell vehicles (FCV) and hybrid cars, do not challenge the established patterns of the current motorized private transport system embedded in long-established road, parking and refueling infrastructure networks

(Augenstein, 2014). In this sense, hybrid vehicles and FCVs represent an evolution of conventional cars, since they fulfill the same functions in similar ways, whereas BEVs challenges the dominant regime of private motorized mobility.

More recently, the concept of electric mobility has been expanded in contemporary urban policy visions of new forms of integrated mobility and mobility services to include also electric pedelecs or segways, long-established forms of electrified public transport, such as trains and trams, car-sharing programs, charging infrastructures, smart technologies (i.e. smart grids and i-phone applications) as well as a number of non-consumer applications, such as municipal and commercial fleets (Weider & Rammler, 2011). Therefore, electric mobility covers mainly two of the four aforementioned principles of sustainable mobility: increasing engine and fuel efficiency and modal shift through electric car-sharing and public transport. In the case of electric mobility, ICT applications are not used for substitution of trips and infrastructure planning is not used for reducing travel distance. Instead, they are used for the development of framework conditions for concrete mobility patterns evolving around electric vehicles (Augenstein, 2014). In particular, there is a need for developing convenient charging infrastructure, special parking spaces for electric car-sharing systems, integrated internet applications and platforms for information, as well as smart grids for the distribution of electricity (Cohen, 2006; Kemp & Rotmans, 2005; Augenstein, 2014).

2.2.2. Brief history of electric mobility and current developments

In the last decade electric mobility has gained a lot of prominence as a solution for future sustainable mobility. However, in technical terms, the electrification of vehicles is not new rather is as old as the internal combustion engines (ICE). Between the end of the 19th and around the beginning of the 20th century, three drive types were developed simultaneously, i.e. the steam engine, the ICE and the battery electric vehicles (BEV), and all competed for market success (Høyer, 2008). Although the initiation of mass production of gasoline-powered vehicles by Henry Ford in 1913 started to force electric vehicles out of the market by reducing significantly the cost of gasoline vehicles as compared to electric vehicles (Bellis, 2006), they were temporarily revived during the two World wars, because of gasoline shortages (ICEs and fuels were extensively used for military purposes) (Høyer, 2008). Nevertheless, during the economic crisis in the late 1920s electric vehicles almost disappeared (ibid).

The interest in electric vehicles re-emerged in the 1960s and 1970s in the USA due to the increasing public awareness about the negative effects of air pollution and rising oil prices (oil crisis) (Dijk et al, 2012). The 1965 U.S. Clean Air Act triggered several research institutes and firms to develop electric cars, but results were poor regarding both technological performance and price compared to their gasoline counterparts (Mom, 1997 as referenced by Dijk et al, 2012).

After a long period of little activity, interest on electric vehicles revived once again in the early 1990's due to the coincidence of an international economic crisis of the automotive industry and the peak of the environmental debate. The discourse was triggered primarily by the regulatory push by the Californian Zero Emission Vehicle Mandate (Dijk et al, 2012), which forced car manufacturers to develop electric vehicles (Westbrook, 2007) and secondly by the environmental policies and large demonstration programs carried out in Europe (Germany, France and Switzerland) (Dijk et al, 2012; Høyer, 2008). However, the discourse of electric vehicles slowed down gradually and it completely ceased when the Mandate was abolished in 2003 due to lawsuits by the traditional automotive industry, which had overcome its crisis (Collantes, 2006), while competitive types of drive technology such as hydrogen engine (fuel cell) and hybrid electric vehicles gained more prominence (Schwedes et al, 2012).

In the last decade (since 2005) there has been a new attempt to promote electric mobility due to broadening and more integrated perspective on sustainability (Augenstein, 2014), the peak oil issue that pushes for a transition to renewable types of energy, the economic crisis that affected the automotive industry once again and the recent developments in battery technology by the power industry (Schwedes, 2011). Besides that, automotive industry deals with saturated markets mostly in the industrialized countries and they attempt to diversify their strategies (Orsato et al, 2012), since conventional car has started to lose its relevance. For all the aforementioned reasons along with the strong unprecedented momentum by national policy initiatives and industry, some experts think that now the ground is fertile for the successful implementation of electric mobility once and for all. For a more complete overview of the history of electric mobility and the current developments in the field see Bellis (2006), Høyer (2008), Guarneri (2012) and Dijk et al (2012).

2.2.3. Literature on electric mobility

A vast amount of literature on electric mobility discusses the user acceptance and whether electric vehicles are an attractive option for customers (see Garcia & Miguel, 2012 and Axsen et al, 2012). According to Hanke et al (2014), in their literature review about socio-economic aspects of electric mobility, the level of acceptance is mainly affected by safety, range, charging time, price, design and image (see also Sammer et al, 2008; Bingham et al, 2012; Chlond et al, 2012; Franke et al 2012; Lunz et al, 2012; Zhang et al, 2011). Hjorthol (2013) and Mühlbäck & Hendrikx (2015) demonstrate that users' most commonly stated motives for the purchase of electric cars are the special regulatory advantages (e.g. free parking, reduced taxes or financial support), environmental friendliness as a lifestyle, lower operation costs and convenience and fun to drive these vehicles. Regarding the characteristics of users, the typical user is considered to be male, familiar with technology, well-educated with a modern lifestyle and high income (ibid). In terms of mobility patterns,

Raykin et al (2012) find that electric vehicles can be available for short distance due to the limited range of batteries, thus will be used as a second car in cities. Therefore, limited range together with high price and charging time are the main obstacles for the broader user acceptance (Hawkins et al, 2012). Canzler and Knie (2010) and Wapperlhorst et al (2016) claim that for the increase of user acceptance, the development of integral mobility systems is required to offer alternatives of long-distance travel, such as combination of electric vehicles with the use of public transport and car-sharing. Overall, the user acceptance can be evaluated as positive regarding new technologies and business models (Hanke et al, 2014), but the users must gain experience with the electric vehicles so that perceived drawbacks of electric vehicles like price or range can be balanced by some positive experiences of everyday usability (Zimmer and Rammler, 2011).

The relation between electric mobility and environmental sustainability is addressed in a diversity of papers. For instance, Bartolozzi et al (2012) and Faria et al (2012) conduct life-cycle analyses to assess the environmental impact of electric vehicles depending on different energy sources, while Stamp et al. (2012) assess the impact of different supply options for lithium carbonate and how this affects the general balance of electric vehicles. Although it is broadly discussed that the wider adoption of electric vehicles could result in significant reductions of carbon emissions and energy consumption, this can hardly be estimated, because there is only a few data based on empirical cases and experiments (Hanke et al, 2014). In particular, evidence show that electric vehicles can only be as green as the electricity used to charge their batteries, which means that there might be direct carbon emission reduction from transport at the local level, but if the energy used for charging is not renewable (e.g. fossil fuels), the wider ecological impact is very debatable (Mackay, 2009; RAE, 2010). In the case the energy produced for charging is dirty (coming from coal, oil or nuclear plants), there will be only a little cut in emissions, while the same improvement can be achieved by improving the efficiency of gasoline engines (Orski, 1998; Van Deventer et al, 2011). There is also evidence that the charging infrastructure of electric vehicles is more carbon and energy intensive than of diesel and petrol vehicles (Lucas et al, 2012). Another issue is that if batteries and other components of electric vehicles are not recycled, then they will cause new and massive environmental problems, shifting the environmental problem from emission to storage (Van Deventer et al, 2011). In short, the findings about the overall environmental benefits of electric mobility are still unclear. Furthermore, the benefits of electric mobility on health mostly refer to significantly lower noise levels and fine dust, but there are concerns that the absence of engine noise poses a safety hazard to pedestrians, especially to the visually impaired (Thomas, 2010; ANEC, 2010).

Van Deventer et al (2011), express concerns about the socio-economic impacts of electric vehicles in terms of creative destruction. In particular, in areas with great dependency on

traditional automotive industry, the introduction of electric vehicles might cause unemployment. Furthermore, there are concerns about the accessibility of electric vehicles for ordinary customers and not only for affluent people, since electric vehicles are relatively expensive.

Regarding the impacts of electric mobility on urban transport, a commonly stated advantage lies in the possibility of reviewing and possible redesigning of existing mobility structures, including transport infrastructure, through different modes in passenger transport and freight (Canzler, 2010; Canzler & Knie, 2010). Specifically, several scholars highlight the beneficial synergies between electric mobility and car-sharing. For instance, Fournier et al (2015) claim that combining car-sharing and electric mobility results in a "*circulus virtuosis*", in other words a profitable dynamic, because they are mutually beneficial. Wappelhorst et al (2016) state that car-sharing with electric vehicles is a promising solution to balance the disadvantages of electric vehicles: high costs and lack of range. In particular, the total costs of ownership can be spread among many users, while as a part of the public transport system electric car-sharing can offer a complement for local and long-distance travel and decrease car traffic (ibid). However, promoting electric vehicles alone, without being a part of a holistic scheme of mobility, does not solve traffic problems (Taylor, 2015). Furthermore, there is the risk of electric vehicles increasing at the expense of public transport. As Hanke et al (2014) claim, it is still open how and to which extent the use of electric cars really substitute other motorized individual mobility or whether it rather leads to additional traffic.

A part of literature discusses the correlation between electric vehicles and smart grids. A smart grid is an electricity network that not only supplies energy to consumers (using automated charge controls) but also allows consumers to give back to the grid, blurring the boundaries between energy producers and consumers (Van Deventer et al, 2011). Falvo et al (2011) study electric mobility within a broader perspective of urban infrastructures, linking metro transit systems and electric vehicles via smart grids. This case suggests the integration of public and private transport as well as the energy system within the urban mobility system.

Another strand of literature deals with the different approaches (monetary and non-monetary) for the development and promotion of electric vehicles by policy makers. Hanke et al (2014) claim that there is a lot of controversy whether and how financial support of electric vehicles should take place (see also Arnold et al, 2010; Dudenhöffer et al, 2012; Indra, 2012; Krutilla & Graham, 2012; Schill, 2010; Yang, 2010). According to Hanke et al (2014), the financial assistance can take different forms in different countries. Direct incentives include purchase subsidies to consumers or car manufacturers. Indirect incentives include waivers of sales taxes, reduction of the motor vehicle tax, low-interest loans or improved possibilities of tax depreciation. Other forms of indirect incentives focus

on measures that affect the willingness of consumers to buy electric vehicles, such as provision of information through everyday media (television or online portals), test drivers or exhibition performances that help consumers to get their own driving experience of electric vehicles, subsidy to research and development and funding of charging infrastructure development (Tsang et al, 2012; Hanke et al, 2014). The public sector can also affect market demand by public procurements and equipping public car fleets with electric vehicles (such as busses for public transport or vehicles for waste management) (Rudolph 2012). Regarding non-monetary incentives of electric vehicles promotion, the joint use of bus or taxi lanes or parking facilities with charging infrastructure, toll exemption, driving in green zones, access in pedestrian zones with electric delivery vehicles at night and a marker for the distinction of electric vehicles have reported as important measures for the increase of electric vehicles sales (Sammer, 2012; Clausen & Schaumann, 2012; Hanke et al, 2014). These policies and incentives can take place on different government levels (national, regional, local) depending on the degree of policy centralization of each country (Van der Steen et al, 2015). Tsang et al (2012) provide a review on policies and incentives for the wider adoption of electric vehicles in selected countries and cities. Hanke et al (2014) claims that it is still unclear if the monetary incentives are efficient enough, while it has to be investigated further how government objectives can be achieved and whether they result in ecological and macroeconomic benefits.

Although there are several reports and research papers with policy recommendations and guidelines for the successful promotion and implementation of electric mobility (see Van Deventer, 2011; Tsang et al, 2012; Comodi et al, 2016; Fornahl & Hülsmann, 2016), studies about the analysis of the policy-making and implementation process of electric mobility and the motives of different actors are scarce. Tsang et al (2012) and Van Deventer et al (2011) mention that the main motivations on a national level are environmental concerns (climate change and transition to renewable energy) and economic concerns (reviving automotive industries through job creation, boosting the renewable energy sector, creating innovation clusters in the context of international competitiveness and reducing dependency on foreign oil). Bakker et al (2014) identify six potential conflicts of interest between stakeholders regarding the development and commercialization of electric vehicles and their recharging infrastructure in the Netherlands: the division of tasks within a public recharging infrastructure, the allocation of charging spots, the ways in which charging behavior can be influenced, the role of fast-charging, technical standards for charging equipment and supportive policies. The paper of Schwedes et al (2012) "*E-mobility in Germany: White hope for a sustainable development or fig leaf for particular interests*" is the only one critical discourse analysis about electric mobility found in the literature aiming at a critical interpretation of the policy making process. In particular, they analyze the development of electric mobility discourse in Germany, focusing on the

interests of the actors involved and the driving forces of the electric mobility discourse, while attempting to answer whether it is promoted in a sustainable way.

A significant part of literature about electric mobility deals with electric mobility within the field of transition research. Augenstein (2014), in her dissertation "*E-Mobility as a Sustainable System Innovation: Insights from a Captured Niche*", provides an excellent literature review of research papers on "*e-mobility as a sustainable system innovation*". The majority of this literature focuses on the dynamics of market, business strategies or suitable policy instruments and regards electric vehicles as a technological substitute of the conventional cars without assessing the potential of electric mobility towards a more fundamental social system innovation (see Weber & Hoogma, 1998; Åhman, 2006; Hasegawa 2010; Kühne, 2010; Magnusson & Berggren, 2011; Sierzchula et al. 2012; Bakker et al, 2012). Only few papers within the field of sustainability transition research adopt a broader scope on socio-technical evolution looking beyond market-based and technological developments. For instance, Dijk et al (2013) see the "*emergence of an electric mobility trajectory*" as the result of interlinked technological and social dynamics, identifying as critical factors for the development of electric mobility: developments in infrastructure, mobility, in the global car market, energy prices, and the electricity sector and climate policy. In the same vein, Van Bree et al (2010) discuss how the relationship between car manufacturers and consumers is influenced by socio-technical co-evolution in the field of hydrogen vehicles and electric mobility.

Overall, as Augenstein (2014) concludes in her review, research on electric mobility is dominated by technological and economic approaches relevant for the diffusion of electric vehicles. However, there is a lack of a broader perspective on sustainable mobility, regarding the degree to which electrified types of mobility are potentially more sustainable, not only in terms of emissions and resource depletion but also social aspects. This is probably because of the fact that electric vehicle as a technological innovation is at the core of public agendas and discourses in the context of economic potential for national industries (ibid). Furthermore, the findings about the impacts on environment, transport, health and society of electric mobility are still unclear. Last but foremost, critical interpretations of electric mobility promotion and implementation processes are underrepresented with only few studies concerning the national level, while there is no actual study on a local level.

2.3. Argumentative Discourse Analysis

2.3.1. The Argumentative Turn

The argumentative turn, which was introduced by Frank Fischer and John Forester in 1993, refers to a series of approaches which emphasize the relevance of language, argumentation and deliberation in policy-making and analysis and in planning theory and practice (Fischer & Forester, 1993). The argumentative turn was inspired by the linguistic turn in the humanities and addresses the epistemological limitations of neo-positivist policy-analysis and policy-making and an instrumentalist and techno-scientific approach to planning theory and practice (ibid). To elaborate, rather than operating with one scientific truth, approaches within the argumentative turn put emphasis on the existence of a diversity of interpretations, meanings, beliefs and realities. Therefore, planning practice is not seen as value-free and apolitical, but rather it reflects and reproduces larger societal norms (ibid.). The axiom is that by understanding the way stories are created, arguments are developed and the way discourse influences decision-making, critical thinking is enhanced and the arguments of others can be revealed. Three analytical frameworks: story-telling, building arguments and discourse provide means to 'mediate' between the individual (actors) and the structures (institutions) (ibid). Hence, the argumentative turn allows for more plurality in analysis and practice rather than drawing up a sharp dichotomy between structure and agency.

