Ambient Air Control in Germany

Managerial perspectives on the causes of failure in the creation and implementation processes of local ambient air policies

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Abstract

All of us need to breathe. Having access to clean air is essential for life. The European Directive on clean ambient air (EU Directive 2008/50/EC) defines air quality targets, which are, in turn, directly translated to national legislation. The division of power leads to a municipal responsibility for the accomplishment of the supranational agreement. However, German municipalities significantly struggle to comply with the implementation of air quality targets, albeit local coping strategies are installed for decades. In particular traffic related pollutants display the point of concern in today's target exceedances. Though, existing concepts from different countries offer promising solution paths to resolve the problem, which is tied to traffic loads, urban infrastructures, and social desirability. Hence, evidence for mechanisms able to resolve the current policy problem is present. Therefore, this research investigates reasons why German municipalities have not yet complied better with EU ambient air quality targets, although best practices are available. To do, the city-level administration's perspective is applied. The perspective offers the best insights due to the municipal scope in the matter, which translates the responsibility to the managerial capabilities of public servants. These capabilities, in turn, reflect in content-related and procedural aspects of policy creation and implementation. Therefore, the examination comprises of two steps. First, by means of a structured comparison of local policies' logic structures, based on policy theories, the content-related aspects can be visualised and compared. By means of in-depth expert interviews, this study adopts conditions for successful policy implementation and explores how the accomplishment of these conditions are perceived by the accountable actors. The study concludes the structure in legislation and the actors' sets of values determine the current paths, which are unlikely to resolve the hazardous situations. Though, external influences, such as charges claiming the right for prescribed emission extents, positively influence the goal accomplishment of the local level, although national support is required in terms of funding and legislation. Eventually, bureaucratic burdens in investing these national funds are indicated, too.

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At this point, I want to gratitude the motivating spirits around me without whom I would not have been capable to write this master thesis. A special thanks to my mother and my stepdad who *always* support me.

I would have loved to address the same gratitude to my father. Unfortunately, he passed away during the interview stage of this thesis in December 2019. Despite the sorrowful relatedness of his cause of death and the thesis' topic, I decided to remain in the thesis' realm and to complete the thesis despite. I hope this step is a turn for the better.

My friends have a big share in my accomplishments. I do not know where or what I would be without you! Thank you, Laura, David, Adedapo, Marilena, Zoe, Panos, Vangeli and Thomas for giving me confidence in times of doubt and joy in moments of pause. A special thanks to Jan, without whom I likely would have *never* passed my first semester during the Bachelor program. Thank you, Victor and "*het Krot*", for the conversations about freedom and boundaries, politics and arts, own decisions and representations, Anarchy vs. Public Administration. *Question everything, always!* Cheers to Override Fietskoeriers Enschede. Without cycling for the company, I likely would not have gained the perspective which brought me to the topic. Cycling hundreds of kilometres on Dutch roads made me re-think my perception of transport and mobility.

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LIST OF ABBREVIATIONS

This list indicates the abbreviations used in this study.

Abbreviation	Explanation
AAQP	Ambient Air Quality Plan
BIU	Local initiative environmental preservation [Ger.: Bürgerinitiative Umweltschutz]
EGDH	Environmental and Greenspace Department of Hanover [Ger.; Fachbereich Umwelt und Stadtgrün]
EZ	Environmental Zone: designated inner city area with entry control according to vehicles' emissions
DEPL	Department for Environmental Protection; division for environmental precaution, Leipzig [Ger.: Amt für Umweltschutz, Abteilung Umweltvorsorge].
DUH	German Environmental Aid / Plaintiff: Dieselgate [Ger.: Deutsche Umwelthilfe]
DPUDH	Department for Planning and Urban Development of Hanover [Ger.: Stadtentwicklung und Bauausschuss]
NOx	Nitrogen oxides in atmosphere
RADE	Regional Administration of Düsseldorf – Department for Immission Protection [Ger.: Bezirksregierung Düsseldorf Dezernat 53 – Immissionsschutz].
RME	Regional Ministry of Environment, Lower Saxony [Ger.: Niedersächsisches Umweltministerium]
VCD	Local realm of national traffic union [Ger.: Verkehrsclub Deutschland, Kreisverband Hannover e.V.]
PM	Particulate matter with diameters of 2,5 & 10 µm

1. INTRODUCTION

Clean ambient air is essential for life and mostly taken for granted since it represents a matter of course for most of us. Despite that, a significant share of European citizens does not have constant access to ultimately clean ambient air. Consequently, the questions addressed in this research evolves from the European efforts undertaken to enhance this hazardous situation. It is hazardous because about 400.000 fatalities annually are attributable to poor air quality on the European continent alone, any further exceedance therefore threatens the condition of a liveable environment and contribute to a continuous exposure to health risks (Amato et al., 2014; Čavoški, 2017). Admittedly, the situation has been vastly advanced over the years, still does the above-mentioned figure call for action (European Environment Agency, 2013).

The production of toxic gas emissions from traffic vehicles, their impacts on the environment, and the control of these are therefore the focus of this study. The traffic sector, that is to say, the emissions by road transport present, on the one hand, a significant contribution to the problem, and on the other hand, also a policy field in which vast enhancements are still to be accomplished (European Comission, 2017). As mentioned, the European Union has already reached significant enhancements through prior policy, but non-compliance with the currently valid policy, the EU Directive 2008/50/EC represents its main hurdle today. (European Comission, 2017). Why is that the case?

At this point, the principle of subsidiarity's European history can be mentioned. It has been first applied in the context of environmental efforts in 1987, albeit not yet defined in law. The principle regulates to administer a matter on the lowest governmental level possible, and it was officially added to the Maastricht Treaty 1992 (Pavy, 2020). The implementation of the principle translates into a national liability for the target accomplishment. Germany, equipped with an economy famous for its automotive industry, integrates the ambient air targets to national legislation. An important aspect, since the EU legal non-binding character is ratified in national law with this step. An EU Directive presents the targets member states *ought to comply* with, by translating it into national legislation, the targets become *enforceable* on the national level.

The application of the subsidiarity principle results in a municipal approach in German environmental policies, where dedicated municipal departments are in charge to implement ambient air policies. Hence, the specific tasks involved in the creation and implementation processes are further delegated to the subsequent departments. Consequently, local actors find themselves in the position of 'change agents' and in this function are also responsible for reaching targets defined in EU law. What has been agreed upon the European level, must finally be executed by local policy makers. Thus, reasons for national non-compliance might be best, in the German case, investigated on the local level. Indeed, the national level may influence the local target accomplishment as well, but given the administrative

structure present in the cases, the local level might be more important here than national interpretations of the legislations.

The relevant literature argues, that local policy makers tend to lack for ambition and/or the resources to tackle situations which are called into existence by higher entities (Blake, 1999). The research by Horn et al. (2018) follows a similar vein of reasoning. By stating how the county level addresses the national level for stricter regulations, whereas the national level pushes the task back and refers to the regional field of competence, an image, arguably comparable with the principle of subsidiarity as applied in Germany, occurs (Horn et al., 2018).

Despite these tensions, the EU Directive is embedded into a wider legal framework addressing industry emissions or emission extents from agriculture as well. The policy goals are established as a response to international treaties such as the Kyoto protocol (1997) and oriented at recommendations by the World Health Organisation (WHO) (Santos et al., 2010; Stake & Mickwitz, 2003). However, as indicated above, road traffic is found to be the main contributor to the problem faced on the municipal scale (Rabl & Nazelle, 2012). Albeit promising accomplishments in tackling, for instance, greenhouse gas emissions, the road traffic sector today still represents a policy field in which great gains in terms of environmental justice and efficiency are expected. The automotive sector offers huge space for improvement, since the targets may be either reached by a change in technological developments, or simply a change in consumption behaviour (Creutzig et al., 2012; Rabl & Nazelle, 2012; Vagnoni & Moradi, 2018). Consequently, mobility in urban areas and the transport of goods are central targets areas of ambient air quality plans (European Environmental Agency (EEA), 2018). In line with pollution impacts from traffic, the policy focus shifted towards pollutants such as carbon dioxide (CO2), nitrogen oxides (NOx), and particulate matter (PM), which together build today's concerns in ambient air quality targets (Čavoški, 2017).

In a country in which the automobile industry is represented as a crucial driver for economic growth and one of the central pillars for societal wealth, the compliance with climate targets that ensure a healthy environment for its people is a delicate issue. Thinking about the widely known motto "think globally, act locally" and the subsidiary principle for policy implementation, local policy actors turn into change agents who are in charge of initiating mechanisms for implementing environmental policies. It is fundamentally important to understand the dynamics that lead to their presently given underperformance.

To illustrate the extent of this underperformance, the German Federal Environmental Agency published a study of 242 existing municipal policies in 2014, of which 137 applied for a NO_2 dead-line extension valid for a five year time span (Diegmann et al., 2014). These deadline extensions are included in the action plans, which function as an add on for the AAQP for special circumstance. Considering the claim for deadline extension shows that yet more than 50% of municipalities included in this study installed insufficient measures to cope with extreme events of weather or irregular traffic volumes, or

perceive the last decade as a special circumstance for which the action plans shall account. That implies the same actors who design these policies in the first place acknowledge their work from the foregone twelve years to be insufficient in order to comply with the policy.[1] In other words, 50% of all municipalities affected by the ambient air directive have asked for a five-year chance of last resort in order to avoid infringement procedures.

The right to clean air, meaning municipalities installing effective measures embedded in short- and long- term policies, is legally enforceable. As a consequence, some municipalities are now legally obliged to ban Euro-5 diesel engine cars from particularly polluted roads, since no other measure could reach the desired condition of clean ambient air. This is arguably not the most effective measure on a city-wide scale, partly due to displacement effects, in which the pollution simply "moves" elsewhere but 70 percent of German municipalities in 2017 have simply not been able to come up with more efficient measures. Consequently, these cities face the results of infringement procedures (Horn et al., 2018). The compliance is further put under pressure by the importance of the road transport regime using fossil fuels: road transportation increased by 71% within the last 30 years in Germany, and cars have a share of "83.1 % of inland passenger-kilometres in the EU in 2015" (Bundesregierung, 2019; Geels, Turnheim, Asquith, Kern, & Kivimaa, 2019, p. 32).

1.1. Varying Perspectives on Non-Compliance

What answers for the question of non-compliance does the literature offer, what solution paths are present which might be applicable in Germany, too? First of all, studies from diverse fields agree on a central feature in the study of environmental problems. However it must be noted, the topic of ambient air pollution control is on the one hand, a pure technical subject including technological developments and different measurement technics, and on the other hand subject to (subjective) regulation, which locate in social sciences. This divided problem background might mislead the course of this research. To remain in the realm of social sciences, the following chapters neglect the role of natural sciences in the subject to some extent. Instead a focus is put on the social perceptions regarding the results stemming from studies of natural sciences. How are the technical facts socially dealt with? In this context, Oreskes (2004), advocates the difficult role of science, albeit the impactful contributions of science in environmental protection because: "who among us would know there was global warming without scientific evidence to that effect?" (Oreskes, 2004, p. 270). Or as Mickwitz (2003) postulates, no environmental problem would exist, unless this problem is in fact perceived as a problem. Here, science contributes to a knowledge bases, which happens to be put in question by others. In different words, for a problem to become a problem, one must acknowledge a fact as a *problem*. If these facts, however, are not directly associated with a problem outcome, one might be tempted to dismiss an eventual relation.

[1] If comparing the moment in which the particulate matter (PM10) and nitrogen dioxide (NO2) were defined by law as pollutants, hence the time span between Directive 96/62/EC until Directive 2008/50/EC)

Moreover, meteorological events or geographical characteristics alone may influence the degree of pollution already. Viewed from this perspective, the problem can either be framed as difficult to tackle or becomes easy to ignore, given the problems' fluid nature. The issue of haze domes spreading over urban areas or the lack of air circulation as contributions to pollution is known since the 1980's (Bauriedel, 2018). The city of Stuttgart presents a continuous example for the existence of haze domes: the directive's targets are not met and the city's valley location is used as a claim for conceding exceedances in the long run within the policy (Regierungspräsidium Stuttgart, 2018). Worth mentioning, we talk about particles of diameters smaller than 2,5µm. Air pollution cannot, if hardly ever, be seen with the naked eye. Nevertheless, haze domes may explain stagnating air quality progression, but these do not justify further pollution given the existing law. The problem identified for the study of environmental issues is the definition of a policy problem, as scientific evidence can be used to interpret challenges in a way that fits the situation and interests of responsible actors.

The technological aspects related to the problem at hand have been mentioned above. In this vein, Čavoški (2017) speaks of unintended consequences regarding the EU's ambient air endeavours. She argues, that by focussing on one kind of pollution, ambient air policies have created a market tension towards diesel. This tension is a result of a cooperative act between EU policy makers and the automotive industry. Albeit successful in terms of more strict regulations fostering a more environmentally friendly transportation, important aspects were forgotten too, as Čavoški (2017) argues. According to the author, local policy makers whose task it is to design and implement measures tackling the pollution were forgotten to be included in the goal-setting-process (Čavoški, 2017). As such, the pollution problem caused by road traffic has been acknowledged taken up by the industry and EU level regulators, though has this cooperation reached its boundaries, as the Dieselgate and current situations on the local level present. The scandal is found to be a significant hurdle in the matter of air pollution control (Moradi & Vagnoni, 2018). Automobile manufacturers coded software in which emission test environments are recognised and emission exhausts for the time being tested correspondingly lowered (Transport & Environment, 2018).

Howsoever created, the question for solution paths for resolving the problem situation should be addressed, too. To commit to a task or not to commit, to acknowledge a problem or not, is perhaps a question of capacity. In this sense, Taylor et al. (2012) speak of capacity of the regulators. Their paper suggests the capacity for changing negative outcomes depends upon the ability to understand regulations' implications, and the ability to manage the risks related to the policy, but also to see the business opportunities behind a new implemented regulation (Taylor et al., 2012). A change is desired, or as presented, reluctantly adopted from science, yet the solutions of current challenges are either not identified or generate great uncertainties. According to Taylor et al. (2012), local policy makers, instead of filling the void of uncertainty, they surrender the objective. Pollution, as examined in this research, is created by road transportation. But, how is this term defined and what needs to be considered? Transportation can be defined as a composition of traffic, mobility, and accessibility. Traffic simply

refers to vehicle movement, mobility to the transport of people or goods, whereas accessibility approaches the former two by the likelihood of receiving mobile goods by means of traffic (Litman, 2003).

What is done elsewhere to combat traffic loads and to master mobility issues arising from cutting traffic, while still providing accessibility (Litman, 2003)? Accessibility is therefore important to consider, since it displays one element of traffic. If one considers alternative solutions or the adaption of innovations in relation to traffic regulation, these paths may create costs, which in turn, create a undesired entry barriers (Horn et al., 2018). A regulative and innovative approach in regard of synergetic solutions is included in the idea of Smart Cities. These include a less intense focus on traffic solutions per se, since the overall development of urban spaces is guided by sustainable solutions by e.g. shorter distances for citizens to reach daily destinations. In the framework of Smart Cities, novel concepts of mobility are more likely to be adopted (EC, 2016; Luftqualitätsplan Hannover, 2011). In other words, fostering an urban development adjusted to modern societal needs creates less traffic while environmental impacts of mobility and use of resources are considered by better accessibility.

Another solution to improve traffic and mobility are pricing models with which areas for inner city access permissions for car drivers are created (Maruyama & Harata, 2006). In cities like London or Stockholm, congestion charges have been introduced and like that, the traffic problems largely resolved (Olsson & Davis, 2017; Rietmann & Lieven, 2019; Santos, 2017). Since the current policy objective is directly related to traffic loads in inner cities, limiting the amounts of traffic may therefore bare the answer. In this connection however, the frequent concerns about damage for inner-city retail business must be stated. Research addressing these claims finds evidence for the contrary; a greater purchasing power is found within cities with less traffic (Daunfeldt et al., 2013). Moreover, it has been found that regulative concepts limiting traffic positively influence the adaption of alternative means of transport, such as electronic vehicles (Rietmann & Lieven, 2019). This means that a positive, albeit to the status quo restricting, policy indeed supports the anticipated developments towards less and "cleaner" traffic. As such, one may compare these push and pull factors with the chicken-and-egg problem: evidence is present that a restriction of the status quo indeed fosters the acceptance of the desired state (Olsson & Davis, 2017). Are these steps implemented in Germany, and if not, why did this not yet happen? This question is further motivated by scholars addressing the limited attention for the reasons why a certain policy intervention works or is selected over another (Keele et al., 2015).

In addition to these examples, the academic world delivers a variety of concepts theorising the adaption and transition of new technologies, which this research is considering on the side. To name a few concepts, the Contextual Interaction Theory (CIT), Strategic Niche Management (SNM), or the Multi-Level Perspective (MLP) link the burdens and benefits of new technological entrants in a society and suggest solution paths (Bressers & de Boer, 2013; Geels & Schot, 2007; Panetti, Parmentola, Wallis, Ferretti, et al., 2018; Warbroek et al., 2018). Transition studies in the realm of urban pollution and the

adaption of new transport solutions indicate similar factors hindering the process of ambient air quality control and vice versa, specify drivers for the adaption of new technologies. The list of causal technology drivers is long and overlaps with afore mentioned concerns to some extents. The presence and the articulation of a common vision suiting social desirability, a market formation to foster "technology diffusion in mainstream markets", "the availability of complementary technology", while destabilising the existing transport regimes are stated to causally relate to technology transitions towards more sustainability (Panetti, Parmentola, Wallis, & Ferretti, 2018, p. 1010). However, these factors are kept broad if one is referring to local implementations of ambient air control measures. More details were brought forward by Moradi and Vagnoni (2018), albeit for the Italian context. They found, amongst other factors, urban transport system not being joint together properly in an environment which is referred to AUTO-city, which promotes the automobile as a dominant means of transport (Vagnoni & Moradi, 2018). The theory chapter will address in more detail how these ideas are going to be considered in the frame of this work.