2.3.2. Defining discourse: Why is the study of discourses important in an urban context?

Discourse theory is a field within the argumentative turn in policy analysis and planning and constitutes a form of social constructivism (Hajer & Versteeg, 2005) in the sense that it provides the tools with which problems are constructed and forms the context in which phenomena are understood and thus predetermines the definition of a problem (Hajer, 1993). In other words, it provides the conceptual framework for the interpretation of facts, events, actions and phenomena. Maarten Hajer is one of the main contributors to the study of discourses within policy and planning and defines discourse as:

> "*an ensemble of notions ideas, concepts and categorizations through which meaning is allocated to social and physical phenomena and which is produced and reproduced in an identifiable set of practices*" (Hajer & Versteeg, 2005; Hajer, 2009).

Discourse is structures embedded in language (Hajer, 2006; Dryzek, 2005) and its focus is on the preconditions for action and not on the action itself (Løkke, 2006). For instance, the fact that electric mobility is promoted as a mainstream solution for sustainable urban mobility in Munich is an action, but the driving forces and circumstances that led to its promotion and the reasons why it is perceived and articulated as an optimal solution are

related to the structuring of a site-specific discourse of electric mobility. Furthermore, a discourse does not only refer to language, but also to practices. This is illustrated by the following quote, which bears resemblance to Hajer's definition, by Richardson, who defines discourse as:

> "*multiple and competing sets of ideas and concepts which are produced, reproduced and transformed in everyday practices, and through which the material and social world is given meaning*" (Richardson, 2002).

In an urban setting, discourse analysis is a methodology to understand urban policy implementation processes (Jacobs, 2006). According to Hajer (2015), urbanization is the outcome of a process of "*discourse formation*", in which coalitions are shaped, that will effectively push a particular agenda. Therefore, it is important to study discourses surrounding urban policies, in order to interpret why specific policies are considered and chosen as the best options for implementation. Discourse analysis is based on the assumption that language is not neutral medium but instead shapes how reality is viewed and partly the interpretation of interests (Hajer, 2006; Løkke, 2006). A linguistic understanding of urban policy denies interests as the basis of actions; rather it claims that interests are inter-subjectively constituted through discourse (Løkke, 2006). A study of language can provide important insights about the deliberation of policy implementation and the ways language is used to pursue political and organizational objectives, which is not always evident from traditional policy research focusing only on the role of bureaucratic modes of organization and implementation practices (Jacobs, 2006). As Fischler (2000) claims, "*we ought to place greater emphasis on what shapes the mental and social universe of speakers rather than on their specific statements*". Discourse analysis can also reveal if the debate about a specific topic is deliberative, inclusive, open, accountable and reciprocal (Hajer & Versteeg, 2005). This may not be the case, as discourse may be used for exclusion through truth-claims (Richardson, 2002). As Schattschneider (1960) imparts, through language some issues are taking into account in policy while others are left out.

2.3.3. Discursive Constructions

Hajer (2006) defines argumentative discourse analysis as "*the examination of argumentative structure in documents or other written and spoken statements as well as the practices through which these utterances are made*". In planning, a definition of a problem or the meaning assigned to a particular policy is considered as constantly changing (ibid). Subsequently, questions of how to delineate a discourse and what detail of analysis is needed are raised. There have been developed different approaches to how to identify a discourse. While Foucault supports studies of very long time horizons, others argue for extremely detailed analyses and narrowed down research questions. However, Hajer

(2006) claims that the opposition between detail and relevance is a false one and that the degree of detail is a matter of research design.

Following "The Argumentative Turn in Policy Analysis and Planning" by Fischer & Forester (1993), this thesis' objective is an argumentative discourse analysis about electric mobility in Munich focusing on the current discursive strategies used by key actors for the promotion of electric mobility. This master thesis takes as a starting point a Foucauldian conception of discourse and an operationalization of this discourse conception into a methodology for argumentative discourse analysis by Hajer. Foucault's work examines the diversity of meanings individuals and groups attach to similar and common experiences, thereafter how knowledge is plural and historically created through discourse. In other words, it examines how discourses are related to wider social processes on larger scales and sees "*discourses as historically specific frameworks of thought and action*" (Fischler, 2000). Hajer, who operationalized Foucault's intellectual approach to discourse, focuses on the significance of social practices or the settings, which regulate the actions of actors, for the formation of discourses. Therefore, Hajer's approach draws attention to how discourses are shaped (Hewitt, 2009). Hajer suggests the use of three tools to identify discourses within research material: metaphors, storylines, discourse coalitions (Hajer, 2006; Hewitt, 2009). The meaning of these discursive constructions and their interrelations are analyzed in the following.

1) Metaphors

Metaphors are generally two or three key word phrases which symbolize the key ideas of a discourse (Hewitt, 2009). Metaphors can function as emblems that reduce the complexity of problems and provide a general understanding, facilitating a change in policy as well as bringing about conceptual shifts (Hajer, 2006). Therefore, spotting metaphors is important for understanding policy discourse, as they play a key role in the process through which a discourse becomes dominant in policy-making. For example, electric mobility is often referred to as "*the future of mobility*". This metaphor can be indicative of how the promotion of electric mobility became a hegemonic strategy for urban mobility in policy-making arenas.

2) Storylines

When a new discourse is formulated, it will produce storylines on specific problems, employing the conceptual machinery of the new discourse (Hajer, 1993). Storylines encapsulate the essence of a discourse in a short-hand form using the metaphors (Hewitt, 2009). This means that a storyline is a statement which reduces the complexity of complex narratives (Hajer, 2006). In other words, different people often have different variations of a particular story, but a storyline can provide a consensus and is functional in gathering a diversity of actors (discourse coalition) around it. In urban policy, a storyline represents

the way actors contextualize and perceive what a good city is and reflects broader discourses (Hajer, 2015). Storylines can potentially change the actors' perception of own interests, thus a storyline helps to examine how perceived interests are created (Løkke, 2006). Therefore, storylines are a means of imposing views and perceptions of reality coming from broader discourses, thus further helps us understand how actors grasp a specific problem (Hajer, 1993).

3) Discourse coalition

Hajer (1993) defines a discourse coalition as "*the ensemble of a set of storylines, the actors that utter these story lines and the practices that conform to these story lines, all organized around a discourse*". What typically happens in a discourse formation is the emergence of coalitions of actors that have similar interests and appropriate and articulate a set of storylines to create the persuasive power to bring about change, while shaping their practices according to the discourses surrounding those storylines, thus reproducing and transforming discourses through these practices (Hajer, 2015). Storylines of public policy are not limited to any one organization or government department, but are shared by the national and local players involved and by the academic community, the media and other actors (Hewitt, 2009). In urban policy, the actors operating in a coalition do not necessarily agree on all the details, but they agree on a strategic orientation and share a common language to discuss cities (Hajer, 2015). For any discourse to succeed in shifting the goals of policy it must gather around it a discourse coalition of actors with a strong interest in its success (Hajer, 1995).

Policy change takes place when a discourse coalition becomes dominant. According to Hajer (1993; 2015), there are two conditions of discourse coalition dominance:

- Condition of discourse structuration: It takes place when a discourse dominates the discursive space and describes the process in which a particular way of conceiving reality establishes to become a new normal generally accepted way of talking and seeing.
- Condition of discourse institutionalization: After the structuration of a discourse, it starts to institutionalize in new rules and routines, planning processes, laws, new business models, new roles for state agencies and market, citizens and experts and even newly shared values. In other words, it is reflected in the institutional practices of a policy domain.

3. Methodology

This chapter presents the scientific approach to address the problem introduced by the research question. Firstly, the case study approach is presented and its selection is justified. This is followed by a presentation of the methodological framework about the discursive analysis of electric mobility in Munich, where the reasons of the selection of ADA approach is explained. The methodological framework is divided into two sections: data collection and data analysis. The research design of the thesis is shown in the following figure.

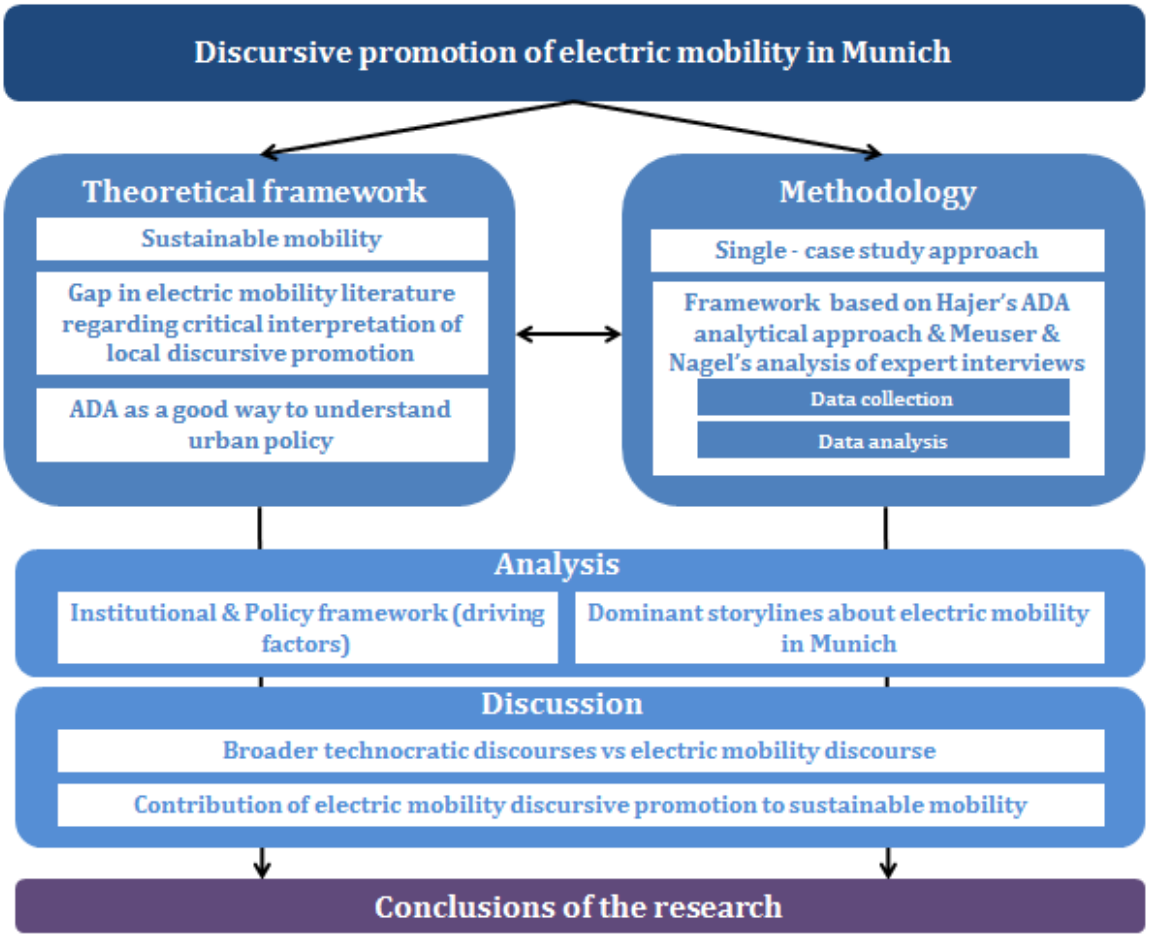

Figure 1: Research design (own illustration)

3.1. The case study approach

As stated in the introduction, the main purpose of this thesis is to investigate how the main actors of electric mobility promotion perceive electric mobility through the discursive strategies they use and how the discursive promotion of electric mobility contributes to sustainable mobility. In this context, the case study approach was chosen primarily because focusing on one specific case in detail enables a comprehensive analysis of a particular

issue. Flyvbjerg (2006: 221, 229) and Yin (2014: 4, 51) acknowledge that a single-case study or a critical case study enables the production of the type of context dependent-knowledge based on real-life practices and explore deeper issues behind a given process or phenomenon, in contrast to the superficial analysis that can be brought about by looking at various cases. One of the main reasons that make electric mobility promotion in Munich a critical case is that Munich is the only city in Germany that decided to develop its own financial policy for the promotion of electric mobility, since in most cases electric mobility policy comes from higher levels of administration (governmental or regional). At the same time, Munich, being both home of one of the most powerful automobile industries (BMW) worldwide and a congested European city that is attempting a transition to more sustainable modes of transport, is aspiring to become a leading force in electric mobility globally. Therefore, it provides interesting insights into the interplay and synergies regarding electric mobility policy-making between traditional automobile industry and public authorities that promote the image of Munich as a sustainable city.

The generalizability of a particular case is also an important issue. Flyvbjerg (2006: 228) claims that "*…formal generalization is overvalued as a source of scientific development, whereas the force of example is underestimated*". This means that a context-dependent case study will provide knowledge as important as the aim to generalize. Given this, it is hoped that the chosen case study will be able to generate knowledge that is useful when attempting to identify the discursive strategies of electric mobility used by actors in other local policy-making arenas. However, it must be mentioned that there are some limitations regarding the deployment of the findings of the case study of Munich in other urban contexts, since there are some non-generic local and national factors that influence the policy-making, such as mobility culture and political mentality. For this reason, the findings of the case of study of electric mobility promotion in Munich might present a greater generalizability in German urban contexts.

3.2. A methodology of the argumentative discourse analysis of electric mobility in Munich

As mentioned before, this thesis adopts the argumentative discourse analysis (ADA), which has been operationalized by Hajer. The objective of ADA is to investigate "*what is said to whom, and in what context*" (Hajer & Versteeg, 2005). In this context, ADA serves the purpose of revealing the ideas and concepts in terms of which electric mobility in Munich is discussed as well as the practices through which electric mobility discourse is (re)produced.

The main reason why Hajer's ADA and not another discursive approach, such as Critical Discourse Analysis (CDA) or Discursive Institutionalism (DI), was selected as an analytical approach is that Hajer offers a clear methodological framework for discourse analysis, while there is no actual operationalization of other approaches, which makes the

methodological framework of discourse analysis pretty vague. Furthermore, although the main purpose of the thesis is to examine what factors and broader discourses shape the discourse of electric mobility in Munich, which implies a focus on how structure affects agency, the agency of the actors and the interaction among them is also taken into account, since how the discursive promotion of electric mobility contributes to sustainable mobility is also discussed (which essentially means to what extent actors (re)shape electric mobility discourse despite the dominance of broader neo-liberal and technocratic discourses). In this context, most of the discursive approaches focus on texts as the main source of empirical data, which neglects the reproduction of discourses between actors. On the other hand, Hajer's approach explores the agency of actors through the concept of practices suggesting the use of recordings of interactions (audio or video) and expert interviews, which better capture the essence of agency. This serves the operationalization of this thesis for one more reason: most of the official documents and online articles about the topic were in German, which made it difficult for the author to rely the data collection primarily on textual material due to lack of proficiency in German language. For all the above reasons, Hajer's ADA was chosen as an inspiration for the methodology of this thesis.

In fact, Hajer developed 10 concrete steps as an analytical approach to ADA. However, according to Hewitt (2009: 3), truth is something that is constructed within a discourse and is "*relational to the knowledge and practices of this discourse*", which means that the "*relational nature of truth means that methodological choices made in any research project are driven by the problem at the center of the research*". This implies that it is not possible to make a concrete framework for discourse analysis that fits in any research design. Therefore, this thesis was inspired by Hajer's methodological approach to ADA without faithfully adopting all the steps one by one. The following section presents the methodological framework developed for this thesis divided into two stages: data collection and data analysis.

3.2.1. Data collection

The data collection stage is comprised of four steps, which are in line with Hajer's 4 first steps of ADA: 1) desk research, 2) helicopter interviews 3) interviews with key players and 4) key documents. The interviews were conducted in the period from the 24th of March 2016 until the 2nd of May 2016. The development of the interview guides and the process of interviewing were inspired by several publications on qualitative research using expert interviews, such as Leech (2002) and Meuser and Nagel (2009). At this point, it has to be mentioned that to ensure openness during the interviews, anonymity has been suggested to the respondents. Therefore, their names are withheld in this thesis. All interview transcripts and audios can be found in the appendices (A, B, and C) for helicopter interviews and (D, E, F, G, and H) for interviews with key players on the attached CD. The institutions of the interview partners are listed in the appendix 8.1. at the end of the report.

Desk research

The initial review of local newspaper articles, mainly from online newspapers, such as *Süddeutsche Zeitung* and *The Munich Eye,* and national portals, such as *Emobilitätonline*, on the topic of electric mobility in Munich, as well as a review of the official webpages of the City of Munich provided an initial understanding about the chronology of events and a first identification of the key actors, positions and argumentations. At this point, it has to be mentioned that most of these local online sources provided data in German, which were translated in English by the author. Furthermore, a review in international online newspapers was conducted, such as *The Guardian,* and international portals about urban sustainability, such as *Next City* and *Sense and Sustainability* gave a picture about the topic of electric mobility in Munich in comparison with other cities worldwide.

Helicopter interviews

In order to get a better understanding of the topic and fill in knowledge gaps due to the language barrier of the desk research, three qualitative semi-structured interviews were conducted. The interviewees include a project manager who is responsible for the coordination of federal and regional electric mobility projects with the local level, an academic who conducts research about improving electric mobility technologies (storage, engine efficiency etc.) and a well-informed local journalist who has written articles about the political interplay of electric mobility in Munich. These interviewees provided an overview about the factors that led to the uptake of electric mobility in Munich (both external and internal). They also provided a picture about electric mobility history and development, the policy initiatives and projects in the early stages of the electric mobility promotion in Munich as well as the general perception regarding electric mobility amongst politicians, public officers and private sector. For these semi-structured talk-like interviews an interview guide was used, which is the same with the general interview guide used in the interviews with key-players (appendix 8.2.1 at the end of the report), with the difference that it functioned as a checklist to cover relevant topics and was not followed strictly, as the goal was to get the overview of the topic. However, in some moments during the interviews, the interviewees went deeper into topics and provided important information.

Interviews with key players

In order to obtain more focused knowledge about the topic, interviews with key players were conducted (Hajer, 2006). Here four groups of key players were identified: political parties, the Departments of the City of Munich (public planners and administrative officials), the City Energy Provider SWM together with the Transport Company of Munich MVG (MVG belongs to SWM) and the automobile industry (mainly represented by BMW). Therefore, five expert interviews were made with two transport planners from the Departments of the City of Munich, one politician, one project manager from SWM-MVG

and one representative of BMW Group responsible for steering the policy for electric mobility of BMW in Munich.

The aim was to get at least one interview partner from every actors' group, in order to gain knowledge about the causal chain of events, employment of storylines and metaphors as well as further uncover the site-specific discourse of electric mobility and the practices that reproduce it (Hajer, 2006). Most importantly, the interviews helped in understanding how different actors perceive and interpret certain events and practices in different ways (such as the appropriateness of electric mobility to reducing emissions in Munich), while sharing the same storylines. Therefore, the information derived from theses interviews consist the core part of collected data and is the main source of first-hand knowledge for the analysis of the discursive strategies of different actors.

As mentioned before, there was a general interview guide for all the interview partners (both helicopter interviewees and key players). However, there was an additional more specific interview guide for the key players. The interview guides can be found in the appendices 8.2.1 and 8.2.2 at the end of the report. As in the case of the helicopter interviews, the type of semi-structured interview was chosen as an interviewing method, primarily because this type of interview stimulates the fluidity of a conversation and does not restrict what one can or cannot say (Yin, 2014). Therefore, during the interviews, questions previously not included in the interview guides were sometimes asked, as new topics were brought up by the interviewees.

Key documents

A fourth stage of the data collection process included the collection of case relevant official documents, such as the Municipal Sustainable Electric Mobility Concept and the Munich Electro-mobility Initiative (IHEFM). The document gathering was conducted through an online research on the relevant websites of the departments of the City of Munich and the City Council. These documents were not analyzed using a specific methodology, but were used to inform the analysis and research process and back-up the information derived from the expert interviews. Here again the vast majority of local official documents were written in German, and a translation in English was necessary. Apart from the local official documents, documents on an international and national level, such as AGENDA 21, Germany's Integrated Energy and Climate Program (IEKP), and National Development Plan for Electric Mobility were collected in order to identify the institutionalization of broader discourses in the local level that affect the structuration of the electric mobility discourse in Munich.

3.2.2. Data analysis

After collecting the research material mentioned in the previous section, the data analysis process took place. Since the main source of information was based on the expert

interviews, a methodological framework for the analysis of the interviews had to be formulated. For this reason, the analysis of the interviews was based on the analysis of expert interviews described by Meuser and Nagel (2009). First, the recorded interviews were transcribed and some small parts of text were paraphrased for cohesion reasons. Next, an initial coding scheme was developed by structuring the interviews' content according to topics, themes, categories and theoretical considerations. This coding includes a thematic comparison between the interviews, which means that thematically comparable passages from different interviews were tied together, but still remained close to the interview's direct written content (Meuser and Nagel, 2009). Furthermore, the coding included direct quotes, exemplifying the codes and topics. The codified data were used as first drafts within the write-up process for both the analysis and discussion.

The thematic comparison and categorization was also inspired by a combination of Hajer's (2006) next four steps of ADA, namely sites of argumentation, identification of key incidents, analysis of practices in particular cases of argumentation and interpretation, while the steps of analysis of positioning effects and second visit to key actors were omitted. The analysis of positioning effects is out of the scope of this thesis, as the focus is not on who exercises power to whom, while there was no second visit to key actors, because of time limitations. In particular, the research material coming from the expert interviews (and backed-up by online articles and official documents) was organized around the key incidents during the policy-making process of electric mobility, the sites of argumentation between the different actors and the practices in particular cases of argumentation. At this point, it has to be mentioned that there was no intense debate about the topic of electric mobility in Munich. Therefore, the sites of argumentation were not about being against the idea of electric mobility, but mostly about how it is promoted and what purpose it serves. The interpretation of the discourse analysis took place in the discussion, where the broader discourses that are reflected through the storylines of the site-specific discourse of electric mobility in Munich were discussed and how the discursive promotion of electric mobility in Munich contributes to sustainable mobility.

4. Analysis

This chapter presents the analysis of the institutional and policy framework that led to the uptake of electric mobility in Munich and the storylines surrounding the electric mobility discourse. The former represents the internal and external factors that influenced the development of electric mobility in Munich and is comprised of the institutional and legislative framework coming from the federal government, the initial promotional initiatives of electric mobility in Munich (2009-2012) and how they have been influenced by the federal policy, and the current promotional activities (since 2012) and the political-administrative landscape in Munich. This section has been informed by a document analysis of national and local policy documents, a review of online articles and academic literature regarding the uptake of electric mobility in Germany and Munich, and to a certain extent by the expert interviews (especially the helicopter interviews). The latter is mainly based on the analysis of expert interviews.

4.1. The institutional and policy framework of electric mobility promotion in Munich

4.1.1. The uptake of electric mobility in the federal level

The electric mobility concept emerged in Germany in the early 1990's for the first time, when a global automobile crisis appeared together with the prevalence of the environmental debate about ecological modernization (Schwedes et al, 2013). At that moment, electric mobility was seen by the Federal Government as a possible means to align environmental concerns with economic development through the electrification of the private car and was described almost entirely in terms of the private car (Tschoerner, 2015). The topic lost relevance in the later 1990s, when the automobile industry overcame its crisis and improved its technology. The traditional automobile industry managed to dominate against power industry by raising concerns about the low efficiency of batteries for the electric car as well as the low environmental benefits of vehicles. The government decided to stop the funding for the development of electric mobility, following the most dominant actor (automobile industry), as it constituted an important sector of the German economy (Schwedes et al, 2013).

The more recent debate on electric mobility in Germany began around 2007, when the financial and economic crisis influenced the automobile sector again. Furthermore, environmental concerns about climate change together with the peak oil became "hot" issues. Although the automobile industry managed to overcome the crisis again and counter-arguments about the negative impact of conventional cars on climate change were raised (i.e. the car is not the main source of carbon dioxide emissions), the issue of the peak oil remained very serious. At the same time, power industry started investing in charging

infrastructure discovering new sales potentials for its electricity develops, and battery suppliers develop more efficient environmental friendly technologies for electric cars, putting more pressure on the automobile industry (Schwedes, et al, 2013).

All these factors (with the peak oil issue being the main driver) led the Federal Government to pass the National Development Plan for Electric Mobility (along with Economic Stimulus Package as a catalyst for the crisis) in 2009 and resume funding for electric mobility (Federal Government of Germany, 2009; Schwedes et al, 2013). The plan connected

- the promotion of electric mobility with the Federal Government's policy of energy transition (among others the promotion of renewable sources of energy and phasing out the use of fossil fuels) (Tschoerner, 2015) and
- the promotion of electric mobility to establishing Germany as a leading market and supplier for the production and expertise of electric vehicles. In particular, it supports Germany's ambitious goal to release one million electric cars on German roads by 2020 (Academics, 2012). The government and the public (consumers) are placed as key actors in the market roll-out of the electric vehicle (Tschoerner, 2015).

In May 2010, the German Federal Government developed the National Electric Mobility Platform (NPE), consisting of representatives from politics, industry, science, local authorities and consumers. The purpose of the initiative is to direct and shape the road map for the realization of the objectives laid out in the National Development Plan for Electric Mobility (GTAI, 2016). In particular, NPE is an advisory panel for the government, which describes the measures proposed in the National Plan in greater detail and promotes direct dialogue between research, businesses, the government and the public (Academics, 2012). Among others, the National Development Plan for Electric Mobility proposes financial incentives for research funding in order to enhance the production and efficiency of electric vehicles. In this context, and in response to the findings of the second report of NPE, the Government adopted a Government Program Electric Mobility in 2011 with main purpose to support R&D measures to enhance the synergies within the smart mobility sector (Augenstein, 2014).

4.1.2 Brief history of electric mobility (and transport system) in Munich until 2012

In Germany, the construction of highways was primarily a political decision made by Hitler. This infrastructure, which was created without the presence of cars in the first place, enabled the dominance of cars as a transport mode after World War II (Interview 5, ll. 181-183). Subsequently, in the 1950s and 1960s car utopia, private car was seen as the future of individual transport and promised unprecedented growth for the German economy, rendering Germany an automobile industry-based economy and German cities (including Munich) automobile-dependent. Although there existed several suburban railways and the first electric tram appeared already in 1895, an extensive, integrated and efficient public

transport network only came to Munich with the Olympic Games of 1972. Around that time, the tariff union MVV was founded (1971), the electrified suburban railways were connected through a tunnel crossing the city east to west (S-bahn), the electric subway (U-bahn) opened in 1971 and the tram network reached its biggest extension, while more recently in 2008 Munich released its first hybrid buses (MVG, 2010). MVG is the Munich Transport Corporation and a daughter company of Stadtwerke Muenchen (SWM), which is the public energy provider of the City Munich and is in turn owned by the City. MVG operates U-bahns, trams and various buses (there are several smaller companies, which operate buses as well), while S-bahns are operated by Deutsche Bahn (DB). Since 2006, when the Transport Development Plan of Munich was released, the City tries to achieve sustainable mobility through improvements in public transport and multimodality. Consequently, the public transport network in Munich is generally considered to be efficient and appreciated compared to other European cities (Interview 8, ll. 129-131). However, some experts claim that public transport has reached its limits recently due to the rapid population growth in Munich in the last decade and transport planners emphasize the urgent need for more investments in infrastructure for public transport and slower modes of transport, like cycling and walking (Interview 4, ll. 158-160; Interview 5, ll. 30-31).

Although the biggest part of public transport was already electrified in Munich, the topic of electric mobility was officially picked up around the time of the release of the National Development Plan for Electric Mobility (2009) through the State of Bavaria's interest in the city's cooperation on federally-funded projects. The Christian Socialists were primarily interested in the potential of electric mobility to contribute to market growth and to establish the automobile sector (which is strongly represented in the state) as a secure long-term provider of green mobility services (Tschoerner, 2015).

The City of Munich (including the city's public electricity provider – Stadtwerke SWM - and public transport authority MVG, which is daughter company of Stadtwerke) along with researchers and the private sector began testing how electric vehicles could be introduced, integrated and installed in the current transport system along with building and operation of charging infrastructure (Interview 47-49, ll. 32; Tschoerner, 2015). Specifically, Munich was designated as one of the Electro-mobility Model Regions for the time period 2009-2011 by the Federal Government in order to participate in a federal funding initiative promoting and supporting electric mobility. The Electro-mobility Model Regions promotional program was a key element of the National Development Plan for Electro-mobility for realizing the promotion of research and development, market preparation and introduction of electric cars. The City Energy Provider (SWM), functioning as a private entity but owned entirely by the City of Munich, coordinated the first projects related to the installation of charging systems and modes of transport (including buses, taxis and the

city's vehicle fleet) (Tschoerner, 2015). Some of the programs implemented as a part of the project included Munich public transport experimenting with hybrid buses, and most notably, automakers BMW and Audi launching fleet tests of their prototype BMW Mini E and Audi A1 e-tron vehicles (Interview 6, ll. 32; Swancott, 2012).

In particular, SWM, SIEMENS and the BMW Group launched a pilot project, namely "Drive e-Charged", to test electric vehicles in terms of users' requirements and establish a grid of charging stations around the city. The project, which ran from March 2010 to June 2011, aimed at expediting the market introduction of electric battery-powered cars and the corresponding charging infrastructure in Munich – the electric car user is placed as the focal point for the development of marketable electro-mobility concepts-, primarily for the purpose of reducing traffic emissions. SIEMENS developed a charging infrastructure consisting of 32 public stations and 36 home charging stations, while SWM supplied the stations with green electricity. The BMW Group enlarged its fleet with Mini e-vehicles. The program was funded by the Federal Ministry of Transport and Digital Infrastructure (BMVI) with 115 million euros in funds from the Second Economic Stimulus Package (Press documents for the eCarTec, 2010).

Another project, called "e-flott", started in spring 2011 and was also supported by the Federal Ministry of Transport. It was a joint effort by AUDI, E.ON, SWM and the Technical University of Munich (TUM) and its primary focus was data transfer between the driver, the car, the charging point and the power grid. In particular, the test drivers' mobility behavior was recorded by smartphones – from cycling and electric cars to buses and trains. E.ON installed 100 charging stations in and around Munich and enhanced communications with the grid operator (SWM). TUM recorded and analyzed driver's mobility behavior and AUDI offered its Audi A1 e-tron vehicles for tests. Here again, the consumer was at the center of e-mobility promotion (E.ON, 2010; Interview 1, ll. 16-20).