To summarise, it has been presented how the objective of clean air evolves from European legislation and how the embedded targets translate to the national context. Germany has been presented to be an appropriate case to investigate, given the broad non-compliance and the societal aspects connected with the problem cause, the automobile. It is put in question what reasons account for the non-compliance. Linked to this non-compliance are the characteristics of transportation, for which traffic, mobility and accessibility must be considered within the local policies. In addition, and due to the environmental context, the policy problem has been presented to be of a complex nature, whose solutions involve lengthy processes, which opposed local policy makers in the role of 'change agents' to a broad field of challenges. These were presented to be between the extremes of 'not worth the effort' and too complex to be resolved amongst the unequal distributed interests of involved agencies (Geels et al., 2019). Additionally, evidence to overcome these issues has been presented, and how this step requires a surpassing of perceptions from local policy makers. Therefore, local policies established as a response to the EU ambient air targets display the focal point of this study. Finally, the goal of this research is to identify factors which on the one hand hinder the creation of more effective policies, and on the other hand, aspects which hinder anticipated implementation processes, to ultimately deliver reasons why German municipalities do not effectively comply with the EU ambient air targets. The agenda is motivated by the obvious problem cause and existing concepts of how these issues can be successfully administered, while being in the stage light of non-compliance.

For doing so, the path of investigation pursued in this master thesis comprises as follows: the following chapter theorises the subject and moreover presents the research questions addressed in this research. The methodological approach to answer the posed questions is dealt with in chapter three. The analysis' results are presented in chapter four, which are discussed in the subsequent chapter five. Lastly, the results are concluded in the chapter six.

1.2. RESEARCH QUESTIONS

The research seeks answers in both local ambient air policies and perceptions of responsible policy makers regarding the implementation context and process, for the question why German municipalities do not meet the targets embedded in the EU ambient air quality directive. As such, local policies are examined according to differences in approaches towards the policy problem cause, to then explore facts or events which explain eventual shortcomings in the implementation processes. As Leeuw (2009) argues, little attention has been paid to the questions of "how and why" certain effects are produced in environmental policy (Leeuw, 2009, p. 20). That being said, this research goes beyond the comparison of installed measures by including the perceptions and explanations for currently installed measures. This is important to address since the problem cause is particularly found to be the motorised road traffic. Hence, the work intends to explore reasons which positively or negatively affect the policy designs and implementation processes in relation to this problem cause. Conclusively, the following research questions are addressed:

Research Question: What are the reasons for the non-compliance of German municipalities with EU ambient air quality targets in Germany from a local perspective?

Sub- Question 1: How do municipal governments control the ambient air quality target accomplishment in comparison to one another?

Sub- Question 2: What reasons do the actors involved in the local processes provide for the exceedances in respect to the implementation conditions?

How these questions can be put in a theoretical frame, can be read in the next chapter.

2. THEORETICAL FRAMEWORK

This chapter is going to theorise the steps which control the ambient air quality in Germany. To recall, it is put in question why German municipalities are struggling to comply with the ambient air quality targets. This is of special interests because although installed measures exist for about a decade, the targets have not been accomplished in every town affected by the EU directive. The shortcomings in goal accomplishments are likely due to malfunctions of the local policies, since these legally account for the EU demands. Like that, it becomes apparent how the content and implementation of the local air policies (ambient air quality plans; AAQP) display the core of interest for this research. Ultimately, the creation and implementation of local policies represent the most significant area for public action to combat urban pollution and other climate-related issues on the local level. Respectively to the policy targets, it can be expected that either the policy has an error in its inherent logic mechanism, or the design is well created, but simply not well implemented. Additional factors, such as national legislation or market trends might account for the changes in air quality on the local level, too. Though do these play a subordinated role in the analysis, due to the aforementioned assumptions. For theorising the, in this perspective, insulated policy steering power in connection with the problem, the paper by Sabatier and Mazmanian, bearing the title of *The Conditions of Effective Implementation: A Guide to Accomplishing Policy Objectives* (1979) is used to compile the overarching framework for this thesis. The framework is used because it displays an assembly of prior best-implementation-practices, and like that, illuminates the subject of public-policy-implementation from a variety of scientifically valid angles. As a result, the theory comprises the five conditions to be complied with in order to reach a publically desired end state by means of public policy. This is a handy tool, because the concept provides all conditions to be met if a policy ought to reach a goal. Since the goals are not met, the explanation for the non-compliance must be found in at least one of these conditions. Moreover, the concept's application as the primary lens for this research bears the advantage of retrieving an insulated picture of local policies, with policies being the *main switch* for clean air on the overall process. This limited perspective is an important aspect to consider, given more recent, and differing research outputs of related fields. These perceive the, for instance, a goal achievement by policy as a coordinative act between levels and different agencies. In short, these concepts provide a broader scope and hence, likely a more detailed image of the drivers for failure in the current case. To account for this weakness of the current theoretical model, further concepts are reviewed and positioned against, or rather *within*, the current framework as adopted by Sabatier and Mazmanian (1979).

As must be noted once more, a policy intends to accomplish a desired end state. Though, each public action, every installed measure, every scope of one's of the five conditions may also produce intended and unintended side-effects. These might be perceived as both positive, as well as negative. For taking these into account, an item is added to the concept. The side effects may have a strong negative influence

in regard to the policy goal. So, even though a policy is rightfully implemented, it is not freed from also creating an undesired damage. Vice versa, it is also possible that side-effects are contributing the policy target indirectly. To remain in a concise set of conditions, these possibilities are summarised within one item of *policy side effects.*

Tracing back to the concept's weak point of approaching the target accomplishment from the narrow policy perspective. As mentioned, research concepts established more recently go beyond the insulated display of single policy evaluations as conducted here by including a policy as one element in a change or transition regime. It has been mentioned how every public action may also produce desired side-effects, or how national policy may influence local actions. Therefore, we now reflect upon some assumptions stemming from these broader concepts. Ideally, aspects from the broader perspectives can be adopted into the narrower perspective as applied here.

Albeit these theoretical constructs bear a different name, the concept refers to alike aspects in the matter. As such, a technological transition can be compared with the current endeavour of clean air. The damages of current technologies and user practices are evident, requiring a technological transition to resolve the problem. Hence, the target accomplishment can be understood as the result of the adoption of new technologies. This claim might be supported by the Dieselgate. Initially it was intended to adopt new technologies, and like that, contributing to the clean air targets. To name a related concept which understands the transition process as a wider interplay of different actors and levels, the multi-layer perspective (MLP) can be consulted. The concept perceives technological transitions (TT) as an non-lineal interplay along landscape, regime, and niche level by addressing the question of "how TT come about"? (Geels, 2002, p. 1257). Broken down can be said, the concept argues innovations located in technological niches are being brought up by a patchwork of regimes, which in turn, experiences mostly unilateral influences from the landscape level. Some innovations are adopted by a broader society, whereas others remain the niche level, despite support. The uptake of niches might experience a boost through shocks on the landscape level creating an entry space, or be as well hindered by lock-in effects on the regime level, making it difficult for new entrants (Geels, 2002; Kemp et al., 1998).

That being said about the 'broader' concept, how can the insulated policy perspective be connected with the MLP? The idea is to integrate parts of the MLP into the current framework, to remain open for the wider context, while remaining in the narrow local policy perspective. Not opting for a sole MLP approach has several reasons. A support for the selected approach can be found in other studies using different theoretical concepts, nevertheless relying on the importance of local policies (Blake, 1999; Chapman, 2007; Geels, 2018; Marletto, 2014; Vagnoni & Moradi, 2018). Regardless the concept, scholars from different disciplines examining the field of sustainability and decision making agree on the impacts of policy in regard to change. Yet, if now one is to identify the desired state of clean air as a result of innovative efforts, the local administration with its policy as the regime, and the EU and national legal context as the regime's landscape level, a sole MLP application on the current research

objective becomes imaginable. Especially, since the concept's application on the topic of ambient air policy has been successfully conducted on the Italian case, as conducted by Moradi and Vagnoni (Vagnoni & Moradi, 2018). Hence, a similar study would contribute to the European wide perspective of the situation by transferring their findings on the same subject to the German case. As a consequence, the MLP application would be possible, though would the trade-off be a limited attention for the local polies. Yet there are additional aspects worth to consider under the current set of questions: The MLP addresses the public uptake regarding innovations and seeks paths of how windows of opportunities can be created by a patchwork of regimes. Though, the paradigm in which this research locates is slightly different. Here, local policy is not understood as one part of a regime administering the change. Instead, the ambient air policy has significant more importance in the overall process. That is to say, the local policies are perceived as the change regime *itself*. That is so because the local air policies list all public efforts in relation to clean air on a municipal level. Note, the local ambient air policies with included action plans go beyond traffic related measures and further consider emissions stemming from construction works or small sized furnaces, as well. Indeed, only local level, traffic related measures are examined in detail, but is this perspective further motivated by the domestic principle of subsidiarity as applied in Germany. If one is to regulate the federal issues of inner-city pollution, one significant source for the noncompliance with EU law, one must investigate local ambient air regulations. Moreover, not every municipality exceeds the target values, hence the federal stake in the execution of the national legislations does not account for the differences on the local level, since the national laws apply to every municipality in Germany. As a result, the focus remains on the 'individual' efforts paid on the local level. Moreover, this study compares different cities within the research sample. This process, indicating an ex-post evaluation of local policy, would complicate an exploration with the ex-ante MLP lens.

However, if one now transfers the elements of the change regime, innovations and the external landscape influences from the MLP into the implementation concept applied in this research, it furthermore could be argued that it is unlikely for a sole policy to introduce a (local) transition on its own. Indeed, and as mentioned above, the applied framework does not perceive the local ambient air policies as the only switch to change. Yet, it also has been presented how public action concentrates on these policies in the subject in Germany. Therefore, local polices will remain the main switch to be triggered for the desired end state. Yet, to also account for the determining factors embedded in the transport regime, as proven evident by Moradi and Vagnoni (2018), the following section will establish a connection between the 'insulated' policies, and the wider structures present in the transport regime as indicated by related concepts.

By including regime determinants as found by an application of MLP onto the same topic with a different case, one can explore to how regime aspects reflect within the German local policies. To put in in different words, the regime as found in the MLP is turned 'inside out'. That results to the regime being integrated within a policy. This step can be also justified if one is looking at the commonalities of the theory behind the implementation factors and the MLP. The cited implementation theory views

public agencies as “bureaucracies with multiple goals”, while being in a constant exchange with other actors more and less involved in the overall process as policy subsystems (Sabatier & Mazmanian, 1979, p. 487). From the ‘bureaucratic view’, the process can be equalled to a regime bringing forward innovations and the external compared with a regime as one element in the regime network as found in the MLP.

For utilising the concept’s overlap with the MLP and prior contributions from the research field, the following conditions, which continuously serve as the main pillars for this research, are now being discussed in the light of the updated aspects. Tracing back to the paper by Sabatier and Mazmanian, the five conditions compose a concise set of factors which mark the whole path along a problem statement towards its resolution by means of public action (Sabatier & Mazmanian, 1979).

2.1. CONDITION 1: THEORETICAL FOUNDATION OF POLICY

The condition comprises the program to be based upon a sound theory targeting changes in group behaviour related to the achievement of the desired end-state. Reflected upon the roots of local action, that is to say the policy making on the European level, one can state that the desired end state of clean air has initially been targeted through a cooperation of the EU and the automotive industry. The change in a group behaviour was intended to be accomplished by engines’ technological advancements towards fewer emissions from using fossil fuels (Čavoški, 2017). As such, one can argue the change in behaviour is intended to be reached by the purchase of a new car. But latest at the emergence of the Dieselgate, one must avert this anticipated road map. Instead, the local policies, which are composed to comply with the EU roadmap, now must bail out the aftermath of the automotive industry’s decisions of interpreting the emission tests differently than initially anticipated by the EU. Nonetheless, the air quality targets remain set and so does the regulative authority in the matter. Consequently, for still being able to meet the targets despite the additional emissions and mobility demands, the promotion of other mobility carriers is required within the local policies to meet the targets nevertheless. Indeed, the Dieselgate took place after the initial air policies were created. However, if now one is to evaluate the local policies, one might argue that the currently active legislations disregard available solutions else than the individual (new, supposingly cleaner) car. Indeed, this statement is perhaps a little far-fetched if the policies are not yet examined. Yet, to better grasp the working mechanisms inherent in the local policies, the work by Andries Hoogerwerf *Reconstructing Policy Theory* (1990) is used to better understand the connection between the policy targets and solution paths. This is important, since, if a public policy objective is not met, the reason for the non-accomplishment must be either found in the policy (theory) itself, or in its lack in implementation.

Notwithstanding, the work opens with the statement of assumptions being “the root of administrative action” (Hoogerwerf, 1990, p. 285). According to Hoogerwerf (1990), the total of assumption relations between the “objectives and means (final relations) and between causes and effects (causal relations)” compose a policy (Hoogerwerf, 1990, p. 286). Disentangling these, according to the relations between

the assumptions inherent in them, allows the reconstruction of the theoretical presuppositions a policy is built upon. Far from presenting themselves to the reader explicitly, these assumptions refer to the expectations, beliefs and values at its core and are related to each other. Consequently, a specific policy comprises assumptions that lead to identify a problem situation, such as poor air quality, which is formed by beliefs and values, such as that natural resources are to be preserved, their cleanliness contributes to human health, reduced costs in the future, etc. Further, these values and beliefs inform identified measures and targets, like human behaviour, socioeconomic practices or mere technological solutions. Identifying the set of assumptions, one can draw statements about assumption relations inherent in a policy handoff interests. Putting an emphasis on the preservation of the intended-to-be-cleaner-motorised, road transport within the local policies, thus may explain why the targets have not been yet achieved from a content related perspective. Because, if one traces to the assumption relations, a problem is unlikely to be resolved, if merely the problem outcome, but not a problem cause is targeted by the measures. Because, if one refers again to the assumption relations, one can chose between whether a problem outcome, or problem cause is being targeted by a measure. This gained perspective allows to critically assess the policies' solution capacities, or problem-solving probabilities, by the conclusiveness of the inherent structure of the policy. A lack of understanding the relations between assumptions of cause, means and effects leads to weak policy theories and therefore, represent a crucial reason for failure (Borrás & Edquist, 2013). Followingly, a policy describes an aspiration for achieving "certain goals using certain means in a certain sequence", in the sense of an "activity A will produce effect B" (Coenen & Lulofs, 2016; Hoogerwerf, 1990). Examining the policies' contents connects further to what Leeuw (2009) refers to as the black box 'problem', where the effects of intervention are usually examined, but limited "attention is paid to how and why those effects are produced". As a consequence, it might be put in question in the end of this thesis, why the objective of clean air is being targeted through purchases of new cars, even though these are proven to be the problem cause. Despite the Dieselgate, it is evident that burning fossil fuel creates the very substances targeted in the air policy. Conversely, one may argue that clean air and environmental preservation is better realised by a more substantial use of public transport, or cycling, rather than by a continuous and individual use of fossil fuels. However, the policy analysis according to their inherent relationships will indicate what kind of relationships dominate the policy designs.

Reflecting on the logic structures inherent in the air policies and the role of policy in the process of transition as conceptualised within MLP, one could draw the argument of local policy being the gatekeeper for different forms of mobility. As mentioned earlier, the policy as the regime, the gatekeeper for innovations. As the event of the Dieselgate and current target exceedances suggest, the substitution of the problem causer may did not take place yet, suggesting local policies not introducing the change, but fostering the status quo of polluting forms of transportation. In contrast, this situation might require short-term behavioural changes. These are deemed "crucial, if benefits of new technologies are to be fully realised", a display which is applicable in the current case (Chapman, 2007, p. 354; Vagnoni &

Moradi, 2018). Again, how the policies are going to be disentangled, can be read in the methods chapter. The important contribution from this heading is the theory. Based on assumption relations inherent in the policy, a pursued logic structure can be indicated. Moreover, the reflection on MLP and Hoogerwerf positions the policy theory as the main switch for change on the local level. As the policy is understood as the change regime, it moreover accommodates aspects from the broader transportation regime, such as influences from lock-in effects. As such, the policy is not freed from influences of the MLP-regime network.

2.2. CONDITION 2: TARGET GROUP COMPLIANCE WITH THE POLICY

The statute contains unambiguous policy directives and structures the implementation process so as to maximize the likelihood that target groups will perform as desired. The authors emphasise on the importance of the perception of a *common mission* along the affected actors (Sabatier & Mazmanian, 1979). Because an effective policy implementation requires both a sound theory and an agency for implementing the measures. Ideally, the connection between the target group compliance, the desired impacts and the assignment of the implementation to a supportive agency incorporates within valid technical theory, as discussed under the previous heading. In short, if it is desired to do something, tn it must be guaranteed that the desired state is in fact desired, and that the anticipated road map is feasible under available options. In this connection often mentioned are adequate financial resources. These must be available to the implementing agency, whilst hierarchically integrating the implementation process through minimizing veto points and incentives to overcome resistance. Moreover, formal decision rules shall be installed, while providing opportunities for outsiders to participate. Lastly, a frequent evaluation of the agency's performance by an external entity is advised (Sabatier & Mazmanian, 1979, p. 494).

Positioning this proposition against insights from the MLP, sometimes innovations do not make it to the broader markets, even though they are favoured by a substantial share of people (Schrape, 2014). Conclusively, one can state that the desired group compliances are more likely to happen the closer these are to the status quo. In different words, if a change is desired, then its accomplishment is more likely when realised by incremental steps of a supportive population. Therefore, it is important to keep an eye on the current situation, how it is, and how far an ideal situation would be away from the status quo. To finally address, how likely is it that individuals will behave as desired under expressed sets of rules? Referring again to the innovation perspective, one may ask, what do the people want? In terms of clean transportation, the following aspects can be transferred from MLP research onto the current subject. As such, the price, safety, time, and comfort of transportation are aspects to consider from a customer perspective. From a public perspective, the aspects of mode of transportation's public space use and general accessibility are moreover to be added in the concept.