The core actors in the initial promotion of electric mobility in Munich was the Federal Government and private sector (auto-mobility industries), who related electric mobility in Munich with the Federal Government's strategy about green growth, particularly framing electric mobility as the electrification of the private car (Tshoerner, 2015). The role of private sector is dominant in the initial promotion of electric mobility in Munich, while planning had the coordinating role of *"integrating electric mobility in the existing transport carriers, modes and in the form of concepts in particular*" (ibid). In this phase, the City of Munich did not consider electric mobility as a strategy that could have significant impact on local transport problems, rather the uptake of electric mobility was a "*politically driven decision by the European Commission and the German politics*" (Interview 5, ll. 14-16). The public-private synergies promoting Munich as the leader of the electrification of the private car in the global market were apparent, which was also explicitly expressed in the international media:

> "*With the cooperative partnerships and solid government support for sustainable transportation, Munich is creating the future of driving. Munich will make its mark globally, just as it has done with traditional combustion engine automobiles"* (Swancott, 2012).

The emphasis on the electrification of the private car is also illustrated in MVG's (2010) report Sustainable Mobility for Munich, where it is claimed that an improvement of CO2 result in Munich is possible mainly through the reduction of fossil fuels for motorized individual transport, because potentials for savings in energy consumption for public transport in Munich turn out to be lower because the tram and underground are already electric.

Overall, electric mobility in Munich was initially driven by the Federal Government and was positioned as an urban policy issue promoting the electric car for *"short trips*" and "*neighborhood traffic*" (Tschoerner, 2015). The key point of the initial promotion was the merging of economic interests of the automobile interests with the state's ambitions to improve air pollution. However, this initial promotion had little to do with addressing policy issues related to mobility at the local level, as it failed to articulate key problems in the transport sector, something that can be further elaborated by its weak articulation at the local level in Munich (Tschoerner, 2015). The weak articulation of electric mobility by the local authorities can be further highlighted by one of the interviewees' statement:

> "*We didn't take it very seriously (…) because we said there are too many questions (…) you know these discussions about charging capacity(…) about ecological footprint (…) about range (…) and with all that we got the impression that this new topic dominates the discussion (…) but we wanted more investments in public transport and cycling (...) they didn't do these investments and discussed about electric mobility instead (…) so it was a playground for us (…) we did not take it very seriously"* (Interview 5, ll. 27-33).

In other words, the period 2009-2012 was an experimentation phase with federally funded pilot projects, while there was no actual formulation of electric mobility policy at the local level, since the concept of electric mobility was very new for the local authorities. The allocation of the responsibility for the coordination of the topic to SWM plays also an important role, as although SWM is owned by the City of Munich, it is also a company with its own interests. For this reason, the local authorities of the City of Munich were not really familiar with the topic.

4.1.3. Current policy initiatives about electric mobility since 2012 and political – administrative landscape

Administrative change & the Municipal Sustainable Electric Mobility Concept

From 2012 forward, the coordination of the topic switched from SWM to the local administration, namely Department of Health and the Environment, which is a key administration in Munich addressing climate protection. It was then in 2012, when the local administration took over coordination of the topic that the City of Munich began more actively defining a local policy for electric mobility and local actors began questioning to what extent the electric mobility debate actually reflected local practices (Tschoerner, 2015). As a result, the local administration - particularly its transport planners and other administrative officials, who had played more of a coordinative than a planning role in the initial years of federally-funded projects – along with SMW-MVG, automobile industry and research institutions developed the Municipal Sustainable Electric Mobility Concept in 2013, as an attempt of *"fundamentally reviewing and redesigning the given mobility structures, including the transport infrastructure"* through electric mobility. The discussion was about how electrification of the urban transport system can promote specific infrastructure and technologies to address urban transport problems. In this context, there were articulated specific ideas and policy approaches for developing electric mobility through enhancing conditions to combine different modes and to promote new forms of movement (such as car-sharing, bike-sharing, public transport) (Referat für Gesundheit und Umwelt, 2013, author's translation). At that stage, the promotion of both private and commercial electric vehicles was discussed (Interview 3, ll. 10-11, Interview 5, ll. 185-186).

E-plan Munich

In the meanwhile, the uptake of federal-funded programs continued. As all the interviewees stated, the most important federal financed pilot program was E-plan Munich, which started in March 2013 and finished in February 2016, as it focused on a study about how electric mobility will affect future urban development, infrastructure and transport system planning. In particular, in 2012 the Germany government selected four regions in the country to act as "Showcase Regions for Electric Mobility", which is a demonstration project included in the measures of the Government Program for Electric Mobility (2011). Munich is represented in the "Showcase Bavaria-Saxony ELECTROMOBILITY CONNECTS" initiative and E-plan was one of the key projects of this initiative (Schaufenster-elektromobilitaet, 2013; Interview 8, ll. 60-63; Interview 2, ll. 45-48). It includes three demonstration projects designed to collect information on user behavior, technical and town-planning requirements, and to develop an infrastructure planning process (Schaufenster-elektromobilitaet, 2013):

- The "*Residents parking*" subproject used 15 Audi A1 e-tron cars to determine the usage potential of electromobility by people who want to drive a private electric car, but they do not have access to their own private charging stations (ibid).
- The "*e-Car-sharing*" subproject added 20 BMW ActiveE units to the car sharing pool of Drive Now. The aim was to design an operating concept tailored to electric vehicles, study charging behavior on public roads, and find ways to forecast demand at the respective locations and to make e-car-sharing vehicles available where needed (Interview 6, ll. 56-59).
- The "*Electric taxi*" subproject will study the everyday suitability and economic viability of the Nissan Leaf type electric taxis used for the environmentally friendly transport of patients between the different sites of a hospital in Munich, with charging power generated by an in-house solar power system (Schaufenster-elektromobilitaet, 2013).

The findings of the three demonstration programs were used for the development of a master plan called "*E-mobility infrastructure of the state capital Munich*" project in order to plan and implement the charging infrastructure required for promoting electric mobility in the city through an infrastructure planning process (ibid). The Military University of Munich along with the Department of Planning developed a system to estimate the demand of charging stations. The results demonstrated the problems that people have (e.g. waiting time at the charging stations) and there was an attempt to improve infrastructure, but it was a hard process because of bureaucratic reasons and splintered responsibilities between the Departments of the City (Interview 8, ll. 40-43; Interview 2, ll. 49-50).

Figure 2: E-plan Munich, Source: Schaufenster-elektromobilitaet (2013)

Munich Electro-mobility Initiative (IFEHM)

The outcome of the discussion of the Municipal Sustainable Electric Mobility Concept (2013) was the adoption of a comprehensive package of policy measures, namely the Munich Electro-mobility Initiative (IFEHM), in May 2015 by the City of Munich, which entered into force on the 1st of April 2016 (Referat für Gesundheit und Umwelt, 2016, author's translation). According to all the interviewees, IHEFM is the first concrete initiative of the City to promote electric mobility and the most important one, since it includes direct financial measures. As an interviewee said: "*now they are doing the promotion, before it was just pilot programs from the government*" (Interview 1, ll. 21-22). According to the interviewees, Munich is the first city in Germany, which is committed in such a financial policy of direct subsidies (Interview 6, ll. 96-97; Interview 8, ll. 20-21; Interview 1, ll. 23-24).

The program is supported by almost all parties in the city council and there was no great debate about its implementation (Landhauptstadt Muenchen, 2015, author's translation). The objective of the initiative is to promote and increase the number of electric vehicles in Munich significantly in order to reach the goal of 17.500 electric vehicles by 2020, which is the contribution of Munich to the government's goal (1 million electric cars in Germany by 2020) and has been calculated proportionally (Interview 8, ll. 80-82, Interview 4, ll. 134-135). Furthermore, it aims to promote electric mobility through multimodality. IFEHM aims at tradespeople, professionals, companies, charities, car-sharing providers, while individual car users are excluded (Emobilitätonline, 2015, author's translation; Völklein, 2015; author's translation). In particular, a financial package of 30 million euros has been designed for the promotion of electric vehicles for the years 2016 and 2017 (ibid), which will grant:

- 22,2 million euros for premiums two, three or four-wheeled electric battery vehicles (no plug-in hybrids or vehicles with a range extender) for companies, businesses, freelancers and NGO's (e.g. craft shops, taxi operators, retailers, care and delivery services) as well as car-sharing providers. In particular, the subsidies are the following:
    - Four-wheeled electric vehicles (either passenger or trucks and taxis) up to 4000 euros
    - Three-wheeled vehicles (e.g. Lasten pedelecs) 25% of net costs, up to 1000 euros
    - Two-wheeled electric vehicles (including electric scouters and pedelecs) 25% of net costs, up to 500 euros
    - 1,000 euros for each electric car that directly replaces a conventional combustion engine car
    - Companies and individuals (it is the only measure that includes individuals) that put a special charging station on the wall of their garage will be compensated with 20% of the cost by the city and up to a maximum of 1500 euros per

charging point and 500 euros when the vehicle is loaded exclusively with green electricity.

- 1.5 million euros for the construction of 100 public charging stations (200 charging points in total) are granted to SWM for the next two years, while there is a program with charging stations for the integration of pedelecs (e-bikes) in the public bike sharing system MVG Rad.
- The rest 6.5 million euros will go to MVG for the purchase, testing and integration of 2 electric buses to their fleet and the organization of workshops (Emobilitätonline, 2015 author‘s translation; Völklein, 2015, author’s translation; Landhauptstadt Muenchen, 2016, author’s translation; Referat für Gesundheit und Umwelt, 2015; author’s translation; Interview 6, ll. 98-106; Interview 3, ll. 9-10, 61-62; Interview 8, ll. 62-64).

Figure 3: Map of charging infrastructure in Munich (blue: existing charging stations, green: future charging stations, red: fast charging station, yellow: charging stations integrated into traffic lights; black: server locations), Source: Völklein (2016)

Private used electric cars are not promoted, because the City does not want to spend any money to support the purchase of second or third cars. This is because there was a lot of criticism that electric vehicles would be used as symbolic status by affluent people, who would use them as second cars (Interview 8, ll. 22-23; Emobilitätonline, 2015, author’s translation; Völklein, 2015, author’s translation). Another reason is that there is already policy from the Federal Government which determines the motor vehicle tax by the amount of CO2 emissions (Interview 8, ll. 26-28; Squarewise, 2010, M. van der Steen et al,

2015), which favors private electric vehicles, while the Federal Government announced recently (in April 2016) a separate funding program for the purchase of private electric vehicles (Interview 8, ll. 28-29; Völklein, 2016, author's translation).

Electro-mobility Act

A month after the City Council's decision about IHEFM (June 2015), the Federal Government passed an official law about electric mobility (Der Ausschuss für Verkehr und digitale Infrastruktur, 2015, author's translation; Kuhr, 2015, author's translation). The act aims to provide the legal framework for the promotion of both electric and hybrid cars at the local level, while it is up to each municipality how and whether they will localize the law and to what degree (Kuhr, 2015, author's translation; Interview 6, ll. 60-62). The main initiatives of the act, which are not directly financial, include release of the bus lanes for electric cars in inner city districts, priority parking, free of charge parking in license areas, reservation of parking spaces close to recharging stations exclusively for electric cars and access to areas in which traffic is restricted (The Local, 2014; Lang 2014; Der Ausschuss für Verkehr und digitale Infrastruktur, 2015, author's translation).

The city of Munich along with a lot of other Germany cities, local transport companies and the Germany Association of Cities submitted its rejection to the release of bus lanes along with other German cities, since Munich does not have a lot of km of bus lanes and wants to keep them only for buses to support the public transport (Zeit, 2015, author's translation; Interview 3, ll. 49-51, Interview 7, ll. 58-63, Interview 8, ll. 135-137). In particular, the head of MVG, Herbert König sent a letter to the Trasport Minister Dobrindt stating that:

> "*Munich could only share 1.7 km bus lanes with e-cars" out of 22km of specialized infrastructure (used by buses and trams). As a result, the congestion in those bus lanes, being used by buses, trams and e-cars at the same time will get much worse and the driving too slow. Therefore, such busy bus lanes will not be attractive for e-car owners and potential buyers and users. In this sense, it would be counterproductive, if the bus lanes that are created to speed up the transport flow are mixed*" (Kuhr, 2015; author's translation).

MVG also brought as an example Oslo, that has already implemented such a scheme and is facing a couple of transport problems, namely, the buses departure times and connecting trips cannot be achieved while bus lanes are shared with conventionally powered vehicles (Kuhr, 2015, author's translation). The city decided to keep the part of the act that gives the opportunity to reserve parking spaces for electric cars next to the charging stations. In particular, around each of the 100 charging stations that will be built from the subsidies of the city of Munich 2 parking spaces for electric cars will be reserved (Interview 6, ll. 62-65).

Administrative and political landscape

The administrative situation around electric mobility topic in Munich is complicated, especially in terms of charging infrastructure. In particular, in the city's administration, five different Departments are responsible for electric mobility: the Department of Health and Environment for the coordination of the topic, the Department of Urban Planning and Building Regulation for the strategic planning of charging infrastructure, the Department of Public Order for the permission for charging stations, parking in terms of road infrastructure, road signs and integration of car-sharing with electric mobility, the Department of Construction for the building-up of charging infrastructure (along with SWM, which is responsible for the installation) and the Department of Labor and Economics for the funding of charging infrastructure. The main reason that there is so much fragmentation of responsibilities between different Departments is that there is not a Department of Transport in the City. In other words, the topic of electric mobility goes through different fields and authorities without any of them being in lead and nobody being expertized in the topic. Although there are a lot of negotiations and discussions between the Departments, their communication is impeded by bureaucracy and misunderstandings (Interview 8, ll. 9-12, 43-46; Interview 2, ll. 50-54; Interview 5, ll. 36-49; Interview 4, ll. 19-26). Furthermore, some interviewees expressed concerns about the low effectiveness and delay of the administrative authorities regarding the uptake of electric mobility, which can be attributed on the one hand to the fragmentation of responsibilities, on the other hand to weak political intervention to the administration (Interview 4, ll. 28-33).

Regarding the political situation, a Red-Green Coalition used to be in charge since 1990 in Munich. Thus, it was the only city in Germany, where the Green party, which is quite open to sustainable topics, was in power. However, this changed two years ago, when the Greens lost the local elections and the social democrats (SPD) and the conservatives (CSU) resumed office instead. The two big parties, especially the conservatives, are in favor of car-oriented policies, which means that it is easier for them to change mobility technology than to change mobility behavior: "*The reason they like the electric mobility topic so much is because they think that it solves all problems using clean technology*" (Interview 5, ll. 107-112). This can be further illustrated by the fact that the CSU and SPD parties wanted initially to finance also private cars, claiming that householders have "*no significant incentive to purchase a vehicle, which would otherwise be scheduled*" (Völklein, 2015, author's translation). Another example is that both CSU and SPD supported the measure of release of bus lanes for electric vehicles in Munich (included in the federal electro-mobility act) in the beginning, taking as an example Oslo. However, they realized that if they finance private cars and release the bus lanes, it would be difficult to communicate such a strategy without facing any opposition. As mentioned before, Munich is currently facing problems with its transport system related to space, overcrowding in public transport, limited

capacity of public transport during the peak hours, traffic congestion and of course pollution, because of its rapid population growth. Therefore, the two big parties decided that it is better to finance infrastructure and develop the legal framework, instead of directly giving money to private households, which would cause reactions regarding transport problems (Interview 5, ll. 115-118).

Within the bigger picture of urban development and transport planning in Munich, electric mobility is included in the updated version of the city's urban development concept "Perspektive Muenchen" (Perspective Munich), which foresees the development of Munich as "compact, urban and green", as an element that contributes to sustainable mobility (Department of Urban Planning and Building Regulation, 2013). The Transport Development Plan of the City, which was published in 2006 and is part of "Perspektive Muenchen", does not contain the term electric mobility and the city officials are preparing an updated version of it, where the role of electric mobility in urban mobility will be analyzed (Interview 8, ll. 34-18). Furthermore, charging infrastructure for electric mobility is one of the topics of interest in the "Vision Mobility 2050", which is a concept based on the discussions of the public-private cooperation "Inzell Initiative", which has been founded for the discussion and elaboration of urban mobility in Munich (Innovationsmanufaktur, 2013; Kesselring, 2016). Recently, there has also been created the pre-political platform for electric mobility "E-Allianz" (E-Alliance), which is also a part of "Inzell Initiative", where all the important stakeholders can discuss strategic issues about technology, stakeholder networks, laws, what actions are needed and develop strategies for the promotion of electric mobility (Interview 5, ll. 88-90; Interview 3, ll. 30-31; Interview 8, ll. 173-174). Overall, since the topic of electric mobility is still new for the local authorities, its presence in local official documents about urban development and transport planning is still limited.

4.2. Storylines

In this section the main storylines surrounding the discourse of electric mobility in Munich will be analyzed by identifying the metaphors, arguments and practices that the main actors use in their discursive strategies. The focus is on the current discourse (from 2012 until now) and the point of departure of this discursive analysis is the fact that electric mobility is promoted as a panacea for sustainable mobility problems and urban development in Munich. For instance, Joachim Lorenz, director at the Department for Health and Environment, stated*: "Electro-mobility means for transport and energy a paradigm shift. We have it in hand to set the right course for the future of mobility in Munich"* (Landhauptstadt Muenchen, 2015, author's translation), while the deputy mayor and chief of the Department of Labor and Economy Josef Schmidt (CSU) sees in electric mobility an "*important building block foresighted for urban planning*", and he continues, "*the associated opportunities electrify me*" (Völklein, 2015, author's translation). The purpose of the following discursive analysis is to reveal how different stakeholders perceive electric

mobility, what discursive strategies (metaphors, arguments and goal-directed practices) they use and what interests they have. It has to be mentioned that the bold marks in the text are used to highlight the metaphors used by the actors. At the end of each analytical chapter that presents a storyline, there is a short concluding section, where the metaphors, arguments and practices employed by the actors as well as the discourse coalitions that are being formed around the storylines are discussed.

4.2.1. Electric mobility as a means to support multimodality

As mentioned before, since 2013 there has been a discussion in Munich about the potential electric mobility has to support multimodality and new concepts and services of mobility, such as car-sharing and bike-sharing in order to reduce traffic congestion and car-ownership as well as integrate electric mobility to the public transport system. The following session identifies which actors surround the storyline of electric mobility as a means to support multimodality and analyzes their arguments, the metaphors they use and the practices through which this storyline is being reproduced.

Transport planners of the Department of Public Order

The Department of Public Order supports multimodality through electric car-sharing, because the transport planners believe that electric mobility and car-sharing are mutually beneficial:

> "*if we have to do electric mobility, the best idea is to start with car-sharing (…) because car-sharing is positive, because of the sharing effect (…) even the new full flexible free floaters (…) we did a big evaluation and we recognized that one free floating car substitutes three private cars, if you take the parking lots away(…) if not the others will buy new cars again (…) So we said car-sharing is positive and if we make electric car-sharing is more positive (…) because it combines two good innovations*" (Interview 5, ll. 50-55).

In other words, there will still be cars in the city, even with electric car-sharing, but because of the reduction of the car-ownership, the people who share the cars change their mobility behavior: "*they won't go 12000 km per year, they will go 6000 km per year (…) I hope that sharing services will be a good platform for electric vehicles*" (Interview 5, ll. 61-64, 211). Furthermore, a transport planner from the Department of public order emphasized the importance of smart technologies in multimodality: "*To me, smart integration would mean to use all modes and all vehicle technologies in a smart way with my smart phone (…) physical, virtual and tariff integration*" (ibid). The Department of Public Order was, among others, involved in a federally-funded research project, which was about an evaluation of electric car-sharing in Munich and Berlin and the development of a handbook about car-sharing and electric mobility for German municipalities, indicating what is necessary for

charging infrastructure, what laws have to be taken into account or modified and what kind of marketing is needed (ibid).

SWM-MVG

SWM-MVG as the public transport provider and the energy supplier of the City of Munich supports multimodality with electric mobility and recognizes the convenience it entails for commuters. As an interviewee from SWM-MVG stated:

> *"Electric mobility is a way to support new ways of commuting (….) of course pretty much we support multimodality, as we operate the public transport and also provide individual public mobility by bike-sharing (…) In the mobility stations you can have multi and inter modality, so that people living close to such a mobility station do not need their private car (…) they can decide which mode of transport or combination of modes they need according to their commuting needs each time"* (Interview 6, ll. 77-81).

The aforementioned quote emphasizes the flexibility multimodality entails and electric mobility is perceived as a good way to promote alternative ways of commuting, but it does not really articulate the contribution of electric mobility through multimodality to the mitigation of transport problems. This can be further illustrated by the following quote:

> "*I don't really want to mix-up the problem of traffic in general with e-mobility. E-mobility cannot solve all problems in terms of space, for example (…) Electric car motion is like taking the same space as with a normal car and parking as well. So, I would like to divide these two aims: traffic reduction and e-mobility in terms of reduction of emissions, because sometimes people tend to discuss both at the same time and they say if we enhance e-mobility, we enhance cars (…) I don't want to discuss both of them (…) I think as a city you have to have a plan for space and traffic reduction (…) but in terms of e-mobility projects, I would like to talk about a part of the traffic plan, which says the city's aim is to reduce traffic, to get individual commuters from cars to other modes, like pedelecs, bikes (…) and if that is not possible, traffic should be managed in a sustainable way…and this is the third part that e-mobility comes in (…) that is how I would define it*" (Interview 6, ll. 15-26).

The above quote denotes that electric mobility is perceived as a distinct policy in relation to traffic policy and it is primarily useful as a third stage in the transport policy for the reduction of emissions.

One of the key actions to bring multimodal transport to life was the opening of Munich's first mobility station in November 2014 during the EUROCITIES Annual Conference at Münchner Freiheit. Münchner Freiheit mobility station is a pilot project that is currently

one of a kind in both Germany and the whole of Europe aiming to function as a key local public transport node that brings together underground, bus and tram lines, while five parking spaces have been reserved for car-sharing offerings**,** two of which are for electric cars, as well as the public bicycle hire system "MVG Rad" has been established. A charging station run by SWM ensures that these cars are always ready to roll, while a central information pillar informs users about the different mobility options available with real-time data. The basic goal of the station is to provide sustainable solutions for individual transport without car ownership, which will lead to a reduced need for parking space, more attractive public spaces and higher quality of life. The mobility station was built and operated by SWM-MVG on behalf of the city of Munich (Department of Labor and Economic Development, 2015; Interview 5, ll. 216-217), while the Department of Public Order coordinated the process. Furthermore, there are new ongoing E.U. funded projects that support more mobility stations: 12 are included in the project "Smarter Together" which is guided by SMW-MVG, 8 mobility stations are included in the project "City to share" which is guided by the Department of Urban Planning and BMW and 2 mobility stations in the project "Eccentric" guided by the Department of Public Order (Interview 5, ll. 222-226).

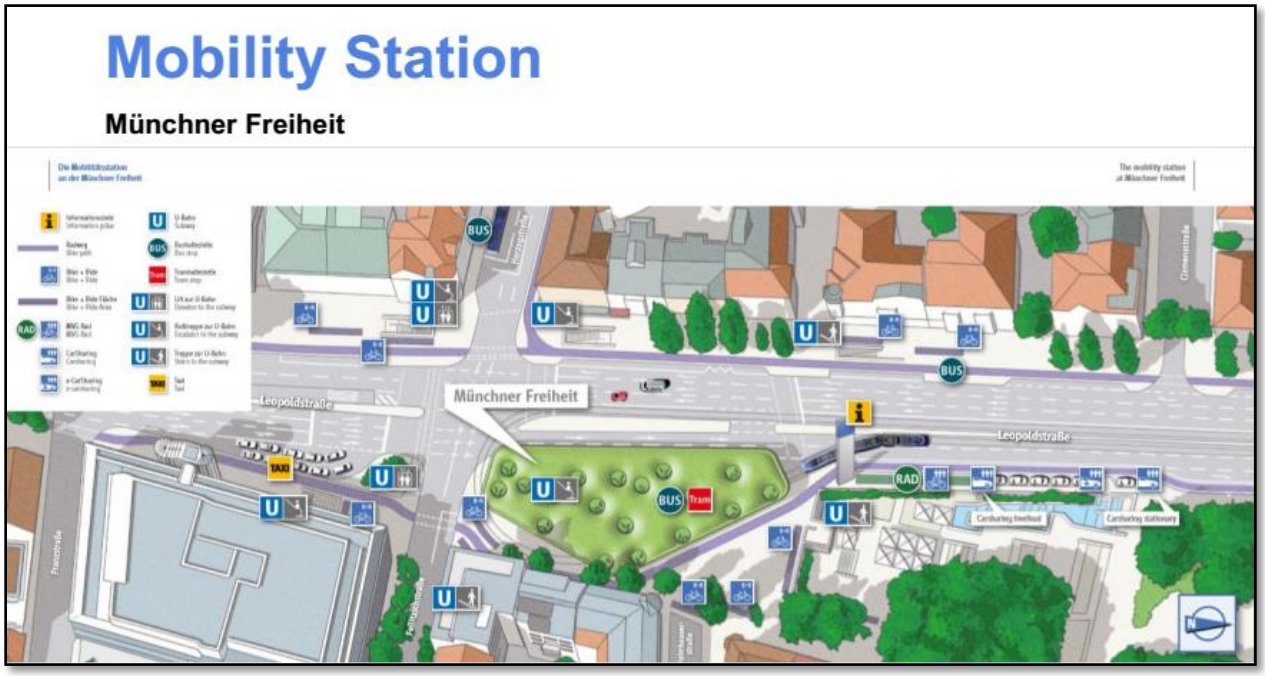

Figure 4: Mobility Station Münchner Freiheit, Source: Schawohl (2014)

Mobility stations offer physical integration of different modes, but there are also mobility apps for virtual and tariff integration, where users can receive information in their smart phones (Interview 5, ll. 217-219). For this reason, SWM-MVG have projects with the car-sharing provider Drive Now to integrate the e-car-sharing fleet (and also normal car-sharing fleets) in a mobile App, where users can have multimodal transport in one app and

see in real time all e-car-sharing options as well as other transport options next to them. Moreover, SWM-MVG has several projects concerning grid integration for charging infrastructure (Interview 6, ll. 49-54).

Local Politicians

Regarding the local politicians, "*one major point is that we have more and more traffic and if you say electric mobility, they also think about new mobility concepts, such as car-sharing"* (Interview 2, ll. 87-88). In other words, they mostly see electric mobility as an opportunity for new ideas and possibilities that would be "nice to have" in order to promote the image of the city towards multi-modality. However, their main concern is not that much to promote electric car-sharing, but mostly to support the small and medium sized companies by financing them to buy electric cars, and also develop charging infrastructure. The only political party that highlighted the importance of electric car-sharing from the beginning was the Green party, while the other parties were holding back (Interview 3, ll. 52-53). The reason is that most local politicians, especially the conservatives (CSU), have a more conservative mindset and they do not want to do anything against the dominance of cars (Interview 5, ll. 134-135). However, now they are convinced by transport planners and BMW that through electric car-sharing, there will still be cars on the streets with the advantage that users will not have the commitments a private car entails (taxes, insurance, regular service), while at the same time the City can show that promotes multi-modality. As a transport planner said, "*it is a matter of diplomatic language…you don't say to them that you want to reduce car-ownership*" (ibid). For this reason, the financing of car-sharing providers is included in the financial measures about electric mobility (IHEFM) of the City. As a member of the SPD party said "*now we give the permission to bring more and more electric car-sharing cars on the street and I think Drive Now, it is BMW, will bring out a few hundred electric cars*" (Interview 7, ll. 66-67).

BMW

The whole topic about electric car-sharing is pushed mostly by BMW and Drive Now (Interview 7, ll. 64). As an interviewee from BMW stated:

> "*We are convinced that the combination of electric mobility and car-sharing is one* ***big part of the solution****, as car-sharing has the big potential to reduce traffic in cities. We had to struggle a lot with this argument, because hardly ever someone in the city really believed it*" (Interview 4, ll. 38-41).

The interviewee from BMW continued describing the vision of BMW about the contribution of electric mobility to urban development:

> *"We have everything we need (…) we have electric mobility, the availability of live data, because everybody has a smart phone, the offer of stationary car-sharing, free floating car-sharing. Actually we just need to combine this to*

> *make a **better offer to the customer**, so the customer can say that maybe it is not the best solution for me to have my private car. Reducing private cars enables a city to make city planning in a completely different way and could have a **massive impact on traffic**, parking and the whole city environment. If we somehow manage to reduce private cars in the city, we would not need that **much parking space**, because the cars are just not there and you can use the free space which you gain for any other purpose in **city planning (**…) we see the demand in city planning (…) how a city can develop in 20 years (…) people expect that a city is not only a place where you live and you work and it is ugly, but people expect a city to be a **livable place** and really the car-ownership is the key. If you manage to get people to get rid of their car, you see that the mobility behavior of these people massively changes"* (Interview 4, ll. 45-52).

The above quotes denote that BMW uses arguments about the benefits that the combination of electric mobility and car-sharing could have, namely, reduction of car-ownership, thereafter traffic, benefits for city planning (more space, livable cities etc.) to promote their new mobility services. They claim that they "*see the demand in city planning*", positioning themselves as experts in transport planning and policy-making, while they follow a more diverse strategy than before promoting a brand new multimodality package, comprised of sharing services (taking the side of sharing mobility providers, such as DriveNow) and live data through smart phone applications in order to provide more tempting offers to the customers.

Another argument stated by BMW is that people do not have to buy a very expensive electric vehicle, but they can test it with car-sharing:

> "*With electric car-sharing you have access, because they are available everywhere, you can easily have access and have your own experience. One point is that some people think that electric vehicles are not fun cars (…) that sustainable cannot be fun (…) they cannot imagine how an electric engine works (…) if you get an experience with car-sharing and then you want to buy a car, you might consider to buy an electric car, because you had this experience with car-sharing*" (Interview 4, ll. 73-78).

This implies that one of the strategic goals of BMW is the promotion of car-sharing as a way to promote private electric cars in the long-term by giving people the chance to test electric cars through car-sharing.

Conclusion

The discourse coalition that has been formed around the storyline of electric mobility as a means to support multimodality is mainly comprised of SMW-MVG, public transport

planners (represented by the Departments of Public Order), local politicians and BMW. SMW-MVG uses the metaphor "*a way to support new ways of commuting*", but without articulating electric mobility as a policy solution for transport problems. The transport planners use metaphors, such as "*flexible*" electric car-sharing, "*two positive innovations*" for electric mobility and car-sharing, and sharing services as "*a good platform for electric vehicles",* arguing that that electric mobility are two mutually good innovations that can gradually change people's mobility behavior and reduce car-ownership. BMW uses the metaphors "*big part of the solution*" for the transport problems, "*massive impact on traffic"* and electric car-sharing impact on "*livable places"*, taking the position of the main speakers of transport policy and articulating a more aggressive strategy than the rest of the actors, while they try to gain public acceptance to promote their economic interests through diverse strategies but also through the indirect promotion of private electric cars. All of these actors emphasize the importance of sharing services and digital integration to transport. For most politicians electric car-sharing is a nice policy to have to show some action towards multimodality, but they do not really perceive it as a way to tackle traffic problems. Overall, the discursive strategies used by different actors reveal different motivations, with the private sector being the main driving force in the diffusion of market-driven solutions in Munich through the promotion of multimodality. All the actors collaborate with each other to reproduce the storyline of multimodality through a multitude of practices, namely, mobility stations, projects about digital integration through smart phone applications and smart grid integration, evaluation report and guidebook for electric car-sharing, the financing of car-sharing and bike-sharing providers from the City to change their fleet to electric cars and the part of E-plan that deals with electric car-sharing.