In this connection, they are different forms of implementation which emerged since the 1970's. These should be briefly addressed here. In fact, the work by Sabatier and Mazmanian takes a classic top-down perspective, in which the desired end state results in tasks to be carried out by subordinate units (Sabatier

& Mazmanian, 1979). As such, these subordinate units have no say about the imposed rules. However, the academic world has added the bottom-up approach, hybrid forms of implementation (top-down and bottom-up combined), as well as collaborative forms of network governance (Geels et al., 2019). The bottom-up can be perchance best described as a movement by the people, for the people. Here, the desire to change comes from a collective thought and is realised by collective means. The hybrid forms merge aspects from both schools of thought, the network governance bears a similar line of thought, though does this concept put an emphasis on network participants in a concern. However, locating the current research objective in these schools of thought, one must allocate it in between all the mentioned concepts. In fact, carrying out a EU directive is a classic top-down approach. The higher ranked authority prescribes what to do. However, and speaking for the German case, also the bottom-up school of thought finds its place in the current objective. Every municipality has the legal authority to design own measures, to define to some extent, where the individual problem cause lies. Combined, it could be described as a hybrid form of policy implementation. Lastly, the variety of involved public agencies should be addressed. Perceived from this angle, the process could also be allocated in the realm of network governance. Several entities work together in order to master a common issue. But, what does this mean for the current research? This knowledge is important here, since it opens the different perspectives involved in the process. If a public is asked to behave a certain way, does the public generally support the policy objective of clean air? Is the public then willed to behave accordingly, given the confirmation of the policy objective? To emphasise the twist between regulator and the regulated: what if an individual does support the goal, but disregards a solution path which was established by public agencies? Indeed, Sabatier and Mazmanian reflect upon the relationship between the regulator and the regulated, too. But do more recent concepts highlight the importance of this relationship more empathically.

2.3. CONDITION 3: MANAGERIAL AND POLITICAL SKILL

The leaders of the implementing agencies possess substantial managerial and political skill and are committed to statutory goals. Again, the condition is likely to be fulfilled if a key legislator him- or herself identifies with the mission statement. The condition is further broken down:

Managerial skills, here presented as the ability to develop adequate control mechanisms for avoiding charges for fiscal mismanagement, managing to maintain a high morale amongst agency personnel, as well as balancing internal dissent in a fair manner. Political skills refer to the ability of developing good working relationships with sovereigns in the agency's subsystem. Moreover, it incorporates convincing opponent and target groups of being treated fairly/ equally, to mobilize support for the objectives, and to include mass media in the mission for reaching a positive coverage Combining these skills contributes to a persistent high morale amongst actors. Sometimes, so the authors claim, implementation processes fail because personnel becomes unmotivated, by for instance, fiscal mismanagement or poorly working relationships (Sabatier & Mazmanian, 1979). Vice versa, top implementing officials ought to be

supported by the personnel. Arriving, a sound commitment of personnel involved is a condition for effective implementation. However, advocating statements like these engenders, again, indeterminate expressions which are addressed in the following paragraph.

Again, to position the older concepts towards more recent streams in research, today the managerial and political skills might be phrased as the role of intermediaries or as the Network Administration organisation (NAO) (Provan & Kenis, 2008; Warbroek et al., 2018). One might say that for a successful implementation important is the availability of a 'fixer'. An individual equipped with skills to administer the process. It has been found how important these individuals are in the process of change (Warbroek et al., 2018). However, what also should be conceptualised is a corresponding decisive power to the mentioned skills. As such, the 'fixer's' position is weakened, if an ideal solution path is there, but not the decision power to enact policy accordingly. Again, these thoughts are closely related to the aspects mentioned in the prior heading.

2.4. CONDITION 4: SUPPORT ORGANISATION

The program is actively supported by organized constituency groups and by a few key legislators or their chief executive throughout the implementation process, with the courts being neutral or supportive. As new law can inherent a claim for behavioural change of a society, possible public resistance must be averted or altered towards support.

This item refers to the temporal dimension of implementation processes. According to the authors, implementation processes sometimes take 20 years to become fully effective. Like that, barriers of different natures can hamper the process, as the MLP emphasises, the process is of a non-linear nature.

However, for the implementation process to be successful, the 'stage light' position must be kept throughout the process in order to keep the support high. It was mentioned how resistance towards a policy can be present. This resistance has an easier play, once the intrinsic support declines. When reflecting upon the MLP, the time perspective and the role of courts as an external element influencing the process, one can reflect upon the landscape level (MLP). Again, the concept by Sabatier and Mazmanian suggest the presence of a 'fixer' once more. According to the authors, this person's job is to continuously assure the topic's public stage light position in order to keep support for the matter. If this position remains empty, the topic is likely to decline in importance and general support over time. The unwillingness to comply by other agencies or the decline in interest can be overcome, so the authors claim, by either the inclusion of appropriate incentives for a compliance, or a replacement of local implementors. Since the second is, in practice, seldom the case, the result is a greater sensitivity for local demands and, as a trade-off, a "suboptimal achievement of statutory objectives" (Sabatier & Mazmanian, 1979, p. 498). Again, if something is about to get done, one must be equipped with the political power, and also, the financial resources to provide appropriate incentives for a compliance.

2.5. CONDITION 5: CONTINUOUS IMPORTANCE/ RELEVANCE

The relative priority of statutory objectives is not significantly undermined over time by the emergence of conflicting public policies or by changes in relevant socioeconomic conditions that undermine the statute's "technical" theory or political support" (Sabatier & Mazmanian, 1979, pp. 484–485). As well is put in question by the authors to what extent a process can be still perceived as an implementation. As mentioned earlier, the accomplishment of policy targets may require several years, if not decades of process. In this time span, it is not only important to keep the political support for the policy on a high level, but also to stick to the policy objectives. It might be the case that, over the course of time, technological accomplishments undermine the initial statutory objectives or technological approaches to reach these. Another aspect is the concurrence of objectives stemming from different policies. Like that, it might be that one policy objective undermines another. Here, one can again see the time perspectives in the processes. However, in case of a competition between the policy objectives it is important to prioritise one policy over another. Again, it is up to key legislators to foresee such events and to include steps to assure lasting support for the policy. Again, and reflecting upon the previous headings, not only the skills, but also the decisive power plays a role in these steps.

The importance of a person equipped with skills and power lies on hand once more when reflecting the mixed concept back on the current case. When applying the chronological perspective onto the case a glitch between transitions and break through innovations appears. As pointed out by Moradi and Vagnoni, while applying the MLP on the Italian transport regime, transitions are long-term processes up to 50 years, whereas break-through innovations can become widely applied in under 10 years (Moradi & Vagnoni, 2018). Now one can fill these long-term processes and break-through innovations with the current situation in Germany. One might compare the long-term process as the primary path prior the Dieselgate, and the current need for solutions as the exceedance situations which display the main concern dealt with in this research. However, if one compares the time perspectives, the pressure on the 'public's shoulders' becomes visible: the original policy path including cleaner cars might be reasonable to be accomplished within 50 years, though are the possible dead-line extensions only possible for an amount of five years (BImSchG, 1974). Therefore, the current need for 'innovations' (=short-term solutions) is put reasonably under pressure, given the as double as long-time span as considered in average under the MLP. As such, time is the factor, but is it not only possible to 'remain important' over time, but also to coordinate action in a very limiting time frame.

2.6. SUMMARISING THE CONCEPT

Summarising can be stated that the five conditions as established by Sabatier and Mazmanian reflect in more recently published concepts, too. Thus, the concept remains the leading force with its five

conditions to be explored within this thesis. However, the perception of local policy as incarnating the transition regime presents additional thoughts, which did not exist within the implementation conditions per se. Beginning with the first condition, the reflection upon the contributions by Hoogerwerf (1990) allows not only to examine a policy's working mechanism, but also to examine the general solution path as intended by the EU on the air policy's emergence. The reflection on the MLP contributes the consideration of lock-in effects within the regime (regime here, as e.g. the transport regime as found in MLP) which additionally can explain motivations for selected policy paths. Moreover, the MLP relationship to innovations motivated the perception to understand public policy as well as a marketing decision. What do the people want, how can it be created, and how can the varying interests in the process be administered? The reflection on the MLP highlights these difficulties policies must face. The condition of people complying with the established rules is thus less likely to accomplished, if the policy objective is remote from the will of the regulated, as well, or the regulator. Moreover, the brief reflection on the existing, different forms of administration emphasises the difficulties to align varying interests with one another. This consideration of a policy being a trade-off between the regulator and the regulated did not gain much attention in the original concept of the five implementation conditions.

It has been argued in the introduction of this thesis how the process of clean ambient air is anticipated to be accomplished by cleaner transport, and how this was initially realised by a cooperation between the EU law makers and automotive industry. Stricter emission regulations in accordance with cleaner cars. Though, it furthermore has been presented how this incremental process failed and ultimately led to questionable local measures like driving bans for diesel powered vehicles. This as a root for the local policies, the glitch between the requests addressed to the local policy makers and undesirable needs for action are to be considered.

Having a clearer picture about what kind of regime aspects reflect in the implementation processes of locally created policies, one can indirectly state reasons why no other than the initial anticipated solution path of cleaner cars is unlikely to spin-off. So instead of identifying the regime which holds the power, this study explores how the transport regime, as defender of the status quo, unfolds in local air policies and its implementations. Like that, it indirectly becomes possible to argue what kind of measures, factors, or issues along the implementation path, as status quo aspects of the regime, refuse alternative solution paths towards clean ambient air. To put this approach against the MLP, one might perceive local policies not as the driving factor for the uptake of innovations towards a broader application, but as the gatekeeper to not let these alternative innovations to happen. This is important because, according to the perception pursued in this research, clean ambient air is hardly to combine with cars of which is known to be the main problem causer in the subject. How these dynamics as adopted from the MLP unfold in the policy can be read in the conceptualisation. To visualise the concept, the graphic below presents the conditions to be explored in this research:

2.7. VISUALISATION: THEORETICAL MODEL

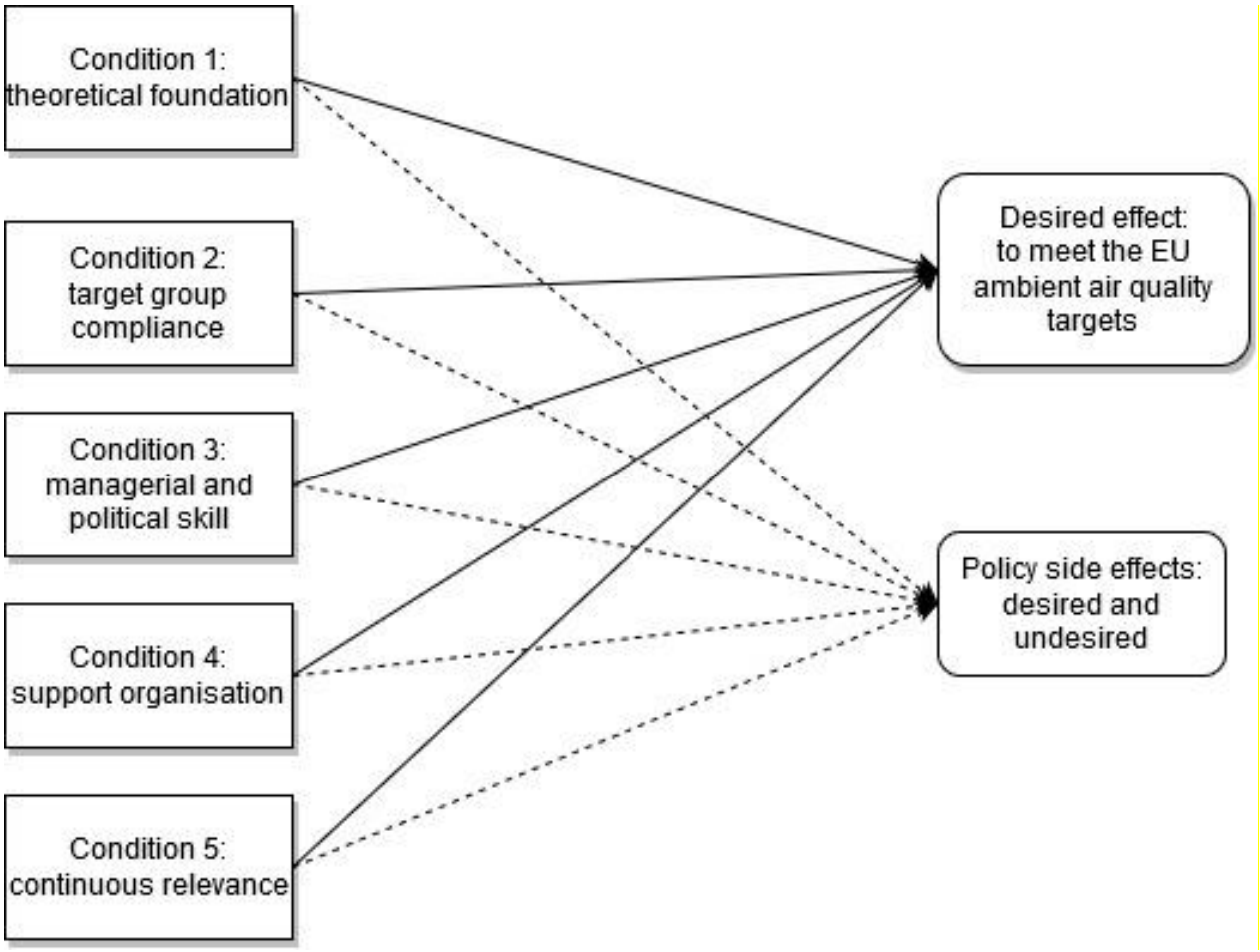

Figure 1: Theoretical model

3. METHODS OF DATA ANALYSIS

This chapter is going to explain the research methods applied in the following chapter to answer the research questions. In order to investigate the performance of municipalities in the implementation of European air quality targets by taking a closer look at the conditions for implementation, this research is designed as a qualitative, comparative small-n case study. Three respective German local policies are going to be selected for analysis. For doing so, the five conditions as discussed in the previous chapter are taken up to guide through the process from the methodological standpoint. The assumption relations that define a policy can be approached by means of different tools. Here, we build on two different methods. First, this research conducts a qualitative policy analysis following the theoretical focus presented above. Here, structured content analyses are conducted which are visualised in goal trees presenting the selected policies' approaches. This method is applied to individually disentangle the theories embedded in the documents. The comparison of these three policies addressing the same goals allows for a reflection and comparison of the policies' logical structuration. Like that, one can question the "validity of one's hypothesis" (Suchmann as cited in Hoogerwerf, 1990, p. 285). Second, expert interviews are conducted. Authorities in charge for policy implementation, as defined in the policy documents, were contacted to conduct a first round of interviews. Then, further agencies mentioned during the first round of interviews were contacted and subsequent interviews were conducted. This approach can be understood as a complementary approach to a larger body of research that evaluates the policies' effectiveness, measure outcome-to-regulation correlations, or collect and compare implementation steps without addressing *the reasons* for these particular paths chosen (Diegmann et al., 2014; Gysen et al., 2006; Wang et al., 2019; Weber et al., 2014). Hence, the approach of exploring the reasons behind several policies combined under a common policy target represents an understudied and "uncommon" approach taken up here (Weber et al., 2014, p. 1395). Since all three of the cases have not managed to comply with the EU targets to date, the comparison is less of an effectiveness evaluation in a classic sense. Measuring the extents of target accomplishment under certain policies would make only little sense. Instead, it is to be researched whether matters like shortcomings or contradictions can be found within the policies' underlying logic, leading to implementation mechanisms and potentially, ineffective instrument mixes.

However, for retrieving this picture, the interview stage puts a focal point on one case, to later transfer the insights from one case to the remaining cases to explore whether the gathered insights hold elsewhere, too. Ultimately, mismatches or overlaps between the actors' perceptions regarding the five implementation conditions from the assorted cases can be made visible, not only within one case, but across the examined cases. Interestingly, if an overlap between the cases can be found, it might be evaluated as a demand to the national level, since the cases locate in different counties of the federal republic.

The following sections are going to describe the case selection, as well as the applied data collection methods. Further, the method of data analysis is going to be presented and finally, the chapter is summarised by a brief reflection on the overall research design.

3.1. CASES

The cases for this research range from the Federal Republic of Germany. Known as a car enthusiastic society, Germany represents an insightful context since road transport is one of the main sources of pollution (European Environmental Agency (EEA), 2018). Moreover, the German legislative system is based on the principle of subsidiarity. Thus, varying perceptions and approaches towards the problem by local policy makers from different agencies, regions, and levels can be expected. If these variations are compared, managerial or regulative strengths and weaknesses can be identified, and applied in other cities. Selecting the cases for this study implies certain pitfalls, which require consideration. As Seawright and Gerring (2008) argue, the odds of choosing an appropriate sample, within a small-n study randomly, are simply not well. The factor which makes this research a small-n study, is the amount of available, and comparable towns. Because the compared cities ought to be "similar on all the measured independent variables, except the independent variable of interest" (Seawright & Gerring, 2008, p. 11). This comparison can be also referred to most-similar method. For researching the differences between local policies along the lines of defined categories, the cities of Hanover, Leipzig, and Essen have been selected for this research. The cities were chosen for their size, all having around 500.000 inhabitants (Deutscher Bundestag, 2017). German metropoles exceeding the 1 million inhabitant mark all do not accomplish the air quality targets. Besides, having a focus on larger towns with around 500.000 inhabitants is more representative for Germany than big metropoles exceeding 1 million citizens, given a majority of urban areas in Germany are larger towns rather than metropoles. Moreover, cities with a population of around 500.000 provide a greater variation in their degree of target accomplishment, suggesting differences in the local policies. In addition, we assume that alternative modes of transport, such as bicycles, are a more realistic alternative to choose from in cities of this scale. Compared to a one million inhabitant metropole, a bicycle may already fall of the list of possibilities due to greater distances. Another reason to include cities with a population of around a half-a-million from the sample are the sources of background emissions. As such, Duisburg would suit the above-mentioned criterion, but is a large inland port located in the city significantly contributing to the emissions. As a result, a comparison with a city without a harbour would therefore influence the results of comparison. Admittingly, a harbour is located in the city of Essen, too. Though, as can be read in the AAQP, the municipality has excluded the harbour from the policy scope, since the harbour is not as impactful in terms of emissions as other harbours located in similar administrative districts in this region (Bezirksregierung Düsseldorf, 2011, p. 156). Other criteria for selection are locally occurring characteristics. As one example, Stuttgart has been excluded because the town is located in a valley which significantly hampers existing efforts to increase air quality (Luftreinhalteplan Für Den

Regierungsbezirk Stuttgart Teilplan Landeshauptstadt Stuttgart, 2018). The altitudes of the cities are taken into consideration since weather and atmospheric events influence the measurements of pollution (Luftqualitätsplan Hannover, 2011). This is, for instance, a reason to exclude Nuremberg. The selected cities, Leipzig, Hanover and Essen, bare the same chances for reaching the targets. They are furthermore all subject to the same hierarchy of norms, which means that from a public service perspective, they have equal opportunities and obligations. They differ in the extents of success in policy implementation, which motivates a deeper analysis of the approaches that can be found in the respective policy documents. The selection of three cases allows for an in-depth qualitative analysis and comparison. The failure of many German urban areas to meet ambient air quality targets calls for generating insights into the conditions for these failures, so that air quality policies can be implemented more successfully in the future and thus, contributes to the decrease of health risks induced by poor air quality.