4.2.2. Electric mobility as solution for environmental problems storyline

The reduction of air pollution and noise though electric mobility is the most commonly articulated storyline for the promotion of electric mobility in all the official documents of the City of Munich, such as the Municipal Sustainable Electric Mobility Concept and the Munich Electro-mobility Initiative (IHEFM), while it manifests in most public statements. In the following, it is identified which actors are joined by the story line of electric mobility as the solution for environmental problems in discourse coalitions as well as their arguments, metaphors and practices.

Local Politicians

One of the reasons that there was no great debate about the implementation of the financial strategy of IHEFM was that nearly all parties think that electric mobility is the way to reduce local emissions (Interview 3, ll. 14-15). Specifically, there is a big discussion about the NOx emissions in most big cities in Europe, especially in Germany and Italy, because they have a lot of diesel vehicles and have exceeded the limits of fine dust, NOx and

CO2 (Interview 5, ll. 6-8). The City of Munich observed really severe issues with the air quality, especially with NO2, which comes mostly from diesel and burning gas in households. There is a limit from the E.U. of 40 NO2 micrograms and in Munich there is an average of 100% above this limit (Interview 4, ll. 4-8). In particular, the State of Bavaria (which is responsible for the prevention of pollution) was accused at the European court for exceeding the limit of NOx, mainly because of Munich, which is the capital of Bavaria (Interview 5, ll. 146-148; Interview 1, ll. 29-30). At the same time, the city of Munich has a strategy to reduce CO2 by 80% until 2050 (Interview 4, ll. 9-10). Subsequently, one of the City's strategies to reach these goals is the promotion of electric mobility through the Munich Electro-mobility Initiative (IHEFM). As a member of the SPD party stated, *"cleaner air, it is just better for the environment…in some parts of the city we have a lot of problems with air pollution*" (Interview 7, ll. 12-13), while a member from the Green party said "*If we take climate protection seriously, we need to advance the promotion of alternatives to internal combustion engines*"(Galler, 2015, author's translation).

All the interviewees stated that the most important reason for the local politicians to support electric mobility is the reduction of emissions, but also noise: "*noise is a major issue in every big city. Munich is not such a big city, but noise is also here a big issue*" (Interview 4; 35-36). This can be further highlighted by the mayor's Dieter Reiter (SPD) statement, who is one of the earnest supporters of the City's financial strategy for electric mobility as a means to environmental sustainability:

> *"In order to make e-mobility sustainable, we need to improve the framework. With the planned municipal subsidies for commercial vehicles and the expansion of the charging infrastructure, we make a big step towards the right direction. At the same time, the city has to lead by example and gradually change our own fleet to electric vehicles. The aim must be to convert all municipal vehicles on* ***environmentally friendly technology*** *in the not too distant future. Electro-mobility is an* ***integral part of a future-oriented urban development****. Electric cars are not only clean, but also much quieter than vehicles with internal combustion engines*" (Landhauptstadt Muenchen, 2015, author's translation).

However, there was some discussion, especially from the Environmental Organization "Green City" and transport planners, about if it would be better the City to invest more money in public transport and cycling infrastructure than electric mobility and reduce individual motorized transport by cutting off public car parking spaces within the middle ring of the city or introduce an emission toll, in order to reduce the emissions and noise (Interview 5, ll. 31-32; Green City, 2015, author's translation). As mentioned before, most of the local politicians (especially the conservatives (CSU) and social democrats (SPD)) would not like to do anything against cars, which can be illustrated by a statement of the

CSU party: "*well we want to drive our cars and electric mobility is the **way to drive our cars in the near future**, because we need to reduce the emissions and noise and also drive our cars*" (Interview 3, ll. 16-18), and this is a matter of the general German political mentality: "*a car-oriented country like Germany would rather change the fleet than change the mobility behavior*" (Interview 5, ll. 10-11).

Another interesting question is if the energy used for the charging of electric vehicles is green. A member of the SPD party answered:

> "*sorry but I am just thinking first for the city (…) well if you do not use green energy for the electric car, there will be emissions, but you don't have the problems in specific locations of the city(…) there is one wind park in the north of the city, but it is just one (…) but we are investing a lot of money in having clean energy (…) we invest in bigger plants, parks and offshores that produce a lot of energy"* (Interview 7, ll. 24-29).

This implies that the City of Munich is mostly interested in solving the local emission problems in the short-term, but the overall environmental impact (e.g. at a regional level) in the long-term is not their main concern.

Administrative officials and transport planners

The administrative officials and the planners of the City of Munich seem to agree that electric mobility is the solution for environmental problems coming from transport, as the following quotes reveal:

> "*That is the first time that the Departments agreed (*…) *It is important, because of all the advantages electro-mobility has; especially pollution, noise and these are the most important advantages*" (Interview 8, ll. 19-20, 48-49). "*It will solve the local emissions problems*" (Interview 21). "*It is the **sustainable factor** for cities to become greener and reach a **better quality for living**"* (Interview 2, ll. 11-12).

Although everybody agreed that electric mobility is a way to reduce environmental impacts, there are different opinions among the city officials about if there are other alternatives to electric mobility in order to achieve this goal. For instance, an interviewee from the Department of Public Order said that normally if the City wants to reduce the emissions and resolve transport problems at the same time:

> "*we should improve our public transport, we should improve our regional planning, we should put a lot of money into cycling, we should change public space from the cars to cyclists and then we would probably reduce the rate of the motorized traffic (…) this rest we should transform to clean technology,*

> *but at first we need to do our homework and then have this* ***playground***" (Interview 5, ll. 169-173).

This implies that investment in electric mobility should not be the priority of the city and there are also other ways to reduce the emissions.

Another interviewee from the Department of Urban Planning said that the best solution would be an improvement in the technology of the engines, but electric mobility is also a good choice because it is also a technological advancement: "*The best way to reduce the emissions would be to reduce the emissions of the engines of the cars (…) that is why electric mobility theoretically is good"* (Interview 8, ll. 126-127). This quote demonstrates a belief in technological solutions for urban mobility problems. Moreover, the need for the diffusion of electric vehicles was emphasized, in order to improve air quality: *"we have problems with emissions in the middle ring (…) we have 150.000 cars everyday (…) you should have 10% or 20% electric cars, otherwise you will not have any effect*" (ibid).

The fact that the reduction of emissions and noise are the main reasons of the promotion of electric mobility is also reflected into the positioning of the Department of Health and Environment as the coordinator of electric mobility policy in Munich (Interview 6, ll. 3-5).

Automobile industry

In 2014, the European Commission reviewed its legislation about the limits of CO2 emissions from 2009 (Regulation No 443/2009) and set more strict legally-binding targets for new cars to emit no more than 95 grams of CO2 per km by 2020, while the limit before was 130 grams/km. If car manufacturers don't reach this target by 2020, they have to pay fines of 95 euros per vehicle per gram/km. As one interviewee said, "*this is the real driving force for industry to deal with electric mobility, because they have to pay a lot of money if they don't reach this target"* (Interview 2, ll. 8-10). This can be further highlighted by the fact that the car industry did not react so actively in the first years of electric mobility promotion in Munich (before the strict limit of 95 grams/km), "*because they want to sell the old technology as long as they can (…) not so many developing costs and so on (…) they sell so many SUVs (Sport Utility Vehicles) and very non-ecological technologies*" (Interview 5, ll. 12-14). Only more recently, when the European Commission set this limit, automobile industry and especially BMW started acting more vigorously to expedite the diffusion of electric mobility. As an interviewee from BMW stated:

> "*We really put a lot of effort in pushing electric mobility (…) if we as an industry do not offer emission free mobility, we will not manage to reduce the emissions which are caused by individual mobility (…) Angela Merkel has the goal of 1 million electric vehicles by 2020 in Germany and they calculated the share for Munich and they ended up with 17500, but they never asked us which amount of electric emission free mobility we need here to meet the goals*

> *(…) I mean 17500 is just a number, maybe it's 5000 or 50000 (…) that is what we are actually doing with the City of Munich right now (…) we are modeling how many electric vehicles would have so much impact on Munich emission issues and this should be the number in the end (…) we are trying to adjust the number to the needs of Munich. You always have to focus on the problem and then find solutions and not just taking any numbers* "(Interview 4, ll. 117, 120-121,134-141).

The above quote confirms that BMW are trying to secure their position in terms of CO2 limits, in order to meet the goals of the E.U. If the reduction of CO2 emissions is a common problem for everybody, BMW's "*focus on the problem*" is not to spend money on fines and secure their economic interests, which are inextricably related to the reduction of emissions in this case.

Another argument articulated by BMW is that they want to be ready for the global transition to emission free mobility in cities, so they can secure their position in the market:

> "*All the cities in Europe and worldwide try to solve environmental problems (…) Norway decided not to register any cars that are not emission free (…) the point is not far ahead (…) at some point cities will not have other solution than just closing the city for particular vehicles (diesel) or at a point to the whole traffic (…) we want to be prepared for this point (…) maybe not in 2020 or 2030 but maybe 2040 every car must be completely emission free (…) the* ***future of mobility is emission free***" (Interview 4, ll. 118-126).

Conclusion

The discourse coalition that is formed around the storyline of electric mobility as a solution of environmental problems is comprised of the local politicians (especially the Mayor and the two big parties CSU and SPD), the administrative officials and transport planners and the automobile industry. The metaphors used by the local politicians are electric mobility as "*environmentally friendly technology"*, *"integral part of a future-oriented urban development"* and "*way to drive our cars in the near future"*, which shows the importance they give to electric mobility regarding environmental improvement, but also reveal their car-oriented mindset and their preference in technocratic solutions in solving urban problems. The public officers use the metaphors "*sustainable factor*" for "*better quality for living"* in cities and there is a general consensus among them about the contribution of electric mobility to environmental improvement. Two different opinions between the public officers are identified. On the one hand, electric mobility is presented as a "*playground*" that is good to have, but priority should be given to investments in improving existing infrastructure (public transport, bike lanes etc.) and changing people's behavior in

order to reduce the emissions, on the other hand the improvement of the technical characteristics of the vehicles is presented as the best solution for the reduction of emissions and noise revealing once again a technocratic perception of urban mobility. The automobile industry uses the metaphor "*the future of mobility is emission free"* to put forth the argument that automobile industry is interested in reducing emissions in the cities, because they have to reach the goal of E.U. and catch up the transition towards emission free mobility to secure their economic interests. The practices that reproduce this storyline are the positioning of the Department of Health and Environment as the coordinator of electric mobility in Munich as well as the collaboration of the City of Munich with BMW in modeling how much vehicles are needed to reach the CO2 goals of the E.U.

4.2.3. Electric mobility as a green growth intervention storyline

Electric mobility promotion in Munich reflects, among others, economic arguments intertwined with environmental protection. In the following, the storyline of electric mobility as a green growth intervention will be analyzed, while the actors surrounding it will be identified, as well as their arguments, metaphors and practices.

Local Politicians

The local politicians try to accelerate the uptake of electric mobility in order to enhance the local economy of green technologies and create job positions: "*the city has a lot of manufacturers or industries or people with jobs mostly linked to technologies that can be relevant in the future (…) so of course they probably do it to support the economies around*" (Interview 2, ll. 93-96). This emerging economy consists of battery suppliers and small start-up companies like car producers that gradually acquire more power in the market.

At the same time, the City wants to keep the traditional automobile industry in the game, because it constitutes a vital element for the city's competitiveness and economic prosperity. This can be further illustrated by the fact that the Green party claimed that the financial measures of the City are not enough and the City should finance car manufacturers, such as BMW and other industries, to motivate them to produce greener vehicles. As an interviewee said about the Green party's position, (it is an) "*opposition in their role in the city council*" (Interview 3, ll. 28-32) and it actually demonstrates the Green party's belief that environmental improvement is a driver for economic growth.

Furthermore, the City wants to contribute to the government's goal of reaching 1 million electric vehicles by 2020, which approaches electric mobility through a storyline of green growth, by posing the goal of 17.500 electric vehicles in Munich, which has been calculated proportionally and without calculating the specific needs of emission free mobility in Munich (Interview 4, ll. 134-136; Interview 8, ll. 80-84).

Another argument expressed in political statements (especially from the Federal Government) is the depletion of oil (peak oil) as an economic motivation: "*with post fossil*

engines, you do not need oil (…) even though the oil prices are low now, in one month (for example) it will rise again and then it is finished" (Interview 8, ll. 49-51). However, the peak oil issue is not the main concern of the local politicians in Munich. As a member of the SPD party said, "*the peak oil issue is another important thing (…) but it is mostly a global perspective"* (Interview 7, ll. 34). The only party that thinks about the peak oil issue is the Green party, but the two big parties, which run the city government do not think about it that much, because they believe that it is a national issue and not a local one (Interview 3, ll. 43-44).

Automobile industry

Although there is a danger for automobile industries of losing their share of market from "new" stakeholders such as battery suppliers and start-ups, it seems that some automobile industries diversify their strategies and focus on green technologies to maintain their position:

> "*The market potential is huge for the suppliers for automakers (…) there will be some that will lose their market, but there will be others maybe also new ones that will switch from providing combustion engines to electric ones (…) so it is a change (…) it is a huge chance also for battery providers (…) it is a huge storage market (…) Traditional industries are in trouble, but I am sure they have a strategy…especially BMW (…) they get more diverse (…) so it is a big chance also for them*"(Interview 6, ll. 131-138).

However, some automobile companies were not very active for a while and now they are behind other companies, such as Tesla which has improved the range of electric vehicles. In particular, German companies are trying to catch up with BMW, which seems to be the main player in Munich, as well as Volkswagen, MAN and AUDI (Interview 7, ll. 73-76).

As an interviewee from BMW stated: "*we are really interested in electric mobility as a company…the* ***market potential is enormous****"* (Interview 4, ll. 117-118). BMW consider themselves as pioneers of the electric car market, which can be highlighted by the following statement: Uwe Dreher, the head of marketing of the electric car in BMW, stated that:

> "*BMWi is the first mass produced electric car to be developed* ***from scratch****, rather than other manufacturers which have sought to adapt existing vehicles. That is why the venture will succeed where other have failed. BMWi can provide* ***a breakthrough for the electric vehicle market*** *and help bring it to scale. It will be the* ***success story for electric cars***" (Confino, 2013).

Furthermore, BMW in Munich created the first electric truck in Europe along with SCHERM group contributing to sustainable transport logistics. Bavaria's Minister of Economic Affairs, Ilse Aigner stated that:

> "*Bavaria is a leading industrial and research location. It is crucial that the Bavarian economy is also at the forefront in electric mobility. BMW is making an important contribution to this and is showing that you can succeed on the global market with* ***sustainable products made by innovative companies***" (Zoebelein, 2015).

SWM-MVG

For SWM, which is both a company and a subsidiary of the City of Munich, one of the main economic reasons for the promotion of electric mobility is the current dependency on foreign oil*:*

> *"Our goals align with the city's goals, because we are both a company and we are owned by the city (…) we try to reduce traffic emissions etc., but as a company we have this economic reason (…) for instance with buses (…) we are heavily reliant on fossil fuels provided by Russia and Norway (…) so if we have the possibility to switch from fossil fuels to electric buses, electricity will be provided by ourselves (…) green electricity (…) we will be much more* ***competitive*** *and much more* ***independent (****…) that would be a main factor. For the City the dependency on oil is not the main consideration, but for SWM it is* (Interview 6, ll. 82-86)*.*

The above quote implies that SWM, as an energy provider company, looks for new markets to sell its green electricity. That could be one reason that the City subsidizes private charging infrastructure (for both companies and individuals) apart from the 100 public charging stations and gives a premium to those who charge with green energy. In particular, there was some reluctance from SWM to be in charge of the installation of public charging stations and the provision of green energy. The reason was that SWM do not earn money from the building of the public charging stations, because they are not rentable, while they cannot sell their electricity (Interview 8, ll. 161-164). As an interview mentioned:

> "*Stadtwerke (…) they have to do it, because the city says that they have to do it (…) but they don't really want to do it, because there is no possibility of earning any money or selling energy (…) so they have to pay without earning anything (…) they will receive 1.5 million euros for the construction from the city, but they have to pay for the rest" (*Interview 3, ll. 33-36).

This is probably why SWM is avoiding a direct cooperation with BMW, who wants to expedite the process of building-up charging infrastructure, for the construction of public charging stations:

> *"BMW is angry because they said that the Stadtwerke, the public supplier, is too slow and they made an offer to implement the charging stations much faster and cheaper and now Stadtwerke is more angry because they think that BMW should stay out of their business"* (Interview 5, ll. 130-132).

As an interviewee from BMW stated:

> *"We made proposals for private co-finance models for the next 100 charging stations or the next 400 charging stations together with other private companies (…) BMW and other private companies would really 100% finance infrastructure (…) Stadtwerke that is in charge of 100 charging points, they are convinced that 100 charging stations will be enough to charge 17500 electric cars (…) so we completely disagree on this (…) 100 charging stations are by far not enough*" (Interview 4, ll. 128-131, 149-152).

And the response of an interviewee from SWM was:

> *"I don't think that we need thousands of charging stations, because it is a transition phase (…) in 10 years maybe we will not talk about charging infrastructure, because we will have bigger batteries or hydrogen*" (Interview 6, ll. 139-141)

The above quotes confirm one of Augenstein's (2014) findings, in her dissertation, about hidden conflicts between OEMs and power companies, and public transport companies. SWM-MVG being both a power company and public transport company looks for new markets to sell its green energy and promote its innovative multimodal transport services, but does not want to be dominated by OEMs that buy in competences in the field of energy technology in order to promote their own interests regarding green innovations.

However, SWM can sell energy to companies and individuals, who decide to install a private charging station. Therefore, this might be the reason why although the City does not support the purchase of electric cars by private users, they support financially the private users that charge their electric cars with green energy, as an interviewee from SWM highlighted: "*they (the City) support private charging stations and they just support if there is green energy"* (Interview 6, ll. 103-104).

Conclusion

The discourse coalition that is formed around the storyline of electric mobility as a green growth intervention is comprised of the local politicians (especially the Green party), the automobile industry (mainly represented by BMW) and SWM-MVG. The metaphors used by BMW are "*enormous market potential", "from scratch"* referring to the technology of mass produced electric cars*, "a breakthrough for the electric vehicle market", "success story for*

electric cars" and "*sustainable products made by innovative companies"*. All of these metaphors symbolize the market potential automobile industry sees in the development of green innovative technologies and the competition among manufacturers for dominance in the market. One more interesting finding coming from the analysis of the discursive strategies of BMW is the strong interest of the State of Bavaria to secure the economic interests of automobile industry revealing an aspiration of Bavaria becoming a global leader in sustainable innovations. SWM-MVG use the metaphors "*competitive"* and "*independent",* which describe the company's economic interests through green electricity selling, if transportation becomes less oil dependent, while a hidden conflict between SWM-MVG and BMW was revealed that reflects economic interests related to green economy from both sides. For local politicians, the main argument for electric mobility as a green growth intervention is that they can support the emerging local economy and create jobs through local manufacturing and reach the goal of 17500 electric vehicles by 2020 contributing to the government's goal. The storyline of electric mobility as green growth intervention is being reproduced through the practices of calculating the need of electric vehicles according to the government's goal as well as financing of the building of private charging infrastructure and premiums for charging with green energy.

5. Discussion

The first section of the discussion (5.1.) will first provide a more general analysis of the storylines of electric mobility promotion in Munich in terms of what broader discourses they reflect and present evidence about the institutionalization of these discourses in international, German and Munich level in order to reveal what concepts dominate the "*mental universe*" (Fischler, 2000) of the actors (how structure affects agency) and why they act the way the act. In this first section (5.1.), the role of the broader discourses of climate change, green growth and smart cities in the discursive promotion of electric mobility in Munich will be analyzed and how all of these discourses reflect and re-strengthen the technocratic planning paradigm of the previous century will be explained. In the second section of the discussion (5.2.), the potential contribution of the discursive promotion of electric mobility to sustainable mobility will be discussed, acknowledging the role of the public planner as a potential agent of change, and giving further insights into the politics in Munich about sustainable mobility through the case of electric mobility. The discussion chapter was informed by the findings of the analysis, academic literature review about green growth, smart cities and climate change concepts, data from the interviews that were not be used in the analysis, and academic and policy documents about politics in Munich.

5.1. What broader discourses the storylines reflect

Since 2012, when the responsibility of the coordination of electric mobility topic passed to the local authorities (Department of Health and Environment), an attempt to articulate a local policy for the restructuring of existing mobility structures and tackling transport problems through the promotion of electric mobility can be observed. The main perceptions and interests of the involved actors regarding electric mobility are articulated in three storylines surrounding the topic of electric mobility in Munich: electric mobility as a means to support multimodality, electric mobility as a solution to environmental problems and electric mobility as a green growth intervention. It is notable that the same actors share all the storylines, which implies that their discursive strategies "tick a lot of boxes". In the following, the broader discourses that these storylines reflect will be analyzed as well as how these discourses have been embedded in perceptions and local practices of electric mobility discourse in Munich.

Climate change discourse vs. electric mobility discourse

Electric mobility as a solution for environmental problems clearly reflects broader environmental discourses about climate change and reduction of air pollution. These discourses that are omnipresent and institutionalized in international discursive practices, such as AGENDA 21, European binding guidelines for air pollution reduction, national agendas such as Germany's Climate Protection Program (OECD) and local practices, such as

Integrated Action Program for Climate Protection in Munich (IHKM), are often used as a "*smokescreen"* for rationalization of political and market-driven actions. In the case of electric mobility, sustainability discourse has been used for the rationalization of economic interests of the private sector, as automobile industry try to reach the emission reduction goals of the E.U. in order not to spend a lot of money on fines and catch-up with the global trend towards emission-free mobility in cities. On the other hand, politicians see the reduction of emissions as a necessary goal that has to be achieved, while electric mobility is a convenient strategy to achieve this goal without having to quit cars. The public planners acknowledge the appropriateness of electric mobility to emissions reduction. Some of them, being more progressive, call for more action regarding investments in public transport and alternative modes of transport, in order to reduce the pollution effects, while others suggest that the best solution would be an efficiency improvement in combustion engines articulating a technocratic perception and still maintaining a belief in technological solutions for urban problems. The planning and organizing of the topic at the Department of Health and the Environment shows the abstract relation electric mobility has to improving the urban transport system, and how it more strongly articulates the improvement of air pollution and environmental discourse more broadly.

Green growth discourse vs. electric mobility discourse

The storyline of electric mobility as green growth intervention echoes the broader national aspirations for green growth. The core meaning of the concept of green growth is that economic growth can be compatible with environmental sustainability in the future. It is based on the idea of "*decoupling"*, which refers to the urgent need of separating economic growth from the use of resources in cities (change the quality of growth) (United Nations, 1987). Green growth is supposed to cope with short-term unemployment caused by the economic recession and achieve economic growth that would avoid environmental externalities in the long term (Schneider et al, 2010). The green growth discourse has been institutionalized through organizations and agencies such as the World Bank, OECD, the Global Green Growth Institute (GGGI) and UNEP (World Bank 2012a, 2012b, 2012c; OECD, 2012; GGGI, 2012; UNEP, 2011). German government has adopted a strategy towards green growth:

> "*Germany's green growth policies have been an important engine for environmental innovation, enabling the development of an internationally competitive environmental goods and services sector particularly focused on renewable energy"* (GGBP, 2014).

In other words, green growth is seen as a driver for economic growth in German policy-making arenas. According to World Bank (2011), Germany is considered a pioneer in green growth policies and has established a strong vision for transforming its energy system.

Green growth policies are explicitly expressed in documents, such as Integrated Energy and Climate Program (IEKP) and the "Enegiewende" (energy transformation) (GGPB, 2014).

As mentioned in 4.1.1., green growth discourse is deeply embedded in national discursive practices about electric mobility, such as the National Development Plan for Electric Mobility and National Electric Mobility Platform and is institutionalized at the local level through the programmatic goal of the city of Munich to release 17500 electric vehicles by 2020, a goal tailored to Germany's broader goal of 1 million electric vehicles. On the one hand, local politicians want to support the automobile industry to produce new green technologies and continue to contribute to German automobile economy. In this case, industry and politics go again hand in hand, as automobile industry aspires to become the leader in electric mobility market globally through political support. However, they also want to support new manufacturers and start-ups to enhance also the local economy, while for SWM electric mobility is a good change to open-up new markets for its green energy, while having conflicting interests with BMW.

In this context, electric mobility as green growth intervention storyline conveys a distance and disconnection from changing discourse on transport planning in that it fails to articulate key problems in the transport sector today. On the contrary, mobility through the green growth discourse is interpreted as increasing mobility (Essebo & Baeten, 2012), which means more emission free private cars on the streets. As a result, this does not actually solve traffic problems and problems of space or accessibility, but just establishes a new form of energy consumption, without really challenging the type of production (Schneider et al, 2010), proving that green growth is a technocratic economy-oriented discourse.

Smart cities discourse vs. electric mobility discourse

Electric mobility as a means to support multimodality is the only storyline, which articulates more closely transport issues in Munich especially through its articulation by public transport planners, such as reduction of car-ownership, thereafter amount of travel, through electrified sharing services. However, it strongly reflects the economic interests of the automobile industry, who look for technological innovations and new mobility concepts, to the extent that they are the ones who steer the process of policy-making about multimodality with electric mobility. On the other hand, the local politicians and SWM-MVG do not really perceive it as a serious solution for transport problems, but as a way to improve the image of the city. This can be further seen in the practices of the actors, as apart from federal-funded and E.U. funded programs, a concrete plan about electrified sharing services is not included in any official policy documents. At the moment, the promotion of electric car-sharing does not seem to have any significant impacts to the transport system in Munich, which can be further illustrated by the following quote by an interviewee from academia: "*car-sharing (…) is good, but most of the times, it is just an*

additional opportunity for driving (…) I think that right now it does not have as much benefit as it is promoted most of the times" (Interview 1, ll. 74-76).

Besides that, except for the financing of the sharing service providers to change their fleet from conventional engines to electric, there has not been an intervention in the legal framework yet, which removes the parking lots from the inner city districts in order to facilitate the spread of electric car-sharing:

> "*There was a study a half year ago from a professor that shows that you could cut the parking places, around 1500 places in Munich, because you have this new car-sharing in Munich and a lot of people have cut off their cars and use car-sharing, so you have these space (…) 1500 car places you can cut and give it to other opportunities, like public space or for bicycle parking places and stuff like that (…) but there is also a discussion: should we do this? Should we cut the parking places? (…) and especially CSU says: no we use it, because they want cars (…) actually there is no decision yet"* (Interview 3, ll. 53-60).

Although broader discourses about digitalization of transport and sharing mobility are being gradually structurated around the storyline of electric mobility as a means to support multimodality, these discourses have not really been institutionalized yet in practices, because of the rigidity of politicians, who still believe in the dominance of individual motorized mobility. As Canzler and Knie (2016) claim, electrification of the entire transportation sector is not only necessary due to climate change mitigation, but is in line with the increased interlinking of different modes of transport into integrated mobility services. This shift is not driven only by economic and technological factors, but most importantly by important societal developments and considerations, since people use more and more their smartphones, while they use less their cars. Instead, most of the actors strongly articulate technocratic smart mobility concepts. Smart mobility is a sub-discourse within the broader discourse of smart cities, and includes new concepts of mobility, such as car-sharing, and ICT technologies and applications that enable innovations (Benevolo et al, 2016). The dominant concepts in the smart cities discourse are smart grids, efficiency, infrastructure, system, energy, monitoring and information, which highlight a managerial take on cities with the new possibilities of ICT tools being applied to urban problems, while seeing innovation as a mainly technological matter (Hajer, 2015). As in the case of electric mobility in Munich, the discourse of smart cities shapes the perceptions and practices of a multitude of actors who plan and manage cities through pilot projects, decisions and everyday action (Söderström et al, 2014). In particular, these smart concepts have been recently institutionalized in official discursive practices in Munich, such as the updated version of "Perspective Munich", which contains the new guideline "Smart City Munich", which:

> "*Illustrates how the systematic use of information and communication as well as of resource-protective technologies can help mastering the transition to a post-fossil fuel dependent society in the 21st century*" (Department of Urban Planning and Building Regulation, 2013).

The focus on technological solutions is evident in the new guideline for the urban development in Munich. Furthermore, smart concepts are being institutionalized through neo-liberal practices, such as public-private partnerships. In such a context, businesses help public service delivery function more efficiently (Hajer, 2015). This is evident when looking at the discursive role of BMW, which is actually the main actor in the promotion of electrified sharing services, who puts pressure to the local authorities to expedite the process.

Electric mobility and the technocratic planning paradigm

Looking at the discursive promotion of electric mobility in Munich, the storylines surrounding electric mobility and the discourses they reflect are interrelated. In relation to each other, each of the three storylines articulate a distinct direction of planning for electric mobility in Munich with only the multimodality storyline having a potential impact on urban development. Yet, at the same time, they also reflect many similarities, particularly in how they all articulate a focus on the dominance of the private sector private sector in the planning, organization and implementation of electric mobility.

Overall, the discursive promotion of electric mobility in Munich is dominated by technocratic and economic discourses that reproduce dominant understandings about what a good city is. The main reason is the general mentality of German politicians, who are still devoted to the predominant modernist planning paradigm of the previous century. As an interviewee said:

> *"We are right now at the stone-age of transport policies, back to the 80s* (…) *but we know that transport policy is not rational and is more economy-driven (…) it is a lobby (…) a question of lobbying and of commercial politics, not of organizing mobility*" (Interview 5, ll. 191, 174-175).

Although the technocratic planning paradigm has been generating a vast amount of unintended side effects, technology becomes again the bringer of hope to the cities in the form of smart technologies and intelligent transport systems that promise a new sustainable use of infrastructure and is supposed to generate rational behavior (Kesselring, 2016; Hajer, 2015). Instead of thinking about social innovations and qualitative growth, policy-makers use smart and green solutions as a set of ad-hoc devices, proposals and instruments that can be applied to respond by priority to the imperatives of economic competitiveness and global environmental change (Wolfram, 2012).