The unit of analysis comprises of the policy documents which are regulating the ambient air quality. As could be read above, the ambient air policies are created and implemented on the local level which turns local policies into our unit of analysis. The selected documents were published between 2009 and 2011. This variance in publication time can be explained by limited available data. While the time span in which local policies of air pollution control are published is larger, amendments on EU level and motions on the national level narrow the selected period as the setting for this research. One example here is the introduction of more progressive limit values, such as the inclusion of particulate matter (PM 2,5; PM 10) with a diameter of e.g. 2,5µm, by the EU in 2008. Therefore, a time span is chosen in which all emitters which are targeted today are already legally defined. Moreover, the selected policies are published before the Dieselgate fully emerged. Hence, it can be assumed that local policy makers created the measures largely independently from the national level since the distortion caused by the Dieselgate set in afterwards. Lastly, the chosen time span lies sufficiently in the past for the measures created to show effect.

3.2. DATA

The research draws on primary data, as gathered by the analysis of policy documents and expert interviews. As a logic consequence, the first bit of this data chapter refers to the policy content, whereas the second stream of data provides information about the procedural aspects of the policy implementation. To recall, if a desired policy target is not met, the error must be either found within the policy theory or within the implementation process of the theory.

3.2.1. Legal Documents

The analysis of the legal documents builds the core of the dataset. The ambient air quality plans (AAQP) represent the core legal documents valid on the local level. Followingly, AAQP from the municipalities of Essen, Hanover, and Leipzig are examined. However, these plans base on national legislation, which moreover translates the requirements embedded in the EU Directive. As a

consequence, the national and European legislations are referred to in the analysis chapter as well. These are, as the local counterparts, available to the public and published on the internet presences of the selected towns, or rather involved institutions. To begin with the EU Directive, the full title reads as *DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe.* The national legislation has adopted the policy targets to the national legislation. The legislation, which composes the direct legal basis for local actions on ambient air, divides into the federal immission protection act into law (BImSchG) and regulation (BImSchV) [Ger.: BImSchG: *Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge*; BImSchV: *39. Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes- Verordnung über Luftqualitätsstandards und Emissionshöchstmengen*]. Notwithstanding, the AAQP remain the analyses focal point and it is indicated when these above standing documents are referred to.

However, since each municipality creates its own plan, the patterns of updates and dates of publication differ from one another. As a result, the AAQP from Essen and Hanover stem from the year 2011, whereas the AAQP from Leipzig became effective in 2009. Another selection pattern was not possible, since the updated versions stem from, for instance, 2018 and can be expected to not have fully emerged yet (see also chapter 3.1). As other scholars emphasize, policies need several years to become fully effective (Matland, 1995; Sabatier & Mazmanian, 1979; Weible et al., 2011). Since the effectiveness of the applied measures is stressed in terms of selection choices, it would be inappropriate to examine policies introduced after 2015. As mentioned, due to the limited number of available towns matching the requirements, the selected time frame of 10, respectively 8 years, is the only possible setting under the current scope. Albeit the measure's effectiveness is not per se examined, their effectiveness and relation to problem cause are, nonetheless, discussed within the interviews. Like that, the focal point is indeed on this ten-year time period but are e.g. recent motions in the process possible to be considered and to be included in the result through the created research design.

3.2.2. Interview data

The body of data consists of audio-recorded interviews, conducted in the time period from October 2019 to January 2020. The interviews were conducted, and audio recorded in German language. Sections of importance for answering the research questions were translated and cited, if the participant agreed so via the informed consent. Interview protocols were written during the interviews. Further, the interview protocols were complemented while carefully listening to the recordings several times. The audio recorded files are stored locally and can be made available upon request, provided that the corresponding informed consent allows to do so.

The contact for the first interview was established with the accountable public servant whose task it is to establish the plan for the city of Hanover. The public servant in charge for the AAQP Hanover, is called Dirk Schmidt and works at the Environmental and Greenspace Department of Hanover, which

was indicated in the policy document of Hanover 2007, respectively 2011. The participant provides the consent to be named in person. After the first interview has been conducted, a snowball sampling, based on the first respondent's statements, was applied. The other actors involved in the process were mentioned by him, and these were then contacted accordingly. In addition, accountable partnering authorities were mentioned in the policy documents as well, and these were contacted too. After the first interview was conducted, a list of possible interview participants was established. Next to the snowball sampling as applied for the Hanover, both accountable (environmental) agencies from Essen and Leipzig are mentioned in the documents, too. These were contacted and interviews conducted with the respective public servants.

The respondents were contacted via either e-mail or telephone. In total, 14 actors were contacted of which 8 interviews could be conducted. The reasons to abstain from a participation were mentioned to be due to a lack of time, a perception of not being involved in the process (although indicated by other actors) or simply, no response. Finally, the response rate for the interviews locates at 57% (8/14).

Some agencies, despite the indication of others, did not see the relevance of their act in the subject. Here, the missing interviews may bias the existing data. This is taken into consideration and subject to careful interpretation. In order to collect the primary data, the question of: "why do you think the city does not meet the ambient air targets?" was posed to every interview participant involved in this research. This question is posed to cover aspects which potentially could have been forgotten in the concept of the five conditions. Next to this open question, a detailed interview guideline was used within the first interview. The guideline was used to 'dive' into the topic and orients at content- and process-related aspects of the established framework in a greater detail than the subsequent interviews. Questions addressing, for instance, a non-realisation of planned measures were posed to the 'broker of the policy', since this person is most likely to know of event like these. Notwithstanding, all interview questions are clustered according to the five implementations conditions. After the first interview has been conducted, the interview guideline was dismissed. Notwithstanding, each condition has been addressed within every interview thereafter, though not in form of closed questions, but open questions instead. In this sense, it might be understood as a second guideline in less detail, yet compelling of the same five conditions as explored before. The interview guideline can be found in the appendix.

3.3. CONCEPTUALISATION

This chapter is going to connect the research methods with the established concept. To recall, this research follows a two-fold approach. The first half, referring to the secondary data of local air policy, as perceived as the policy content, is going to conceptualise the policy analyses, whereas the latter connects the primary data as collected by expert interviews with the remaining implementation conditions, exploring the procedural aspects surrounding the policies.

3.3.1. Conceptualisation: Policy analyses

This subsection is going to conceptualise the policy analyses. In order answer the sub-research question 1, investigating the policies' quality by indicating and comparing the approaches towards the policy problem, several necessary steps are now presented. As mentioned, the total of assumption relations build the root of a policy (Hoogerwerf, 1990). Therefore, these city specific relations are extracted from the documents. To begin with, the problem statements are extracted from the local ambient air policies. Each public action is based on an intention, and therefore, examining what the problem is in the specific cases, essential. Once a problem is indicated, the public action is channelled through measures which ought to resolve the problem. Therefore, as a second step, the measures embedded in the documents are collected and clustered according to their intended impact fields (targeting different sources of pollution). Here, the differentiation between the final- and causal relations sets in. What is done to resolve the problem, being the final relation, and how the measures' impact relates to the problem cause, being the causal relation, is being differentiated. A measure might be effective in terms of resolving a problem outcome but compared to a measure, which combats a problem cause, the effectiveness can be put in question considering a measure's efficiency. Therefore, the allocation of measures' direct and indirect relations to the problem causes established. As already indicated in the prior chapters, the problem causes dealt with in this research are likely to be related to transportation. Therefore, the focus will be placed at these measures relating to traffic akin causes. Indeed, it has been indicated in the prior chapters, what kind of issues must be faced when controlling environmental problems. The quantity of measures, whether these are designed in a direct or indirect manner, allows no conclusion about a policy's effectiveness. Though, do all examined policies exceed the air quality targets. This fact once more motivates the step to stress the policies' quality within the analyses. In other words, this part of the conceptualisation clarifies the documents' quality in terms of selected approaches, to be then confronted to the actors in charge in a second step. This is an important aspect to mention, given the methodological suggestion of ascertaining a policy's quality by comparative literature reviews (Hoogerwerf, 1990).

Moreover, for presenting the assumption relations, goal trees are established to visualise the envisaged solution paths. However, some issues mentioned before, regarding the clarity of the subsequent policy mix representations, are to be taken into consideration once more. As an example, synergy effects are intended to be reached by a set of, for instance, 40 measures. This amount, in turn, hampers a lucid and explicit display of goal trees to some extent. For combatting this issue, each of the policies' measures are clustered and listed as numbers. Hence, one can find the goal trees' contents in the corresponding lists of measures. The goal trees compose as follows: the top row represents the ultimate goals. The intermediate policy goals are presented in the second row, whereas the remaining rows collect the measures respectively. In short, the ultimate goals are located on the top, intermediate goals below, the remaining rows and columns represent the clustered measures. These can be found in the appendix. For structuring the results from the policy analyses, the commonalities and differences are

discussed within the results chapter. This has the advantage to demonstrate the varying or overlapping characteristics of the policies which are, in theory, created in accordance with case specific characteristics. Moreover, a reflection on each measure would go beyond the scope of available resources for this research. Again, the policy analyses' intention is not to evaluate, for instance, the impacts, but to gather insights about the general approach by the mechanisms' quality for having a necessary overview for the expert interviews. These are conceptualised within the following subchapter.

3.3.2. Interview conceptualisation

This section is going to conceptualise the expert interviews. The reader might understand the approach best if the idea of this study is outlined: the investigation explores how the implementation conditions, from theory creation to application, are perceived by the actors in charge, the administrative body behind the political representation. Note, the political camp has been discharged from the primary data collection. The investigated policy documents are already behind the stage of a political decision making, the vote which adopts the policies. This point marks the only direct contact with the political parties in the matter. Therefore, the focus is at the personnel from the administrative bodies accountable for the idea collection, the creation, and the compliance of implementation. The word exploration already indicates the open character of this research. A small-n approach is selected, and hence, the given answers according to each condition still within a scope, in which the answers can be dealt with, individually. Like that, each opinion can be presented in a qualitative manner in relation to each condition. In case respondents' perceptions vary regarding one condition, all collected standpoints are presented respectively. Ultimately, by collecting the perceptions for each condition, the complete set of conditions creates the overall 'picture' for one municipality not yet accomplishing all the targets. As indicated earlier, this compiled 'picture', that is to say, the arguments brought forward for the non-compliance, is then used as a basis for the reaming cases, or rather, for the interviews with the remaining two key officials.

The landscape dynamics indicated within discussion in the theory chapter as adopted from the MLP remain to be conceptualised. In contrast to the cited study, this research does not seek possible promotions for alternative solution paths but examines existing policy choices to confront these with lock-in factors of the fuel-based transport regime as indicated by the MLP. Therefore, the aspects which are found to externally 'lock-in', "forces that stabilize current dominant regimes", are now listed (Moradi & Vagnoni, 2018, p. 240). After the German cases have been investigated by the above described steps, it is explored whether the lock-in factors resonate in the primary data as well. Therefore, these lock-in forces from the regime landscape, as collected by Moradi and Vagnoni in expert interviews (2018), are simply listed at this point (Moradi & Vagnoni, 2018, p. 237):

- Land use and urban structure
- Resistance of decision makers

• Open and general goals and regulations for clean mobility

• Increasing demand for mobility

• Resources and infrastructure

• Funds for infrastructure development

• Technological strengths

However, the possible resonance of these factors has no valid explanatory power. The comparison merely explores a possible connection between the countries and shall be objective to future research.

3.4. Summary Research Design

In summary, this chapter transfers the theoretical concept into applicable research methods. Hence, a comparative small-n case study is being conducted. Three respective German municipalities, namely Essen, Leipzig, and Hanover, are selected which are going to be examined by qualitative policy analyses. The results of these analyses are then used as a basis for expert interviews. These experts, either working for public agencies or in private agencies directly connected with the policies' endeavours are either mentioned in the policy itself or indicated via a snowball sampling. However, due to limitation, the snowball sampling is merely applied in one case. Notwithstanding, the collected perceptions regarding the five implementation conditions are then juxtaposed with the remaining actors. Moreover, to connect the 'insulated policy perspective', as designed in the theory chapter, the findings are reflected upon the landscape factors as indicated above.

4. Results: Analysis – Assumption relations

The results from policy analyses are presented in this chapter. Consequently, each of the cities' measure catalogues from the corresponding time period are analysed according to what is perceived as the problem, what is assumed to be the cause of the problem, and what is assumed to be effective and efficient against both, problem outcome and problem cause. The complete documentation of the analyses, including additional remarks and explanations, measures listings, assumption relations, and (goal trees) can be found in the appendix A. Note, the national legislation and its local counterparts address emissions stemming from the industry as well. However, since it is evident that the traffic sector accounts for the problem situation faced by local policy makers to the largest part, the other areas regulated by the ambient air policies are left out from the discussion. Hereafter, the traffic sector, and not the industry sector, present the narrative in this work.

4.1. Ambient Air Quality Plans: Commonalities and Differences

As mentioned, this chapter summarises the analyses' findings as can be found in the appendix. Since the documents span a large number of measures, the essential approaches coping the objectives are presented here. For retrieving the picture, which is brought forward to the involved actors, the documents' commonalities and differences are now presented.

Commonalities

Before the differences as found within the data are presented, a display of commonalities is presented to better grasp a problem basis for the sample's then varying approaches or assumptions. Having that said, the analyses regarding the cause of emission in the respective cities results in an overlap. Though, the established cluster of emission according to their sources is suggested by national legislation by §§ 27 and 34 BImSchV. As such, the main source of pollution is found to be motorised road traffic with a respective share of 67% (Essen) 70% (Hanover), and 72,3% (Leipzig) of NO_X is caused by road traffic in the all examined cases. Albeit different in extents, the common feature is the road traffic as the main cause for the policy problem. The rest accounts to factors such as the industry, agriculture, and other sources. However, it again indicates the importance to consider the motorised urban traffic within the process. Moreover, it becomes apparent that the major exceedances are to be found in urban hot spots, which further justified the shift of regulatory competence toward the local level.

1. Common traffic measures

Other similarities can be stated to be the existence of the common traffic related measures. These, again, can be explained by national influences from different sources. The national legislation which conditions not only the basic steps to execute for the policy making process, but moreover the measures' design frameworks is likely most important in respect to the similarities between the documents.[2] According to the paragraphs which contain the measures' conditioning (§ 27 BImSchV in connection with § 47 BImSchG), the polluter-pays principle must be considered in the measure design. Consequently, the municipalities are equipped with the legal authority to cut off traffic, since it is the major contribution to the problem at hand. Subsequent, local impacts from national legislation are found which are absorbed by the principle's application: As such, national roads and highways leading into the city display an additional burden to be coped with, as the problem statements reveal. In this sense, the complete sample has installed driving bans to filter the traffic coming from national roads towards the city. Addressing trucks, large vehicles exceeding 3.5 tons are guided around urban areas to prevent congestion and pollution. Having such measures installed across the sample is hence a common feature. However, the need for such mechanisms already presents a burden caused by national legislation in itself. In this sense, that national legislation does not regulate traffic amounts to an extent that it would

[2] These common steps refer to a guideline phrasing required steps for measurement, measure creation, respective to the sources and pollution areas.

not display a threat to clean air on the local level. Note, national roads fall into the liability of the county, or rather national administration and can therefore, be perceived as conflicting policy. On the other hand, the presence of traffic lights' priority switching for public transport and traffic flow optimisation software which is supported through a national funding programme again indicate a national level accompaniment in the process.

2. Incentives to abstain from owning a car

Other similarities can be found in the realm of measures motivating the use of alternatives over the individual car. The use of the individual car is commonly expressed as one core issue to be addressed within the examined policies. In order to combat this situation, every case refers to the use of alternative means of transport and has installed measures creating incentives to abstain from the individual car accordingly. Because ultimately, if someone decides to use a car or not is also a decision of costs. And here, the term cost is intentionally left broad. This cost can be controlled and adjusted by a policy. One way of doing so, is by adjusting economic costs in terms of tolls or tax reliefs. The expressed intention to progress the economical exploitation of parking spaces must be addressed regarding all cases. Unsurprisingly, the local policies have, in theory, the legal authority to install such instruments. As presented in the introduction of this thesis, additional instruments could be an entry fee or road tolls. However, besides the economical exploitation of parking spaces, no other financial burden is created to abstain from fossil fuel mobility. Vice versa, no reward for choosing else than the individual car is present within the cases. Notwithstanding, incentives for sustainable mobility are embedded in every policy examined for this research. How these factors, whether they appear as additional parking costs or by incentives to use the bike unfold within the implementation can be read in the subsequent chapters.

3. Environmental Zone (EZ)

Moreover, Environmental Zones constructing the regulative area for entry restrictions (as well as bans) are present within the complete sample. According to the narrative of welcoming problem cause oriented measures, the environmental zones present such an example. Though, despite the entry regulation in form of EZ, the quality can be put in question regardless, since the policy targets are not met. However, the commonality of the cases refers here to the entry badges required for the EZ. Like that, a collaboration between the local and national level is again retrievable. Moreover, it is stated in the AAQP Hannover (2011), how the zone only has a limited effect on emission reduction, but is rather perceived as a symbolic measure instead. Nonetheless, the EZ displays the most direct, causal relation between a problem cause and means to resolve the problem.

4. Division of Emission and Immission

Another common aspect is the afore mentioned division between pollution avoidance and impact decrease. The division of pollution into the groups of immission and emission is an influence by national legislation, and vastly adopted within the sample. Measures dividing pollution according to impact

decrease and avoidance are installed, whereas a focus is rather put on impact decrease, than on the avoidance of pollution creation. Here, the afore discussed quality statement regarding causal and final relation comes back. Indeed, the number of measures does not say anything about the combined effects. However, it becomes apparent that the only measures which are taking the polluter-pays principle directly into account, the truck guiding system and Environmental Zones, locate in a direct connection to a national (regulative) dependency. In this connection, measures to replace the public vehicle fleet with electronic vehicles, which can be also perceived as a polluter-pays principle measures, are again supported by national funds. As such, the stated concern from AAQP Hanover, 2007 of local designs leading to substantial different regulations and thus confusion amongst citizens, can be averted[3]. If one kind of car/engine is not allowed to enter an Environmental Zone within a city, these regulations apply national wide.

Summarising, one can state that the examined plans do overlap in the factor accounting most importantly for the problem situation, motorised car traffic (resulting in NO_x exceedances). Another common feature: the only measures taking the polluter-pays-principle into account display not a direct output of local policy making but present a legislative act of collaboration between the national and the local level. The lack of commitment for the polluter pays principle moreover reflects in the remaining, from the national level independent, measures. These account for the problem outcome, rather than for the problem cause. Indeed, the amount of measures have no explanatory power regarding the effectiveness. However, it became visible that no major measure curtailing the use of private cars is enacted independently from national legislation or support, albeit legally advised.

Differences

Having gathered an overview of the policies' commonalities, the major differences gained through the analysis are now presented.

1. *Administrative structure*

Beginning again with the administrative structure behind the regulations, the city of Essen displays an outlier. Contrary to the other two municipalities, the city of Essen is administered by the regional administration of Düsseldorf. This administrative region envelopes, next to Essen, also the cities of Duisburg, Oberhausen, and Mühlheim an der Ruhr (Bezirksregierung Düsseldorf, 2011). Having such a division of authority decorates Essen as the point of observation with the biggest distance between regulator and the regulated. However, taken as such, this relation has no explanatory power. It is to be examined in the second half of the analysis whether this characteristic resonates in regulative actions. It

[3] It was found in AAQP Hanover (2007), which remains the basis for the version of 2011, that the decision to shift the competence from the county to the local level was to be "in principle wrong" and concerns regarding diverging regulations across the county expressed (Luftreinhalte- Aktionsplan Hannover, 2007, p. 4).

merely shall indicate the presence of this distance, as an initiation for the exploration of condition 2, in which the target group compliance is targeted.

2. Level of ambition

Comparing the cases, Leipzig can be stated to be city with the most differentiated AAQP. Again, this comparison builds the basis for the subsequent interview section and does not seek to evaluate the effectiveness according to the policy designs. This being said, the most salient characteristics are the self-proclaimed sustainability targets guiding the measures' design stage and the mayor's mission support statement in the introduction of the policy. As such, one can differentiate between a mayor's mission support as found in the ambient air policy of Leipzig, and a policy's opening statement questioning the responsibility as found in Hanover. Moreover, the self-proclaimed targets predict a code of conduct for every public action in Leipzig. For the matter committed statutory goals like these could not be found within the remaining sample. Another positive item in the approach pursued within AAQP Leipzig 2009 is the mission statement of having a (private) car-free inner city. The mission statement is therefore worth mentioning since it goes beyond the sole mission statement of clean air, by connecting the major polluter with the initial objective and the aspect of a growing city. Like that, fewer loopholes preventing the decrease of car traffic are given. Again, referring to the lengthy time frames of implementation processes, no actual measure, which for instance, closes inner city roads for motorised vehicles has been expressed at the time. However, the mentioned loopholes, which could be also described as the perseveration of the car regime, reflects as well in the preservation of spatial allocation (§47 (3) BImSchG: "the goal of spatial allocation ought to be preserved" [own translation]) of urban spaces. The paragraph commits to the design of public spaces, whereas the spatial allocation for committed uses are to be preserved. In different words, closing a road for automobiles, this paragraph displays a barrier, since a step like that would require a reconfiguration of the use for public space. Notwithstanding, and aligning with the car-free-mission, the spatial allocation is only targeted and reconfigured in Leipzig. It is stated in the policy that the city administration acknowledges and welcomes the aspect of Leipzig as a growing place, inevitably requiring the re-adjustment of urban spaces towards a more equal distribution according to all traffic participants. Like that, cars' prominent position in public spaces is lifted, which cannot be stated about the other examined policies. As well, referring merely to the AAQP, Leipzig presents the most extensive citizen participation process for collecting measure ideas and evaluates each (public) suggestion in detail. Indeed, this aspect might be allocated under the procedural elements. However, the process' results are embedded in the examined policy document already. Hence, the participation process' results can be also perceived as a content-related item. Another extent of commitment, as well not retrievable from the other cities, is the measure of using 10% of annual budgets for renovating and expanding the pedestrian and cycle traffic. Compared to Hanover, where measures for the promotion of cycling result in single shot applications, one can tell a difference in commitment to alternative means of transport.

3. Compliance mechanisms

Not testable due to a lack of empirical data, although noticeable, is a lack of implementation and compliance mechanisms in the AAQP Essen (2011). As such, measures are promoted, but at times, no statement referring to a time- frame or implementation frame is indicated in the policy theory. As one example, local measure #13 promotes lectures to public servants for an environmentally friendly driving attitude, but is it not stated how long the campaign will last, besides that a participation is on a voluntarily basis.

Lastly, solely the city of Leipzig takes driving bans for separate vehicle types into *consideration* within their policies prior to the Dieselgate. Although intended as a means of last resort for extreme circumstances, Leipzig is the only case in which these kinds of measures are taken into consideration.

4.1.1. Intermediate results

Finally, one can state that after analysing the contents from the observation, the ambient air quality plans are more alike, than different to one another. Again, the designs do not tell anything about the measures' effectiveness, though are important insights regarding the respective quality of the AAQP for the interview stage retrieved. Considering the polluter-pays principle, which is embedded in the national law and basic principle for the AAQP, little to no action is done purely on the local scale to account for this principle. Instead, the (indirect) strategies of diminishing the pollution impacts resemble and present the fields of largest public efforts. Though, measures like planting trees along polluted roads, single-shot promotion campaigns for using alternative means of transport, lowering the driving speed from 50- to 40 km/h on some roads, or trainings for environmentally friendly car driving attitude targeting public servants, in combination with target exceedances almost a decade after the adoptions allows to question the selected solution paths within the second stage of this research. To, again, phrase it with Suchmann: "one is akin to question the validity of one's hypothesis", involving the concern whether these measures indeed produce the desired effects (Suchmann as cited in Hoogerwerf, 1990, p. 285). Nonetheless, accomplishments were reached under these plans, too. Hence, the questioned hypotheses are valid in respect to some targeted pollutant. As such, the PM-10 and PM-2.5 problem could be resolved by the examined set of policies. However, the problem is not completely resolved here, since the emergence of the Dieselgate and the motivation for this research indicate. Moreover, the applied scenarios in the measure creation are based upon outdated figures. In reality it shows how the traffic load increase more than the scenarios anticipated. Hence, without the Dieselgate, the measures are likely not capable of reaching the desired effect. Therefore, from a EU perspective, no compliance with the EU directive established. Leaving the question of quality in terms of problem cause oriented measures (causal relationships) aside, it must be further noted that measures addressing the impacts of pollution are coherent across the cases. As an example, trees are capable of intercepting pollution. However, this strength weakens once the picture is broadened towards the actual problem cause. Here, the logic structure presented above can be reasonably stressed. Nonetheless, the extents to which is problem is

acknowledged and communicated differs within the policies. Yet, how these differences in commitment finally result in different measures, and ultimately relate to the desired end state, cannot be stated here. Though, what will be addressed in the next step are the reasons for these, to the cause, indirect approaches.

4.2. Implementation Conditions: Perceptions in Hanover

The chapter presents the actors' perceptions as collected in the interviews conducted in Hanover, Germany. The theoretical model and its visualisation are taken up again to structure the collected answers accordingly. Subsequently, the conditions for an effective implementation are dealt with individually. The interview participants' relationships to one another are briefly introduced at this point. Starting with the EGDH, the environmental agency of Hanover. This agency is the policy's broker. As such, there is a horizontal hierarchy present, since the EGDH opposes a task to other, for specific tasks accountable local agencies. One of those is the DPUDH, the Department for Planning and Urban Development. The department's authority is to plan e.g. the construction of measures designed by other agencies. Perceived from the task's perspective, this agency is the hierarchy's low-end. Different to this is, for instance, the traffic agency. The traffic agency receives e.g. a commission to alter a street from the EGDH, but has the agency its own leeway in the responsibility to design and implement the measure together with the civil engineering agency. However, neither of these two agencies was available upon request. This can be stated regarding the horizontal hierarchy. A task is divided amongst the agencies, and respective the specific task, the responsibility spreads accordingly amongst the actors. This final allocation, in turn, limits the EGDH influence. On the other axis, the RME, the Regional Ministry of the Environment must be mentioned. In the matter of clean air measures, specific dependencies, or hierarchies may appear vertically. As one example, the EGDH would need the support from a county-level agency if, for instance, new road signs are to be introduced. This is the case, since road signing is a matter or county affairs. However, how these hierarchies account in the implementation process can be read below.

1- Theory: To recall, this paragraph addresses the afore raised argument of the policy's debateable quality. The installed policy (Hanover) is in force for 8 years to date, yet the EU targets could not have been fully realised. As presented in the previous chapter, the measures are mostly indirect (emission vs. immission) and hence, and assuming a correct implementation at this point, unlikely to collectively alter the problem cause of motorised, individual road traffic. Indeed, the appointed effects a measure has on the pollution extents are considered within the policy. Though, these are not tackled in the most direct way possible, which is also acknowledged by the key legislator, Dirk Schmidt (EGDH, personal communication, October 23rd, 2019). On the account's positive side, according to the respondent, traffic related measures do have pollutant specific purposes (EGDH, personal communication, October 23rd, 2019). One example for the instrument mixes' effectiveness can be named to be the target accomplishment for PM 10 and PM 2.5 particles, which no longer display a problem to the policy

makers. Here, according to Dirk Schmidt (Environmental and Greenspace Department of Hanover; EGDH) and the Regional Ministry of Environment (RME), measures such as trees along polluted roads and updated, absorbing tarmac positively influenced the goal achievement in regard of particle matter (EGDH, personal communication, October 23rd, 2019; RME, personal communication, November 7th, 2019).

Another positive aspect, as well in relation to particulate matter, is the introduction of the Environmental Zone (EZ). The EZ bares the advantage that certain polluter groups are clearly identified and excluded from the area. However, according to Dirk Schmidt (2019), future traffic loads and emission extents were calculated in scenarios, of which non foresaw the actual increase in the traffic load and events such as the Dieselgate (EGDH, personal communication, October 23rd, 2019). Moreover, according to Diegmann and AAQP of Hanover 2011, the Environmental Zone has only a limited effect in pollution decrease and is of symbolic nature, given the instalment insignificant impacts (Diegmann et al., 2014; Luftqualitätsplan Hannover, 2011). In short, under current and future circumstances, the EZ is giving away potential to lower the hazardous impacts by current entry regulations. Despite, this measure displays the most significant hurdle in connection with the polluter pays principle. Other aspects in relation to the EZ are discussed in the subsequent chapters.

Again, the number of direct vs. indirect measures towards a problem cause has no explanatory power. Though, it can be questioned why the polluter pays principle was not applied more profoundly. It has various reasons, as became apparent during the interviews: sheer traffic loads, lack of alternatives, and lack of political ambition, that is to say, a lack of a political majority for traffic curtailing measures (EGDH, personal communication, October 23rd, 2019). The traffic loads are partially due to national intake roads leading into the city. In order to avoid a traffic collapse, measures of limiting the amount of street lanes is simply not realistic. In fact, according to Dirk Schmidt, it would be indeed the most logic measure to cut the traffic, but would short time aftereffects of such measures surpass the appropriateness (EGDH, personal communication, October 23rd, 2019). At this point, the feasibility of such steps was not further elaborated, since it is just claimed to be impossible. Reasons for not doing so were further stated to be the displacement of traffic, and like that, the displacement of the problem to another area. In this connection is then the measures' required proof of effectiveness, which is difficult to establish, given the afore mentioned aftereffects resulting from a prohibition traffic for certain roads or areas (DPUDH, personal communication, November 18th, 2019). Notwithstanding these claims, another short time aftereffect relates to the lack of alternatives for the car. The lack of alternatives is a central element in the non-compliances according to the interview participants. Here, the elements of transportation come into play. In all three pillars, the car has, in relation to the current infrastructure, a dominant position. Traffic, mobility, and access are the elements of traffic. Regarding traffic, when compared to available alternatives in the city of Hanover, the mileage and speed ratio is best with cars in the Region of Hanover. Reflecting on mobility, also referred to as the transportation of goods, compared at the price and comfort points, there is no alternative for the car (BIU, personal

communication, November 26th, 2019). Lastly, the element of accessibility might be best presented by the perception from a public servant from the regional environmental agency. The respondent comes no longer by bike to work, but with his own car. Since the respondent moved to Hanover's region, the public transport schedules and cycling distances no longer would be reasonable to deal with, according to the respondent (RME, personal communication, November 7th, 2019). In short, the regulative authorities, as well as interview participants from environmental protection unions agree on the benefits a car has to offer, and connected lack of alternative for the individual mode of transportation. Moreover, due to the spatial structure of Hanover and its Region, public transport solutions are difficult to be realised since the region assembles of a variety of remote villages. Therefore, the individual mobility paired with the possibility to transport goods is a factor for which simply no adequate solution is yet available. How this lack of alternatives, or dependence on the individual car, is further fostered, can be read in the subchapter committing to regional policies. Speaking of a lack of alternatives is perhaps a bit too ambitious in this regard. In fact, the AAQP itself promotes the use of available alternatives. In fact, for bypassing the use of a car, no new innovations are required. Public transport, bicycling, pedestrian traffic, and a city of short distances are promoted within the policy. Interestingly, the same individuals, who are accountable for the plan, state a lack of alternatives, although these alternatives are promoted in *their* plan.

Despite the promotion, no cost advantages for the use of these alternatives are created within the AAQP Hanover (2007 & 2011). Merely an increase in attractiveness of public transport and bicycling is anticipated within the legal documents. Regarding cycling in the city, the accountable person from the RME stated that cycling within the city would be an act of crime, referring to the weak position of cycling in the overall traffic space (which suggests to break the rules in order to get forward in traffic. Note, actions to alter this situation lie within the participant's wider field of competence of environmental matters) (RME, personal communication, November 7th, 2019). The decision to promote the use of alternatives instead of applying a cost-benefit analysis has, according to for the AAQP Hanover (2011) accountable person, political reasons. A political manifesto dedicating to sustainable transport and mobility solutions is missing, according to Dirk Schmidt (EGDH). It has been indicated before, but would a model installed like in Leipzig be favoured by the plan designer, but would it be a "political suicide" to opt for such a measure in a region "in which every person knows someone working for Volkswagen" (EGDH, personal communication, October 23rd, 2019; BIU, personal communication, November 26th, 2019). Every other interview participant from Hanover, did acknowledge the benefits connected with cars, albeit its environmental impacts (EGDH, RME, BIU, VCD, DPUDH). In this connection, it was referred to the EZ again. Albeit its limited effectiveness, especially under the yearly increasing number of cars in the region and the Dieselgate, the zone is politically an important symbol (EGDH, personal communication, October 23rd). As a result, a measure promoting clean air has been installed, car drivers experience negligible restrictions but is something good for the environment done, without doing something significantly about the actual probelm. Eventually, the political leaders can

state: “we did something good in the right direction” (EGDH, personal communication, October 23rd, 2019; BIU, personal communication, November 26th, 2019; VCD, personal communication, December 19th, 2019).

This can be said about the relationship between problem cause, and problems connected to install measures which account for the origins in a more direct fashion. Something is done, it should be done more, but the use of available alternatives would require a prohibition of the current use of the car. To emphasise the burden such public action would face, a statement by Dirk Schmidt (EGDH) exemplifies the situation: within the debate of the traffic light’s priority switching for public transport, a red light for car drivers was already perceived as a prohibition. The notion of a green wave throughout a city being simply impossible, due to the urban infrastructure (crossings), remained unnoticed. In essence: someone (a politician) is better advised to not curtail the individual freedom of cars (EGDH, personal communication, October 23rd, 2019). Summarising can be said, the key legislator is well aware of the limited efficiency. Dirk Schmidt brought forward an example emphasising his understanding: If one would spray the targeted pollutant in someone’s face with a spray bottle, it would display a grievous bodily harm. If that is done by a car, it is socially accepted. Hence, the current policy represents the maximum curtailment possible under the, by then, political setting. Referring to the condition fulfilment, a partial accomplishment can be evaluated.

2- Target group compliance – and sub-classifications

To recall, this section summarises the findings regarding the measures’ effectiveness in changing the target group’s behaviour. It is further to be explored whether a *common mission* respective the goals and steps of implementation is perceived amongst the involved actors. Note, in a German context, this point is of special importance, since the tasks are divided amongst several public agencies. Here, some agencies indicated to be important in the implementation processby Dirk Schmidt, did either not reply, or was an involvement in the process stated to be non-important within the sent-out interview requests. Therefore, statements relating to these agencies are subject to interpretation.