In this context, the main reason that technocratic discourses have become dominant in policy-making arenas is their ability to reduce complexity and provide capacity to act immediately and efficiently in urgent urban problems, which makes it difficult to reject and a convenient strategy for political majorities and stakeholders (Hajer, 2015). As an interviewee said, one reason that electric mobility has become so popular in the policy agendas is because:

> "*it is quite easy, as you do not have to take something away, it is not restrictive, it is a technological innovation and Germans like technological solutions (…) In Germany if we can solve a problem with organization or with technology, we will always choose technology (…) They do not want to have radical changes, they want to remain a car-oriented country, they want to have the control of technology and sell it on a global scale (…) that means no new public transport lines, no new bike tracks, because you need space from the other modes (…) so then everybody says that our politicians don't do anything (…) and then the politicians say: electric mobility this is a topic that we can show that we do something (…) Electro-mobility gives the conservatives and the social democrats a topic to show a positive attitude and to hide the lack of activity for public transport and cycling (…) This is a main motivation for them* (Interview 5, ll. 135-145).

In short, electric mobility is seen by policy-makers, who do not want radical changes, as a favored technological solution for the normalization of neoliberal discourses and the pursuit of economic growth.

5.2. Contribution of electric mobility discursive promotion to sustainable mobility in Munich

In the previous section we saw, how the technocratic planning paradigm is re-embedded in the public discourse about electric mobility, but also in mobility and planning policies in Munich more broadly. The question is what the potential for electric mobility is to contribute to sustainable mobility in such a discursive context. As mentioned in 2.1., electric mobility has the potential to contribute to two of the four basic principles of sustainable mobility paradigm introduced by Banister (2008): increasing the efficiency of engines and fuels through technological innovations, and reduction in the use of cars and a modal shift towards alternative modes of transport. At this moment, there is ambiguity about the contribution of electric mobility in Munich to these goals. The main reason is that electric mobility discourse has not been institutionalized into concrete practices, which can be proven by the fact that electric mobility as an element of sustainable mobility has been written into some policy documents, but there is not a concrete policy about it and it is not even included in the Transport Development Plan of the city yet. The city is still experimenting and it is too early for potential results of the policy to manifest. The local

actors are in a continuous deliberation and they keep changing policy measures or adding new ones.

In the level of structuration of a discourse about electric mobility, there is still confusion among the public planners of the different departments. First, all the transport planners and administrative officials interviewed agree that electric vehicles alone cannot solve the problems of space, traffic congestion and accessibility, despite public political statements in the media. While most of the transport planners agree that the city should give priority in investments in public transport, cycling and walking infrastructure, some of them think that electric mobility is not so necessary to achieve the goals of sustainable urban development:

> "*Our strategy is compact-urban-green, to concentrate living areas and working areas around public transport stations, high density, to have short distance, to walk, to cycle, to use public transport (…) but we have these plans also without electric mobility"* (Interview 8, ll. 116-119).

However, some transport planners in the City of Munich emphasize the potential that electric mobility has to contribute to sustainable mobility if it is included in a framework of coordinated actions, such as improving the legal framework for sharing services, i.e. the removal of parking places in the inner districts. Maybe the key for electric mobility success in terms of sustainable mobility it is not just in financial measures, but in regulatory and legislative ones. Furthermore, it is worth mentioning that the role of public planners can be crucial here. As a transport planner said:

> "*there a lot of positive things I can do without political decision (…) I can promote electric car-sharing (…) I do not have to ask the city council (…) I think that I have to accept the democratic vote and I have to find a language or argumentation which pays a little tribute to this conservative perspective (…) The most difficult job for me is not to find new solutions, but to argue, to communicate it to people who have a different culture in mind (…)* (Interview 5, ll. 195-198, 178-179).

This implies that despite the technocratic political mentality in Munich, planners with more progressive ideas can influence the policy-making process, which shows that planners as agents can have some influence over the structure. Some of the key actions related to electric mobility that some transport planners try to communicate are described in the following quote:

> "*We try to convince UPS and the economic transport companies to use big tracks only to the border of the city and then we take electric cargo bikes and bring the goods to small housing areas (…) E-cargo bikes are a good*

> *alternative for the distribution of goods, a last-mile solution*" and "*we are now discussing about having the mobility stations in the suburbs, so the accessibility is better and the costs for the disposition of the cars are less*" (Interview 5, ll. 194-198).

These activities demonstrate an attempt to decongest the city center from commercial tracks and improve accessibility to transport services for the people who live in the suburbs, which both contribute to sustainable mobility.

However, the extent to which electric mobility promotion will become institutionalized in policies for sustainable mobility in Munich has more to do with the general direction it articulates: the electrification of the private car, or the promotion of new forms of urban mobility in a congested city (Tschoerner, 2015). As one interviewee said:

> "*In Munich, the discussion is about individual and public mobility. On the one hand, some political parties say: we have to do more funding about electric mobility and think about new concepts to get more electric cars. On the other hand, others say: this is nice, but we don't want to have any individual cars in the city (...) I am not sure what is right (...) Maybe the right way is in the middle (...) of course you have to push some technologies like electric mobility and think a way how some areas in Munich can be free from individual mobility in 20 or 30 years (...) I am talking about cars (...) because if you ride a bike is a different discussion*" (Interview 2, ll. 104-110).

In the same vein, another interviewee stated:

> "*CSU does not talk about reduction of traffic (...) they said individual mobility is also there and will be there in the future, so we have to manage it (...) but the say it is not our responsibility to lower the traffic (...) the other parties said we have to lower it and improve our buses and trains and bicycle traffic*" (Interview 3, ll. 19-22).

The above quotes denote that whether electric mobility is promoted in a sustainable way or not is primarily a political debate. Although Munich has done some steps forward promoting electric mobility with multimodality and there is some action from public planners to influence decision-making, the discursive framework of electric mobility is still dominated by technocratic and neoliberal discourses, which put forth individual commercial interests of the automobile and power industry, while the impacts on urban mobility are still unclear.

The case of electric mobility gives a glimpse into mobility politics in Munich more broadly and into general perceptions about sustainable mobility. As Kesselring (2016) imparts, the

politics of mobility in Munich don't give clear directions for the future of sustainable mobility. The political mentality in Munich lacks historical awareness. In other words, the majority of policy makers fail to articulate why things are the way they are ignoring the factors that led to transport problems. This attitude reproduces the modernist planning regime of the 20th century, where positivist ideas, functionalism and the universal power of generic optimal solutions based on quantitative models were dominant (Söderström et al, 2014). This leads to the presumption that the only way to sustainability is through technological innovation, where big data and software are sufficient (ibid). As Kesselring (2016) claims, the priorities and agendas in mobility policy in Munich need update. It remains to be seen how the debate between private motorized mobility and public multimodal transport will evolve.

6. Conclusions

The starting point of the research was the fact that electric mobility is promoted as a breakthrough for sustainable mobility by the media, governments, power and automobile industry, and local policy-makers worldwide as well as the fact that there is literature gap on critical interpretation of electric mobility promotion on a local level. Thereafter, the main aim of this research was to investigate why electric mobility is perceived as an optimal solution for transport problems by analyzing the discursive strategies that are employed by the main actors in the case study of Munich, and further analyzing the broader discursive framework surrounding the discourse of electric mobility in Munich, in order to deeper understand the perceived motives of the actors. Furthermore, the research aimed to reveal the contribution of the discursive promotion of electric mobility to sustainable mobility in Munich. Munich was chosen as a subject for study for two reasons: On the one hand, because of its ambition to become a leader in electric mobility services globally. On the other hand, it is a congested rapidly growing city in the heart of Europe, which calls for urgent sustainable mobility interventions.

The theoretical framework provided a fundament to analyze the discursive strategies of electric mobility in Munich. In particular, as it was discussed in chapter 2, the argumentative discourse analysis (ADA) can be a useful theoretical framework to understand urban policy-making possesses in terms of interpreting the motives of action of different stakeholders in a wider discursive context, as the core point of discourse regarding urban policy is that the use of language can produce effects.

ADA has been operationalized by Hajer into a methodological framework for analyzing discourse. This research developed a methodological framework inspired by Hajer's operationalization of ADA. The data collection consisted of eight semi-structured interviews, key official documents and online media sources. The analysis of the data was inspired by Meuser and Nagel's analysis of expert interviews.

The analysis demonstrated that the uptake of electric mobility in Munich started in 2009 with federally-funded demonstration programs aiming to test the technologies of electric vehicles and mobility behavior of consumers. From 2009 until 2012, Munich experienced an experimentation phase regarding electric mobility driven by the federal government's aspiration to position Munich as a center for electric mobility services in order to contribute to its vision for merging energy transition with economic interests in the context of the national green growth strategy. In this period of time, there was no actual discursive articulation of local policy in Munich. The City of Munich started to localize electric mobility policy after 2012, when the coordination of the topic passed from SWM to the local administration (Department of Health and Environment). The most recent and important initiative of the City was the adoption of a package of direct financial measures aiming to finance only commercial electric vehicles and the building-up of charging infrastructure.

Focusing on the current discourse (since 2012) of electric mobility in Munich, the dominant storylines revolve around three main themes: electric mobility as: (1) a means to support multimodality, (2) a solution for environmental problems, (3) a green growth intervention. All these storylines support the promotion of electric mobility in Munich, since there was no actual debate against it. The actors identified are: public planners and administrative officials from the Departments of the City of Munich, political parties (especially the Greens and the two big parties: CSU and SPD), the energy provider (SWM) and the transport company of Munich (which are seen as one actor because SWM owns MVG), and the automobile industry. Overall, all the actors share the same storylines, which confirms the former finding that there are not actual oppositions against electric mobility in Munich (no opposing discourse coalitions). However, the discursive strategies used by each actor reveal different interests through each storyline. For example, SWM-MVG employs the storyline of multimodality to express its interests regarding the promotion of innovative multimodal services and the storyline of green growth intervention to express economic interests regarding the dependency on foreign oil. In all storylines the dominant discursive strategies are the ones that express the presence of private sector as the main force of steering electric mobility policy and pushing forward sharing services. The discursive strategies of politicians reveal their perception of electric mobility as an environmental friendly fancy solution to keep the cars in the city and secure the interests of automobile industry as well as enhance the local economy. Overall, it seems that the discursive promotion of electric mobility does not articulate a policy that solves the problems of urban transport.

Through a second more general analysis of the findings, the underlying discourses of each storyline were revealed, namely: (1) green growth, (2) climate change and (3) smart cities. The actors draw on these discourses to express their discursive strategies and rationalize but also (re)shape their interests. The findings show that all of these discourses have been institutionalized in a global, national and local level and massively shape the perceptions of the policy actors. Another crucial finding is that all of these discourses are characterized by economic and technocratic elements that position technological green innovations at the center of urban mobility. It seems that these phenomenally new discourses, which surround electric mobility discursive promotion, (re)strengthen the technocratic planning paradigm of the previous century, neglecting the fundamental societal changes in urban mobility that are being in progress in cities all over the world (i.e. replacement of cars by smart phones or increasing use of bikes).

In this discursive context, the contribution of discursive promotion of electric mobility to sustainable mobility is still not clear at all. Augestein (2014) claims that the contribution of electric mobility to sustainable mobility depends on the emergence of new functionalities, meaning digitalization of transport systems and sharing services that redefine the role of

the car. Although these functionalities have appeared in the discursive arena of mobility politics in Munich, they still remain at the level of discourse structuration, as actors are still struggling for a definition of the problem. In Munich, the debate about electric mobility actually reflects the broader debate about mobility policy, which is between car and alternative transport modes.

It is true though that the policy of electric mobility in Munich does not blindly reflect prioritization of the private car like policies in other European cities. This demonstrates that something restrains politicians with a strong belief in car-dominance from freely implementing car-friendly solutions. One factor is that Munich has been promoting a vision of a sustainable "compact, urban, green" city with a very strong public transport system for the last 10 years. In this context, it is difficult to communicate aggressive car-friendly policies, such as the release of bus lanes for electric vehicles or financing of private electric cars. Another factor is the role of the public planners. One of the main findings of this research is that through the storyline of multimodality, transport planners through communicate strategies and small steps have managed to convince politicians to improve the regulatory framework to facilitate multimodality in some cases. Of course, these actions from public planners have not had much impact on policy-making yet, but it demonstrates that there is potential coming from the agency of public planners - who are often seen as bureaucrats that have no space for action in such a conservative discursive context - that can contribute to change of mindset in relation to mobility.

However, since the main focus of the thesis was to analyze the discursive strategies of electric mobility promotion in order to answer why electric mobility is perceived as an optimal solution for transport problems, the role of the planner was not extensively analyzed. Therefore, the aforementioned finding leads to the need for further academic research for a more agency-oriented perspective regarding the role of the public planner in infusing the discourses of smart and green mobility with an understanding of what cities actually are, what their capacities are and how governance can function in order to achieve a shift towards the sustainable mobility paradigm. Such an agency-oriented perspective, focusing, for instance, on everyday practices of public planners, would give better insight into how public planners interact with politicians, automobile industry, other administrative officials and other local actors.

Another interesting aspect for further research could be to look at the procedural side of electric mobility promotion in Munich in order to investigate what alternative perspectives and opinions have been lost in an attempt to resolve conflict and reach a consensus about spending 30 million euros on promoting electric mobility, instead of using this money for more urgent mobility sectors, i.e. public transport and parking management. This would require a more detailed look at the minutes or videos of planning meetings, or attending

some E-allianz meetings, for example, in order to figure out how real interaction between the actors takes places and how positioning effects occur.

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8. Appendices

8.1 Interviewed actors

Helicopter interviews

Interview 1: Researcher at the Department of Vehicle Engineering at the Technical University of Munich

Interview 2: Head of project management at the Centre of Showcase Electro-mobility Bayern-Sachsen, Bayern Innovativ

Interview 3: Journalist at Süddeutsche Zeitung (author of articles about the political promotion of electric mobility in Munich)

Interviews with key players

Interview 4: Responsible for steering government and external affairs in BMW Group

Interview 5: Transport planner at the Department of Public Order of the City of Munich

Interview 6: Project manager for electric mobility projects at SWM-MVG

Interview 7: City Councilor at the City of Munich (SPD party)

Interview 8: Transport Planner at the Department of Urban Planning and Building Regulation of the City of Munich

8.1. Interview guides

8.2.1. Interview Guide common part (for both helicopter interviews and interviews with key players)

1. How did the story of electric mobility develop in Munich? When it started and what were the driving factors (external and internal)?
2. How is the situation of electric mobility in Munich compared to other cities in Germany and Europe?
3. What federal projects have been coordinated with the local level and what was their objective?
4. Which parts of the policy are coming from above?
5. Why is electric mobility important for Munich? What are the reasons for electric mobility promotion in Munich?
6. What are your expectations regarding electric mobility? (e.g. traffic problems, technological development, market potential, environmental improvement)
7. How does electric mobility contribute towards a shift to sustainable mobility?
8. Is there any criticism and if so, what kind of criticism?
9. What are the obstacles of the implementation of e-mobility?

8.2.2. Interview Guide additional part for key players: planners, politicians and SWM-MVG and automobile industry

1. What is your role in the process of promotion of electric mobility?
    a. What are your current activities towards e-mobility?
    b. With which departments/organizations do you work with?
    c. What are your future plans?
2. What are the responsibilities of each department in the City of Munich? How are the responsibilities distributed?
3. How will electric mobility affect urban planning, urban and transport development? What opportunities?
4. What are the initiatives (policy practices) that the city of Munich took in order to promote electric mobility? e,g. IFEHM
    a. IFEHM: What is your position towards the measures?
    b. Who supports the measures and why?
    c. Are there any alternative views?
5. How can electric mobility be integrated in the existing transport system?
6. Why electric mobility and not a congestion charging scheme? If the reason is the environmental protection, why not punish bad behavior instead of rewarding good behavior (purchase and use of electric cars)?