2.1 - The objectives are clear amongst implementing agencies: The examined policy, including the goals (Preservation and enhancement of mobility while decreasing environmental impacts and a decrease of emissions from remaining motor vehicles), needs to pass the city council’s vote. In that sense, a majority must have consented the aspired solution path, meaning the set goals and steps of implementation, since the policy is in force. However, the interviews reveal that the policy objectives (goals and intermediate goals) are indeed consistent but is there (at times) no agreement of how a measure should be designed and implemented amongst the implementing agencies. Here, the afore describes hierarchies in horizontal and vertical direction set in. The combination of an agency’s leeway within the measure creation and different perceptions of the desired end state amongst the implementing agencies creates conflict areas damaging a measures’ effectiveness. For presenting how this conflict results in actions, examples regarding cycling traffic and street planning efforts within the city can be

raised: According to BIU and EGDH, the traffic agency (accountable for street planning) favours the car as a means of transport, and like that, supports the status quo of a dominant car in urban (road) spaces (EGDH, personal communication, October 23rd, 2019; BIU, personal communication, November 26th, 2019). In case road sections are being reconfigured in the realm of air quality, limited attention is paid to cyclist, albeit cycling displays one element in the intermediate goals (Landeshauptstadt Hannover, 2011; VCD, personal communication, December 19th, 2019). After a redesign of by the plan affected road sections, cycle paths were replaced from the sidewalks onto the roadway. Moreover, a cycle path within the updated design fills a complete road width towards inner-city crossings. According to VCD, it was not clear why the decision of taking cyclist onto the road was made on county level, although it should be evident that this decision may decrease the traffic safety (VCD, personal communication, December 19th, 2019). Therefore, the measure of redesigning the cycle paths could also be referred to as a rival factor of county policy. However, according to BIU, the traffic agency of Lower Saxony, which is accountable in the manner, but was not available upon an interview request, makes use of *outdated* studies to continuously justify the 'autogerechte' city (BIU, personal communication, November 26th, 2019).[4] Referring to §47 (4) BImSchV, measures falling into the realm of traffic regulation must be established in accordance with the traffic agency. Therefore, the act by the traffic agency is indeed legally required, though can the very design be put in question due to these risky decisions. Here, one can again refer to the varying interpretations of the preservation of spatial allocation (§47 (3) BImSchG: "the goal of spatial allocation ought to be preserved" [own translation]) of urban spaces. As a consequence, one can state that the goals of spatial allocation in traffic areas is perceived differently amongst the involved actors. A one consequence of this variation, the decision to replace cycle paths has led to the effect of cyclists being relocated into the blind spots of truck drivers, resulting in several cycling fatalities in Hanover (VCD, personal communication, December 19th, 2019). The examples for fuzzy implementations is not ladled out: a measure which intends to optimise the traffic flow by a transformation of a roundabout into a crossing received "incomprehension and laughter" by external, foreign traffic planning bureaus, since it displays the exact contrary of what is done elsewhere, according to VCD (VCD, personal communication, December 19th, 2019). Another example for the tension fields between the involved agencies is captured in the picture below published in a local newspaper. The intermediate policy goal is to remove parking zones to artificially lower the cars' attractiveness, and to foster the alternative of bicycles at the same time by providing a better infrastructure. As can be seen in the picture, the for the instalment accountable agency (civil engineering agency, no response upon interview request) interprets this idea differently, taking space from the pedestrian away, instead of the parking area on the right side of the white line.

[4] ‚autogerecht' translates from German and means 'car-friendly'. Cities were designed around the usage of cars after the second world war. The objective to be car-friendly has created public architectures which today hamper a broad adoption of alternative means of transport. The term is also referred to as: 'autocity'

Figure 2- example of tension fields in implementation [5]

The examples present how the impacts of planned measures dissolve by varying perceptions of the involved agencies. Hence, the condition of a common mission can be stated to be not fulfilled.

2.2 - Availability of funds: Again, within the realm of the current AAQP (2011) version, the funding for the designed measures is secured. This is also due to the principle of subsidiarity and more over was not mentioned again within the interviews. The task of, for instance, conducting the effectiveness and technical analyses are transferred to other public agencies (EGDH, personal communication, October 23rd, 2019). Therefore, the mission is less dependent upon costly, external advisory networks or consultancies. However, if one looks beyond the current version and included measures, funding is stated to be a major burden in e.g. expanding the railroad system (EGDH, personal communication, October 23rd, 2019). Here, one can again refer to the afore mentioned lack of alternatives. This is also troublesome, since the public transport provider is a private firm dependent on revenue. As one example, the measure to increase attractiveness of the public transport by e.g. updated pricing schemes resulted mainly in increased ticket prices (VCD, personal communication, December 19th, 2019).

2.3 - The use of vetos: This section refers to the pivots regarding the administration's internal aspirations to enhance the situation. Note, the document creation, including collecting ideas or seeking for alternatives is a task for the administrative authorities, and not an output from politicians. However, the created plan requires a parliamentary vote to get into force. As such, the accountable authority whose task it is to design and establish the plan, has, in the end, only limited decisive power on what is done, and what not. Broadly speaking, the public servant in charge, before referred to as NAO, desires a political frame the ambient air measures could fit into. Contrary to this desire, the public servant perceives resistance on a variety of measures, since the inherent mechanisms necessary for environmental measures oppose the norm present in Hanover. Therefore, many arguments must be

[5] Courtesy of Samantha Franson; HAZ 29th January 2020, retrieved at 30th January 2020: https://www.haz.de/Hannover/Aus-der-Stadt/Kuriose-Verkehrswende-in-Hannovers-Vossstrasse-Raeder-sollen-auf-Gehweg-parken

settled for small steps (EGDH, personal communication, October 23rd, 2019). How this lack of political framing resonates is presented within the next example: It was found in the interviews, both EGDH and RME, complain about forays being battered down by people equipped with decisive (political) power. During the interview phase, this very phenomenon could be experienced: the EGDH stated that new road signs, enacted by the RME, could progress the entry regulations for the EZ, and like that, enhance the air situation. Such an action would be favoured by the EDGH, since it displays an effective measure independent from national legislation (new entry badges for the EZ). But, according to EGDH, does the higher ranked agency (RME) veto such decisions (EGDH, personal communication, October 23rd, 2019). Here, the vertical hierarchy, or rather dependency on regulation enacted from county level agencies appears. In turn, the RME acknowledges the problem and possible solutions, yet itself batters down the suggestion of new entry signage for the EZ. Regulations complicating the process was stated as one reason not to introduce the from national policy independent measure (RME, personal communication, November 7th, 2019). Moreover, the "battering" agency (RME) did itself state the problem of any effort coming from the administration being battered down from other agencies on the same level, or county level politicians (RME, personal communication, November 7th, 2019). Ultimately, an updated version of the AAQP Hanover, which *documents a compliance* with EU targets, *remains unpublished*. The plan, whose creation process was complete in 2016, includes diesel fuel driving bans as a measure of last resort. Though, this measure is politically excluded from the array of solutions by the coalition contract, hence the plan will not be published in the current version. The coalition contract declares that no driving bans will be installed in the city, hence does not pass the effective bill. As such, the city administration continued to enhance the plan, but is the envisioned solution path undesired by the local government and hence, vetoed. Though, the EDGH admits that a plan without any measure cutting-off traffic is unlikely to cope with the targets (EGDH, personal communication, October 23rd, 2019). This clearly presents how the mission is not based upon a common line amongst the involved actors, and moreover, how profoundly amendments and possible enhancements are vetoed vertically as well as horzontally, and at which costs. The solution for Hanover's ambient air problem is established by the city administration, though do local politicians blockade its implementation. Instead, pollution is continuously tolerated, and like that, efforts and investments by the involved agencies discredited.

2.4 - Openness to interest groups and outsiders: According to the interest unions BIU and VCD, the openness to interest groups is limited. According to these actors, the traffic agency is using outdated research for justifying current measures supporting the 'autogerechte' status quo and rejected a cooperation with an updated and different set of actors. In this connection, suggestions to invite Dutch or/and Danish traffic planning agencies (who are internationally known for their expertise) were dismissed (BIU, personal communication, November 26th, 2019). Another important representative of inner-city economy interests "active alliance 'local traffic' of local commercial agents [Aktionsbündnis Stadtverkehr Hannover] was not available upon an interview request, though can be stated that the

alliance favours the car as customer friendly shopping vehicle, further acknowledges the quality of public transport present in the city. Though, the alliance establishes a claim that these have reached their capacity limits and hence should not be additionally stressed (Aktionsbündnis Stadtverkehr Hannover, 2019). Therefore, the car should remain the most important mode of transportation (Aktionsbündnis Stadtverkehr Hannover, 2019). In connection to other kind of outsiders, Dirk Schmidt (EDGH) mentioned several attempts by an external company to market large public vacuums absorbing polluted air. These offers have been dismissed (EGDH, personal communication, October 23rd, 2019). The DUH stated Hanover to be falling off the "urgency-agenda" due to a comparatively moderate exceeding (DUH, personal communication, December 13th, 2019). Therefore, no statement in regard to the administration's openness to plaintiffs can be given. Lastly, some notions regarding the general target group compliance as discussed under condition two: On a pro side, the truck guiding system functions as desired. Here, the compliance mechanism of police controls is less challenging due to the greater visibility when compared to cars (EGDH, personal communication, October 23rd, 2019). As well did Dirk Schmidt (EDGH, 2019) state that the amount of special permit request for the EZ is constantly decreasing over the past years. Here, according to the policy planner, the desired effect has set in, resulting in people buying newer, cleaner cars. In this connection, it cannot be unmentioned that the Dieselgate and increased number of cars within the Region of Hanover significantly undermine the afore mentioned EZ's low effectiveness (EGDH, personal communication, October 23rd, 2019).

On a contrary side, measures promoting bicycling resulted in single shot applications. The VCD, accountable for cycling promotion projects in schools, could no longer remember an active participation in this project (VCD, personal communication, December 19th, 2019). Dirk Schmidt (EDGH) could not state anything recent about the promotional events regarding cycling or walking as a means of transport either (EGDH, personal communication, October 23rd, 2019). No trace of current promotional endeavours could be established, neither could be assessed whether these have effectively come to an end. Broadening the view towards a more general perspective, according to VCD, the motivation for compliance is not high. On the one side caused by lack of investigative action of the police, on the other side, limited motivation to comply for the citizens. As such, the increase in parking ticket prices and limitation efforts for these parking zones has only a limited effect if the compliance is not checked sufficiently. Moreover, it does financially not pay-off to pay for longer parking times, since an eventual penalty is lower than eventual parking costs for longer time slots. Moreover, the investigation of 'creative' parking is lacking according to VCD (VCD, personal communication, December 19th, 2019). Ultimately, the citizens in Hanover experience no significant curtailment by the policy and are hence likely to comply. To what extent the promotional measures function as desired is taken up in the effects sections.

3- Managerial and political skill: Speaking for the managerial skills required to coordinate the actions of several public agencies in order to establish one policy, the accountable person does have skills to manage a policy network. According to the EDGH, a policy network, consisting of in the matter

accountable public servants of municipalities from across Lower Saxony, is continuously active since the EU directive's emergence and meets up several times a year for a knowledge exchange (EGDH, personal communication, October 23rd, 2019). However, on the contrary, one might argue that managerial skills do not suffice, since a mismatch between the authorities' perceptions was found and hence, would require managerial work to align these. From another perspective, one can state that this task would go beyond the responsibilities of the accountable agency, facing again an issue of the principle of subsidiarity. Instead, leading to the political skills, the EDGH stated a lack of political mission statement guiding the (managerial) process. This lack of political commitment reflects as well in the publication blockade for the updated plan (EGDH, personal communication, October 23rd, 2019).

More political commitment, including a clear sustainability agenda, would be as well advisable in the light of a VCD statement. According to the interview participant, the planning processes were at times "hilarious". An urban planner did not take supermarket loading zones into account. Without an intervention of the VCD, a relocated metro stop would have blocked the supermarket's loading zone. The VCD claims urban planners having a too great distance to the objectives, and moreover a lack of a common line of how to process the objectives, resulting in questionable ideas (VCD, personal communication, December 19th, 2019).

4 - Support organisation: Beginning with the courts, a support in the matter from court decisions can be stated. The EDGH reported from charges against the EZ initial introduction, which were averted by the courts. Worth mentioning in this connection is the notion from EDGH of Volkswagen not favouring the EZ introduction. In this sense, the support for the matter is granted by the courts, despite opposition from the powerful economy (EGDH, personal communication, October 23rd, 2019). However, referring to political support, the section above presented the political resistance regarding more progressive (and for target accomplishment required) measures. In connection with the Dieselgate, the EDGH stated that the aspirations by the DUH to file charges against the city are perceived in a positive way. This is so, since a charge would likely increase the political pressure to pass the updated plan, or to opt for other (more promising) measures (EGDH, personal communication, October 23rd, 2019). Lastly, statements by the higher ranked authority (RME) exemplify again the resistance towards the objectives. As such, the accountable person on county level phrased the complete mission and system by which pollutants are measured to meet the targets as "hanebüchen" [Eng.: absurdity, outrageous, nonsense]. Moreover, the interview participant mentioned that he would come to work significantly earlier, since the parking spaces were limited in front of the agency building and public transport no option (RME, personal communication, November 7th, 2019). This presents how a public servant from the county level environmental ministry acts contrary to the policy's intention (limited parking space as motivation for e.g. public transport or cycling).

5 - Continuous importance: Here, the lack of political support can be mentioned another time. Moreover, other policies and events can be indicated which, according to the interviewees' perceptions,

significantly hamper the goal accomplishment of the examined policy. The plan is, despite of an available, updated version, still in force. According to EDGH, the topic is currently (to date for three years) put on hold (EGDH, personal communication, October 23rd, 2019). In this connection, the RME mentioned a decline in importance after the initial PM 10 problem has been resolved. Hence, a limited attention was paid to the subject of clean air in the time span after the PM 10 problem was resolved, around the year 2012, and the emergence of the 'Dieselgate' in year 2014 (RME, personal communication, November 7th, 2019). This became apparent in the interview with the plaintiff DUH as well: the EU Directive was designed according to standards and based upon the assumption of a target compliance due to technological developments. Given the existence of diesel fuelled cars exceeding the allowed limit values between 15 to 20 times, the target exceedance comes to no surprise. An indicator for the functioning of the successive pollution decline by the combination of the regulative approach and technological advancements is the goal achievement for PM 10 (RME, personal communication, November 7th, 2019; DUH, personal communication, December 13th, 2019). However, recent calculations of traffic loads (positive trend) and EZ's expected effects (limited) reveal that under the current entry calibration a target accomplishment is unlikely to be realised. Both, EDGH and DUH agree on having no other alternative than cutting traffic to reach targets (EGDH, personal communication, October 23rd, 2019; DUH, personal communication, December 13th, 2019). In this context, the public responsibility to continuously put efforts in enhancing the situation as embedded in §26 (3) BImSchV is not fulfilled, or rather breached, since for the measures have not been updated and others were phased out. Regarding conflicting policy, two items can be named in this connection. One is the subsidisation of diesel fuel. According to VCD and EDGH, the subsidies create misleading market incentives which again foster the dominant position of cars amongst available means of transport (EGDH, personal communication, October 23rd, 2019; VCD, personal communication, December 19th, 2019). Another hindering aspect, according to EDGH, is the refusal of the national parliament to introduce a next level badge for the EZ (EGDH, personal communication, October 23rd, 2019). The introduction of a more compelling EZ entry badge would add up to prior efforts and likely solve the problem. Hence, not implementing these might be evaluated as conflicting national policy. As mentioned earlier, the efforts to create a 'autogerechte' city after WW2 hamper the goal accomplishment by fighting against a dominant design today (RME, personal communication, November 7th, 2019). Moreover, according to VCD, metro lines were abolished in favour of busses during the 70's. The relocation of cycle paths might be evaluated as another rival factor to the ambient air policy, too (VCD, personal communication, December 19th, 2019). Lastly, another conflict are the different variances present in the measurement procedures. According to RME, the variance in target values narrowed over the years (as embedded in policy, pursuing a successive approach), but did the variance in the measurement technology remained constant at around 15%. In this connection, the participant named the measurement procedures as "outrageous" since the amounts are by the means of measurement stations not adequately computable, although they are legally binding. In that sense, speaking of a value of 42µg/m³ NO_x of permitted

40µg/m³ NO_x might be a close call (RME, personal communication, November 7th, 2019). However, one may refer again to §26 (3) BImSchV prescribing a continuous effort, regardless a target accomplishment. Indeed, 40µg/m³ NO_x is *one* target to comply with, but not the mission's *final point*. In that sense, the claim loses its impact.

Unintentional side effects: The unintentional side effects resonate with the policy's intended effects. Most strikingly, the target for NO_2 is (to date) 13 years after the root policy's introduction not met (AAQP 2007 & 2011 together build the legal basis) (RME, personal communication, November 7th, 2019). Regarding the change in behaviour, no, as far as a negative development of the situation has set in (EDGH, personal communication, October 23rd, 2019; VCD, personal communication, December 19th, 2019). According to EDGH and RME, the number of cars per capita increases annually.[6] Here, the dependence on the car for people living in the Region of Hanover is stated to be a reason for this development (EDGH, personal communication, October 23rd, 2019; RME, personal communication, November 7th, 2019). Also tied to the regional characteristics of the city, the increasing prices of the public transport stands as well in contrast to expectation (VCD, personal communication, December 19th, 2019). The price development might explain another negative trend. The city's modal split partially stagnates, but also develops perpendicularly the intention. Indeed, the absolute number of traffic participants increased stronger than anticipated within the calculation scenarios, though the share of individual rides increased as well, whereas the cyclist' share remained constant at around 19% (EDGH, personal communication, October 23rd, 2019). The mission statement of 25% for each traffic group/participant (¼ cyclist, ¼ pedestrians, ¼ cars, ¼ public transport) is therefore not fulfilled (Landeshauptstadt Hannover, 2011; EDGH, personal communication, October 23rd, 2019). Another aspect might be allocated to the unintentional side effects. As mentioned, the number of cycling fatalities increased, especially on the redesigned crossing spaces, leading to a ranking above the national average (VCD, personal communication, December 19th, 2019).

4.2.1. In essence: Burdens to cope with

Essentially, the implementation of the AAQP Hanover (2007&2011) is a partial success. The reduction of PM10 can be allocated the policy's positive account. Here, the ambient air quality plan with its measures has reached the desired effect of having "dust free" air, complying with the statutory requirements. Though, the examination also presents how the current measure catalogue is insufficient to cope with the remaining policy targets, especially under recent traffic developments. Having nearly only one measure taking the polluter pays principle directly into account, does likely not solve the problem in the long run. Here, the actual burdens faced by the local policy makers set in. In order to reach the desired end state in a timely manner, more progressive measures are required. Though, policy makers face two major burdens. First, the public perception of the individual car coupled with resistance

[6] *14% more cars during the last ten years within the region see: https://www.haz.de/Hannover/Aus-der-Stadt/Zahl-der-Autos-in-der-Region-Hannover-steigt retrieved at: 23rd January, 2020.*

towards changes in the status quo, secondly, the lack of alternatives and costs connected with these alternative solution paths. The city has been re-designed for the car after the second world war (‘autogerechte’ city) and now, it is correspondingly difficult to alter this structure. Especially in connection with the public desire to drive an individual car and the limited (local) funds available to introduce the ‘traffic turnaround’ [Ger.: Verkehrswende]. In addition, the city administration’s options to cope with lack of national support are battered down by regional agencies, other solutions beyond political influence/power. As one example the division of planning and implementing agencies, including varying perceptions are to be mentioned. As well as the funding of for instance a concept like *free public transport*, or solely the instalment of new metro lines are burdens which if ever hardly can be overcome without national funds. Moreover, national policy hampers the aspired end state. Diesel subsidies foster a to mission misleading perception, little has been done to foster public transport or other means of mobility. Solutions therefore would be a clear political agenda, comparable with the one as found in Leipzig’s ambient air plan. Instead of sustainability goals, a political framework could include mechanisms which assure independent cycling networks, an entry fee for cars within the city (city toll), or a certain quota for trees for every kilometre of street, to name a few by expert interviews informed suggestions. In short, to politically assure a sounder application of the polluter pays principle, leaving no or a more limited space for agencies’ individual scope of action. Perceiving the principle literally, -paying-, to fund alternatives, such as reduced prices for public transport, to alter the relations between the modes of transportation in cost-benefit analyses.

Again, this step has not been done yet due to political reasons (lack of majority for the parliamentary vote). Therefore, the potential charges by the DUH are a positive factor influencing the debate and policy process towards more effective measures. Here, the discrepancy between the national and local political level can be mentioned. What could be done on a local level in terms of political mission statements, would require a national level back up. However, such a national back up, as the interviews reveal, lacks behind.

4.3. Transfer of Insights

What can be said about the findings in the light of Essen and Leipzig? This chapter transfers the insights gathered above to the remaining cases. Note, due to lack of available resources, merely the key legislators of the respective towns were interviewed.

4.4. Implementation Conditions: Perceptions in Essen

Regional Administration of Düsseldorf – Department for Immission Protection

In the following, the interview participant will be referred to as RADE, which articulates statements by the Regional Administration of Düsseldorf – Department for Immission Protection [Ger.: Bezirksregierung Düsseldorf Dezernat 53 – Immissionsschutz].

1- Theory: At this point, it should be referred to the analysis of AAQP Essen (2011). Unfortunately, the interview participant from the Regional Administration of Düsseldorf (RADE) was not yet accountable for the examined version. Nonetheless, the examined version was recently amended as a response to charges from the DUH. Therefore, the interview reflects on more recent events in connection with the settlement and new plan (RADE, personal communication, January 30th, 2020).

2- Target group compliance – and sub-classifications

2.1 - The objectives are clear amongst implementing agencies: The afore described issues of varying perceptions amongst the implementing agencies was not (fully) confirmed within the telephone interview. Generally, this condition can be confirmed, but were obstacles mentioned in connection with measures limiting the parking space. Here, a conviction of smallest administrative units was difficult to reach from the higher-level perspective (RADE, personal communication, January 30th, 2020).

2.2 - Availability of funds: As observed in Hanover, the funding for the measures included in AAQP Essen (2011) is secured. However, if one looks beyond that scope, funding is again stated to be a major burden. Here, the participation at the national model project significantly eases the pricing and ticketing system for public transport (RADE, personal communication, January 30th, 2020). Though, the participation at "Sofortprogramm Saubere Luft 2017-2020" [Eng.: "immediate programme clean air 2017-2020"] must be named in this connection. Here, national funds significantly support the new approaches found in Essen but are these tied to burdens as well. Indeed, funds are available but do bureaucratic guidelines and lengthy procedures hinder the procurement processes. The funds are granted, but is it, at times, not possible to invest in time due to other, existing contracting obligations (RADE, personal communication, January 30th, 2020).

2.3 - Decision rules supportive/Veto points: As mentioned earlier, the participant mentioned some unwillingness on lower administrative levels to e.g. limit parking spaces due to the fears of the local entrepreneurs of losing additional customers to the internet. The afore mentioned argument of greater, concentrated buying power in areas with no cars was eventual reluctantly accepted. (RADE, personal communication, January 30th, 2020).

2.4 - Openness to interest groups and outsiders: Referring to the recent cooperation with the plaintiff DUH, the openness to outsiders is given. To that extent, that one could explain the current mode of cooperation as 'open books'. Being continuously open for cooperation and enhancements coming from the DUH is furthermore laid down as a section in the amendment. The positive aspects about this cooperation between administration of different level was confirmed from both sides (DUH, personal communication, December 13th, 2019; RADE, personal communication, January 30th, 2020).

3- Managerial and political skill: As observed in Hanover, a political leader, albeit on county level in this case, has claimed driving bans to be unlawful. According to the participant, this counter-opinion has aggravated the process. Despite this political aggravation on county level, a gatekeeping solution

(instead of driving bans) was agreed upon for highly polluted roads. Therefore, one can state that the managerial skills of the accountable public servant has settled the dispute between involved agencies. The new solution is less discriminating than a pure diesel driving ban, since the gatekeeping measure is irrespective of the engine type (DUH, personal communication, December 13th, 2019; RADE, personal communication, January 30th, 2020).

4 - Support organisation: As mentioned, the process was, as found in Hanover, hold up politically. A drastic change of this politically hampered situation set in once the plaintiff (DUH) was present. Before the settlement took place, one can refer to the political statement on county level of driving bans being unlawful, even though the current solution does not differ significantly (RADE, personal communication, January 30th, 2020).

5- Continuous importance: As in Hanover, the particulate matter issue was resolved around the year 2013. Car engines were expected to have reached significant enhancements in emission extents by then, so the NO_x problem was expected to be resolved by then, too. However, here one must refer to the limited time the current accountable public servants oversee the matter (since 2013). Furthermore, the public servant welcomes recent societal trends, expressed in movements like Fridays for Future, since these support the policy's objectives (RADE, personal communication, January 30th, 2020).[7] As a conflicting point the special administrative structure regarding the highway which is traversing the inner city can be mentioned. The responsibility for the measure to cover the highway up is divided across the county and national level. The regulative authority is currently being reconfigured. Therefore, the county of North-Rhine Westphalia assigns a top priority for this measure on national level. Perceived in this manner, regional, or rather national legislation is bringing forward the solution, although the presence of the highway significantly hampered the prior clean air efforts. Moreover, and partially addressed in the section above, the car-friendly town can be mentioned once more in regard of rival factors. Moreover, the fact of commuting larger distances within the Ruhr-Rhine area was mentioned to be burdensome in regard of local air quality control. As such, this point might be also allocated to lack of alternatives and spatial circumstances (RADE, personal communication, January 30th, 2020). Lastly, the Dieselgate is mentioned once more in connection with rival factors unconsidered in the policy. According to the respondent, the scandal has created a scenario in which the initial anticipated solution path no longer functioned. Perceived from another angle though, the fraud has created political pressure for more commitment and national (funding) support (RADE, personal communication, January 30th, 2020).

[7] Fridays for Future is a student movement which protests for more progressive, environmentally friendly national legislations.

4.5. IMPLEMENTATION CONDITIONS: PERCEPTIONS IN LEIPZIG

Department for Environmental Protection division for environmental precaution

The interview via email with the in the matter accountable public servant is plotted upon the conditions for successful implementation. Therefore, the specific citations are waived, since the complete answers refer to the same email. The complete e-mail can be found in the appendix (in original language). The interview participant will be referred to as DEPL, which articulates statements by the Department for Environmental Protection; division for environmental precaution, Leipzig [Ger.: Amt für Umweltschutz, Abteilung Umweltvorsorge].

1 – Theory: Again, the examination refers to an older version of the plan than currently is in force. The examined plan was successful regarding PM 10, too. The target can be continuously complied with. However, the examination presents the plan was being insufficient to comply with NO_2 requirements and was updated accordingly. It can be stated that the theory acknowledges the city's growth and limited, available street space. Hence, a more just realignment for all included traffic participants is one stated objective. Despite, a well-functioning commercial transport [Ger.:"Wirtschaftsverkehr"] is stated to be a top priority when designing and implementing measures. This priority confirms when looking into the data. The respondent puts a focus on traffic guiding measures to minimise traffic impacts on busy roads. This objective translates into a redesign of turning-lanes-relationships and measures adjusting the flow of traffic. To what extent these measures are expected to enhance the situation is not stated. In this connection, one may refer to Hanover, where these traffic flow optimisation technologies are still being configured about ten years after its introduction. However, according to the DEPL, about 50% of the citizens are unsatisfied with Leipzig's air quality, though do 60% of the survey participants do oppose towards a diesel fuel driving ban. The opposing group's majority is aged in between 45-54 years, according to DEPL.

2 - Target group compliance – and sub-classifications

2.1 - The objectives are clear amongst implementing agencies: According to the person in charge for the ambient air plans in Leipzig, administration's internal disputes about e.g. anticipated solution paths are resolved within the chief administrative entity, the mayor's commission counsel. Moreover, the respondent refers again to the self-proclaimed environmental quality targets [Ger.: „Umweltqualitätsziele"].

2.2 - Availability of funds: Here, the national funding programme ("immediate programme clean air 2017-2020" [Ger.: Sofortprogramm Saubere Luft 2017-2020]) is mentioned to be a significant element in the funding for the updated measures. However, it is not mentioned where these funds are used in particular. As indicated in chapter 5.1, the policy created in Leipzig (version 2009) stands out in funding itemization (e.g. fixed budget for annual cycling network expansion). Notwithstanding, a dependence of national funds in regard to target compliance is stated once more.

2.3 - Decision rules supportive/Veto points: As mentioned, and according to DEPL, varying opinions within the administrative body are aligned by the mayor's commission counsel. As such, the claim from Hanover of competing agencies between the levels is not confirmed in Leipzig. Here, the response is positive, reporting from a cooperative atmosphere of involved public agencies from different levels. The local economy initially opposed the EZ, is now confident, according to DEPL. However, the respondent also mentioned the imperative to convince e.g. the unions from the measures' benefits.

2.4 - Openness to interest groups and outsiders: The same planning bureau as active in Hanover was found within the planning process. However, the planning bureau was not available upon an interview request. Besides the, in sample comparison, extensive participation process, nothing can be stated regarding the openness to interest groups. Only an analogous comparison can be established: given the statements from the respondent to have put great efforts in convincing the local economy for the current solution path of a car free inner city, a certain robustness might be concluded. In this sense, that the city has introduced a measure despite the (initial) opposition by the local economy.

3- Managerial and political skill: Referring to the extensive public participation process in the measure design phase, the successful introduction of the amendment, as well as self-proclaimed environmental quality targets, the managerial and political skills can be confirmed. Especially, when compared to the degree of action with the remaining sample. Here, the introduction of the amendments did not take place, or did not happen without the national pressure. The mayor's commitment in the matter positively influences the process.

4 - Support organisation: The local economy representative (interest union) were against EZ introduction in 2011 as first EZ introduced with (progressive) green badge. Claims of interest groups could be averted, the opposite of their claims set in: more tourists booked hotels within the inner city after the introduction, as well did not a single store closed because of its introduction, according to the respondent from Leipzig.

5 - Continuous importance: The claim established for Hanover (importance declined over time) cannot be confirmed for Leipzig upon available data. Since the examined plan was amended and introduced, it cannot be stated that a lack of continuous importance would block e.g. the plan's adjustment and introduction, as it was found in Essen and Hanover. In addition, the self-proclaimed environmental quality targets assure a constant alignment with existing credos. Moreover, the concept of a car free inner city was further developed. As rival to the policy, the afore mentioned, new entry sticker/badge for the EZ would have been a desired national support as well. The federal government not introducing it is therefore perceived as a burden on the local level, too. As well is the federal government's crisis response regarding the Dieselgate's aftermath named as a burden, since hardware updates of affected cars would have been an effective solution. Hence, a non-acting from the county level in terms of the creation of supporting legal frameworks is stated as a hindering aspect in the course. However, no further explanations about such a framework's design are indicated within the data.

Social desirability: It is as well perceived in Leipzig that measures which curtail the private car use more progressively cannot gain a majority. As well are plan-opponents as well present in Leipzig, and according to the respondent, no exchange of opinions possible. Here, the respondent mentioned the unwillingness to collaborate of people who perceive ambient air measures as restriction of their individual freedom. In other words, some individuals are simply against a policy, without being willed to communicate alternatives.

Unintentional side effects: The respondent did not mention anything regarding this subchapter. This might be due to the preservation of a good image and the type of interview conducted, leaving the opportunity for closed answers.

4.6. Transport Regime understood as Policy

Here, the results gathered in the analysis chapter are briefly positioned against the finding from Italy, referring to a similar research objective (Moradi & Vagnoni, 2018). Note, it shall merely indicate possible research paths for the future.

- Land use and urban structure
    - It presents as well, that the urban structure depicts a problem for current low carbon endeavours. One may refer to 'autogerechte' city again. The example of altering a turn-around back into a crossing (Hanover) leads to the next point.
- Resistance of decision makers
    - The resistance was clearly found in Hanover, in which a promising plan remains unpublished due to a coalition statement. External pressure weakening blockades could be indicated in Essen.
- Open and general goals and regulations for clean mobility
    - This aspect resonates in Leipzig, in which the mayor's commitment in the matter, as well as the self-proclaimed sustainability targets positively influence the cooperation between the agencies and general policy direction.
- Increasing demand for mobility
    - In connection with the calculation scenarios and Dieselgate, this factor has been found to be determinant for target exceedances.
- Resources and infrastructure
    - A lack of alternatives, decisions in the past which promote the use of car as a means of transport.

- Funds for infrastructure development
    - Here, the charges by the external agency DUH resulted in available funds. As well as the participation in national funding programs. Though, these emerged after the Dieselgate has set in. In this connection, the burdens tied to the investments of available funds must be mentioned.
- Technological strengths
    - Price, comfort, and time advantages of the car, lack of regulations to alter the setting.

The brief reflection on the landscape factors influencing the regime (understood as policy here), as adopted from Moradi and Vagnoni (2018), indicates an overlap between the Italian and German case, and moreover, the contextual pressure local policy must consider besides the actual policy objective of clean ambient air.

4.7. SUMMARY

To summarise the comparison of the insights, the following aspects can be mentioned in relation to the implementation conditions: the tension field between the implementing agencies was found across the sample, although the impacts are found to differ from one another. This can be explained by a limited data exploring external agencies' perspectives. It is simply unlikely that an agency admits greater disputes regarding own efforts. Undoubtedly, the Dieselgate influences the process. On a positive account, the Dieselgate supports the continuous importance, which was found across the sample to have weakened after initial successes regarding PM 10. Besides, it can be stated that is difficult to politically curtail the private motorised transport towards alternatives such as bicycles or the public transport. It was mentioned throughout the sample that large efforts are required to promote or bring forward alternatives to the car, since these alternatives include trade-offs which citizens hardly are willed to accept. As well is the funding for these alternatives mentioned to be a burden across the sample. Ulitmately, one can state that the reason for the non-compliance is located within the content-related realm of the ambient air endeavours. The theories embedded in the documents are not capable of effectively targeting the problem cause, the motorised car traffic, due to the afore mentioned reasons. Here, the societal position the car has, urban infrastructures designed according to the use of car for decades, the Dieselgate, lack of realistic alternatives can be named in this connection.

5. DISCUSSION

The findings reveal that the local environmental agencies are aware of the theoretical shortcoming of their AAQP. Hence, a possible answer for the research question could be: the cities do not meet the targets, because the policies are not capable of solving the problem. As such, the major error is found

within the content-related aspects, and not in the process related characteristics. However, this answer would not explain the reasons to a satisfactory extent. Perchance the most obvious reason for the policie's non-compliance is the limited extent to which the problem cause is being tackled in a direct way, taking the obligatory polluter-pays-principle into account. Here, another finding can be mentioned. The local policies overlap in the way the problem is approached. Commonalities in the approaches have been explained by the common legal basis for the AAQP. As such, included measures curtailing the car traffic are dependent upon the national legislation regulating the for the zones required emission badges. As such, the study finds that the policy theories lack behind in terms of targeting the problem cause in a direct fashion. This finding is supported by the decade in which the examined measures are in place without compliance, and the recent settlement between the Regional Administration of Düsseldorf and the plaintiff DUH integrating direct measures limiting traffic amounts on affected streets into the amendment.

However, it has been indicated how a political decision of curtailing the car traffic, hence a direct measure, would present a 'political suicide'. Albeit the plans are created by the cities' administrations, and not by the political parties, the political leaders are the missions' faces regardless. From a different perspective, the examined plans display the best possible agreement under the given structures. And these structures are complicated to overcome in several ways. First of all, the managerial burdens connected not only with the measure creation, but more importantly, with the implementation. The interviews reveal how difficult it is to align the agencies' varying values and to bring forward ideas in the realm of administrative agencies for existing measures. The example of the bike rack which was installed on the wrong side of the walkway displays the existing tension fields. However, this shall not disregard existing efforts, though are the anticipated modal splits of e.g. 25% cyclists not reached in any of the examined cases, suggesting that the measures' effects are limited. As well are the traffic loads, with which the policies work, outdated, since the traffic loads increased more than expected. Referring to the reasons explaining the current, to be found, limited policies' effectiveness, a variety of aspects can be mentioned. The policies have been found to be lacking in quality, but why were not better measures installed? First of all, the afore mentioned 'political suicide' in connection with measures curtailing the individual freedom a car has to offer must be mentioned once more. Also due to the urban architecture, which orients along the use of cars since WW2 (autocity), no realistic alternative to the car is present. To create these alternatives, several burdens are present. If something must be diminished, an alternative should be fostered in order to motivate the anticipated change. Here, the necessary capacities are not given. The public transport, which is an important pillar in the goal accomplishment, is provided by private enterprises. Besides this fact of private ownership, it would be unlikely to invest the required amounts in public transport, given the political plot situation. In addition, the funds are not simply available on the local level. Moreover, regional characteristics, like remote areas, a public transport solution would additionally be complicated. As more recent motions from Essen present, if the

funding for e.g. environmentally friendly public transport busses is made available by national funds, these funds cannot, or only connected with burdens be invested as indicated by an interview partner.

Talking about the national level, the documents indicate a negative influence from national legislation. Each of the cases has measures installed which filter the traffic coming from national roads, suggesting a disturbance from traffic of national roadways. Speaking for Essen, the case in which the plaintiff DUH and the city administration have recently reached an agreement. Here, funds are being made available, and the accountable public servant indicated the investment burdens. Moreover, the role of the national level in the problem solving process might be described with a measure included in the recent settlement. Next to the provision of national funds, a cover will be constructed across the highway which leads through the city of Essen. Like that, the national stake in the problem solving is literally to cover the problem. Finally, these reflections allow to raise the argument of the problem being not only too large for a single local policy to be accomplished. Even if the major stands behind the mission, as desired from a public servant in Hanover, a city-wide aspiration, going beyond the single policy's scope, does not solve the problem either. Here, the raised argument refers to Leipzig where the public participation process to collect appropriate measures was conducted and aspirations for a car-free inner city expressed in the document. These intentions are as well coupled with non-compliances. Suggesting that the local level is indeed the place in which the pollution hot spots can be found, though not the best place to administer the problem. Here, the principle of subsidiarity applied in the matter might be questioned. The application presents how a policy goal dissolves in the implementation processes, and although the local political will is given, as was found in Leipzig, no compliance can be reached with the present municipal managerial and funding capacities. As has been mentioned, the problem of ambient air is targeted via the field of transportation within this study, though are industry emissions included in the legal scope as well. Ultimately, one may question whether the problem of local ambient air pollution is not better off to be resolved by additional national legislation. Here, resolving the afore mentioned advantaging taxation on Diesel might be a good point to start. However, as the 'problem covering' efforts in Essen, and the limited aftermath of the Diesel scandal to date suggest, the national level does not yet seek this responsibility to do so. Instead, a continuous exposure to evidently hazardous extents of pollutions is being politically tolerated on the local level.

5.1. Limitations and Future Research

Within this chapter, the study's limitations and possible outlooks for future research are taken into consideration. Consequently, the different dimensions of validity are reflected upon. To begin with, the content validity. The study targets the individual car and the liberal use of it as the underlying problem. Though, this perspective results from the problem examination in which becomes apparent how precisely the aforementioned narrative must be objectified, in order to orient towards alternatives. If a policy goal of clean ambient air is to be accomplished, it logically must target the main problem *cause.* The analysis results in a picture in which the individual car is furthermore promoted within the structures

of legislation, and moreover within the mindsets of implementing agencies. Unfortunately, none of the agencies, which were indicated as 'problematic' by the interviewed actors did respond to the interview requests. Like that, it is the best picture which was possible to be retrieved. The construct of this study examines the approaches towards the policy objective and how the accountable actors perceive the execution of the subsequent implementation conditions. Here, the aforementioned, indirect relation between the policy objective of clean air and the 'car-narrative' must be mentioned. It is argued, that the approach ought to be direct, and not indirect. Admittingly, an indirect approach towards the policy objective may result in the same extent of target accomplishment. Though, are the targets accomplishments not given in the mostly indirect approaches. Again, the number of measures has no explanatory power about an impact. However, the interviews, especially with the plaintiff in the subject, the Deutsche Umwelthilfe (DUH), presents how the problem cannot be resolved, unless the problem is targeted in a direct manner. As an example, the gate-keeping solution as now introduced as a result of the charges in Essen can be mentioned. Regarding the criterion validity it can be justified that the organisation of this study is of an explorative nature. Indeed, the concept has been positioned against the MLP, but were the essences of the reflection not directly used within the interviews. Vice versa, this point might be addressed as a weak point within the construct validity. However, the actor perceptions could be explored under the current setting, resulting in clear results. Though, the internal validity can be confronted with the applied coding. However, it can be justified by the small-n and the open character. Given a hypothetical 'positive-car-narrative', the e.g. key legislator likely would mention the same aspects, like the strong societal position of cars. The external validity presents likely the biggest burden for the current concept. If, for instance, the insights of this study were transferred to another, by the EU directive affected, European member state, difficulties of different administrative and legislative structures would need to be faced. The brief comparison with the findings from the MLP study on low carbon mobility conducted in an Italian case by Moradi and Vagnoni (2018) indicates promising results, albeit these insights are freed from any conclusion within this study. As has been mentioned, it merely indicates a possible future outlook. As for future studies, it might be interesting to integrate this qualitative research into quantitative methods, given the measurable changes in emissions expressed in quantitative terms and qualitative objects like policies or societal trends.

6. CONCLUSION

This research followed the unique approach of examining the technical topic of air pollution control in the realm of public administration studies. To the researcher's best knowledge, no study has addressed the weak points of air pollution control in the light of local policy perspective before. The assessment about the content-related, as well as procedural aspects uncovers how certain measures either dissolve

in the tension fields between involved agencies (same level), or how for a goal achievement required measures cannot be realised under the current managerial structures. This was found to be due to varying reasons. To name a few, insufficient (local) funds for investments in sustainable mobility, a social desirability of the status quo, or the political plot situation local decision makers find themselves in can be referred to when addressing the reasons for shortcomings in both, policies' content and process. The situation might be compared with the chicken-and-egg problem, which is further stressed by a lack of political support from the national level. The local policy makers must decide, but which advice informs which decision? The political agenda, shaping the societal will, or vice versa? The EU Directive and obligations stemming from the national translation of this directive in fact indicate the need for a clear political agenda, and not societal shaping now creating the political plot situation. It has been found in Hanover that a documented functioning plan including updated figures for scenario calculation remains unpublished, since it is politically determined not to implement measures, which would reach a compliance with EU targets, though would the traffic be curtailed by them. Ultimately, the study presents that not only the Dieselgate has hampered the goal achievement on the local level, but also the lack of coordination and political support within the measure implementations prior the Dieselgate. Like that, errors in both the policies' content as well as in the implementation processes could be indicated. Tracing to the Dieselgate once more, the study also finds that due to afore mentioned short coming, the measures are unlikely to meet the targets, even without the emergence of a Dieselgate. Like that, the indicated weak points might have accounted for a non-compliance alone, regardless the Dieselgate's negative effects on the overall process.

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Appendices

Appendix A: Measure catalogues and analyses documentation

Measures: Essen, Germany; AAQP 2011

The AAQP for the city of Essen displays a special case when compared with the rest of the sample. That is so, since the administrative entity designing the measures is not located in the city of Essen itself. Instead, Essen belongs to the regional administration of Düsseldorf. To this administrative region belongs, next to Essen, also the cities of Duisburg, Oberhausen, and Mühlheim an der Ruhr.

That results in a policy design in which measures for each city are designed and listed independently from one another, are yet are summarised in one policy. This policy cluster has been established since the regional administration acknowledges the dense cultivation within the region, which demands an integrated, regional approach given the transboundary nature of pollution. Therefore, combined efforts applied in the region and moreover policies implemented on the local level are required to target the overall pollution of this region. Therefore, the regional and local measures applicable in Essen are listed below. However, the regional measures mostly define the policy frame for local norms.

Goals:

Ultimate goals:

a) The realisation of the legal obligations (national) is defined as the ultimate goal for this policy. Chapter 1.2 AAQP Teilgebiet Ruhrpott-West (2011) phrases the steps of defining the problem situation, appropriate measure creation, and responsibility distribution to assure a permanent compliance. These steps refer to the policy's purpose which is mentioned and adopted from national and EU legislation, being the prevention and protection of the human health and the environment from hazardous impacts.
b) Reach policy coherence with noise pollution and traffic safety

Intermediate goals:

a) Traffic avoidance
    a. It is acknowledged the traffic being the main problem contribution, a decreased in individual motorised traffic is therefore appointed as an intermediate goal
b) Traffic calming
    a. Reduce traffic in residential areas
c) Construction of bypass roads
    a. Reduce traffic load at hot spots

d) Establishment of extensive, related environmental zone
    a. Driving ban for older and, or polluting cars within zone

Problem:

a) affected population: 576.259 inhabitants (p.17)
b) emission in reference year 2009 (urban) (common years within sample) // p. 66 annual average
    a. NO_2: 43-58 µg/m³ // 74% of NO_X is caused by road traffic
    b. PM10 29-38 µg/m³ // 08% of it is caused by road traffic 60% regional background
    c. 5/7 measure points exceed 40µg/m³ NO2 (48, 54, 42, 60, 43, 38, 34) (p. 77)
c) Emission in reference year 2009 (background)
    a. NO_2: 34 µg/m³
    b. PM10: 24 µg/m³, 10 days of exceedance

Regional measures (apply in entire administrative district)

(AAQP Teilgebiet Ruhrpott-West, 2011 p. 113-122):

According to cluster: measures of traffic, industrial, and other

1) Mobility management; opportunity to consult a more efficient and sustainable traffic by fostering sustainable means of transport
2) Tailored public transport ticketing
3) Promotion of public transport ticketing for public servants (if desired)
4) Promotion of public transport ticketing for private businesses (if desired)
5) Increase of park and ride parking, parking exploitation in impact areas
6) Incentives for public transport (partially paid tickets for customer)
7) Increase and enhancement of regional cycling roads
8) Purchase of NO_2 friendly busses
9) Tendering procedure accounting eco-friendly busses for pupil transport
10) Guide truck traffic away from emission hot spots
11) Promotion of environmentally friendly driving attitude
12) Public employees shall travel environmentally friendly
13) Promotion of environmentally friendly mobility in businesses
14) County and regional planning, whether AAQP can be either integrated in regional or local polies
15) Construction management shall consider remote heating, energy from non-fossil fuels, and avoidance of additional urban canyons
16) Dust reduction measures at construction works
17) Low emission construction machines

18) Energy supply intends to “go green”
19) Municipalities may participate at “European Energy Award” if applicable
20) Public relations coherence within the Ruhr area
21) The police receive investigation authority for compliance of measures addressing traffic regulation
22) Authorities are obliged to report implementation statuses and issues

- In addition, an environmental zone is introduced from January 2012. This zone spreads across the region but is defined per city. Entry barriers are defined according to emissions stemming from vehicles. As such, the introduction is dealt in a successive manner, meaning from the beginning, vehicles of emission group 1 are no longer allowed, increasing annually resulting in a ban for emission group 3 effective from January 2014 on.

Local Measures (p.133ff):

1) check adjustment for noise pollution wall Hombrucher Strasse
2) check tempo limit on highway A40 to 60km/h respectively 80km/h, whether emissions can be effectively decreased
3) blocking a highway inroad during the week
4) relocate the same highway inroad
5) passage ban for trucks above 3.5t Gladbecker Strasse
6) relief for diverting road for trucks
7) public transport plan, remains status quo(!)) but motivates usage
8) priority switch in traffic lights for public transport
9) continuation of Essen 2010 (cycling road network)
10) new cycle paths connecting green areas in the town
11) environmentally friendly traffic concept
    a. priority for gas vehicles in buying options
    b. rule to have particle diesel filter in newer cars
    c. free of charge public servants public transport tickets
    d. usage of car sharing
    e. introduction of eco drive trainings
    f. successive intro of cycle share system “metropolrad ruhr”
12) low emission vehicle usage in high emission districts (trash and clean trucks)
13) traffic flow management, B224 having priority
14) PV systems on city buildings for private investors
15) Renovation of high energy consuming public building facilities
16) Energetic modernisation of buildings
17) Participation “Konvent of mayors”, aim to reduce CO_2 emissions by 20% by renewable energy
18) ÖKOPROFIT, consultation of business to become more energy efficient

19) Vegetation project to decrease background emissions
20) Planting of 77 ivy vines in one road (Gladbecker Strasse)
21) Traffic control / investigation with support by police
    a. Second row parking
    b. Speed limits
    c. Unnecessary engine usage
    d. Parking on cycle roads or pavements
22) Increase of natural gas stations, promotion campaign including taxis

Additional remarks to AAQP Essen:

Measures for avoiding traffic (p. 182)

Measures intending an avoidance of individual motorised traffic are perceived to be especially effective for combatting pollution. However, a quick success of these measures cannot be expected, since a broad change in minds and behaviour is required to gain the desired effects, according to the policy. In order to achieve these desired effects, the AAPQ Teilgebiet Ruhrpott-West (2011) refers to drawbacks listed below. Financial aspects are stated to hinder the target accomplishment.

Project group (chapter 1.6 AAQP Teilgebiet Ruhrpott-West, 2011): since the measures examined here fall into a regional administration, the coordination of the endeavours is embedded in a project group. It is acknowledged that integrated efforts of all municipalities in the region are required to tackle the problem.

Public participation (chapter 1.7 AAQP Teilgebiet Ruhrpott-West, 2011): § 47 section 5 BImSchG predicts a public participation in the policy design and amendment processes. The policies are made available to the public for the duration of one month, after which each citizen of the region has the chance to bring up suggestions for two weeks. The suggestions shall be evaluated and considered in the process. These suggestions and according evaluations are as well made available to the public.

Regional measures do not include mechanisms to assure compliance or implementation. As such, the measures are formulated in a broad fashion and partially do not include a time frame. In other words, the intention is expressed, the path and timeframe are left undefined in the policy.

Measures: Hanover, Germany; AAQP 2011

In the following, the AAQP Hanover (2011) is examined and displayed in a goal tree.

Goals*:* The ambient air policy's intended effect is the preservation and enhancement of the local mobility, while the mobility's environmental impacts are being decreased, and to decrease the emissions from the remaining motor vehicles (Luftqualitätsplan Hannover, 2011). These intended effects stand in a direct relation to the EU ambient air targets including pollution extents of e.g. 40µg/m³ NO_x.

For reaching these effects changes in the citizens' behaviour are required, as stated in the policy. Effectively, this means fewer people use their own car, and to use to the car alternative means of transport more often. Intended user alternatives are stated to be shared vehicles, public transport, bicycling, and walking (city of short distances) (Luftqualitätsplan Hannover, 2011).

Ultimate goals:

a) Enact an AAQP to comply with EU and national obligations. Due to pollution hot-spots within the city area, a shift in competences from county to city level has taken place. Therefore, the city of Hanover is from then on accountable for the establishment of an AAQP. Therefore, the before existing plan is updated by the new authority for the matter.
    a. Measures applied before are proven to be insufficient to meet the targets. The targets, especially the pollutants of NO_x and PM 10, have been missed for several years, which shall be accomplished now with the updated version.
b) According to the AAQP 2011, it can be foreseen that the targets cannot be reached within the given timeframe. Therefore, the AAQP 2011 includes an application for a deadline extension of five years (until 2016) in order to avoid infringement procedures.

Intermediate goals:

a) Preservation and enhancement of mobility while decreasing environmental impacts.
b) Decrease of emissions of remaining car traffic

According to the AAQP Hannover (2011), it is to be foreseen that measures from the prior AAQP (2007) are insufficient for coping with the air quality standards set out by the EU. Like that, it can be read in the preamble that the targets have overshoot for several years, thus the policy must be adjusted to comply. Moreover, the inclusion of, at that time unconsidered, pollutants are to be included.

In addition, the competences in the manner of ambient air were reallocated. Since 1rst of April 2007, the local communities are responsible for the establishment of AAQPs. Derived from that shift, the city of Hanover does not only adjust the measures, but also applies for a deadline extension of five years for

the goals to be reached. Like that, the AAQP at hand does not only intend to meet the targets, but also to get more time to reach these.

Problem:

a) affected population (here, population within environmental zone): 218.000
b) emission in reference year 2009 (urban)
    a. NO_2: 53 µg/m³ // 74% of NO_X is caused by road traffic
    b. NO_x: 123 µg/m³
    c. PM10 26 µg/m³, 7/35 exceedances // XXX% of it is caused by road traffic XX% regional background
c) Emission in reference year 2009 (background)
    a. NO_2: 20 µg/m³
    b. NO_x: 26 µg/m³
    c. PM10: 18 µg/m³, 4/35 exceedances
d) immission causer (cluster)
    a. traffic (street, flight, water, rail, and off-road traffic)
    b. industry (permission required installations after 4 BImSchV)
    c. agriculture (fields and animal farming)
    d. non-permission required installations (industry and small-scale furnaces)
    e. other anthropogenic and natural source of emission
        i. AAQP refers to local emissions caused by PM 10 and NO_2
        ii. Therefore, emission groups of traffic, industry, and small-scale furnaces are appointed

1) Inner city passage ban for trucks above 12 tons (highway toll avoidance drives)
2) Truck traffic guidance concept
3) Traffic flow optimisation in connection with decrease of driving speed
4) Reduction of driving speed to tempo 40 on Göttinger Street (in connection with noise pollution policy)
5) Low emission road surface if streets are refurbished
6) Street planning and redesign of road spaces (optical street narrowing and trees alongside)
7) Trees along road, increase of plants within city
8) Procurement of low emission vehicles and machines
9) Effective public relation measures
    a. Continuously updating internet presence regarding air pollution control

b. Printing of 350.000 booklets and 1.500 poster made available in public agencies
c. Information and environmental advices for environmentally friendly mobility in other publications
d. Information via press, radio, and television
e. Information events and stands at events
f. Campaign day “car free Sunday” from 2008 to present
g. Presentation regarding efforts in Hanover in other German towns, as well as in Austria
h. Guided city tours “ambient air and noise pollution”
i. Business consultation to motivate carpooling and use of job-ticketing (public transport concept ‘eco profit’)
j. Support associations and unions offering environmental education in schools

10) Climate protection efforts “passive house standard” for new built buildings
11) Installation of environmental zone is introduced in January 2008. This zone spreads across the inner city. Entry barriers are defined according to emissions stemming from vehicles. As such, the introduction is dealt in a successive manner, meaning from the beginning, vehicles of emission group 1 are no longer allowed, increasing annually resulting in a ban for emission group 3 effective from January 2010 on. Estimation of effectiveness: average decrease of 2 µg/m³

The AAQP 2011 provides an overview in which the intermediate goals and connected measures to reach these are presented (Ch. 6. AAQP 2011, p. 24). This overview is used for the goal tree. The measures reflect in the more detailed presentation above.

Goals:

1) Preservation and enhancement of mobility while decreasing environmental impacts.
2) Decrease of emissions of remaining car traffic

Core measures to 1):

1. Promotion of cycle traffic for reaching the 25% target in modal split
2. Increase of attractiveness of public transport
3. Decentralisation of daily used retail establishments “city of short distances”

Core measures to 2):

1. Traffic regulation for high emission vehicles (environmental zone)
2. Stabilize traffic flow by optimising traffic lights
3. Stabilize traffic flow by tempo 50 zones

Supporting measures to 1):

1. Promotion of pedestrian traffic
2. Concepts for parking space exploitation
3. Promotion of carpooling and job tickets (company mobility management)
4. Mobility consultation of new inhabitants
5. Increase amount of parking slots for car sharing vehicles

Supporting measures to 2)

1. Procurement of low emission vehicles
2. Truck diverging concept
3. Redesign of public spaces
4. Offering of ecological driving courses

As can be seen above, the administration in Hanover divided the measures according to traffic and non-traffic related measures. Since it is acknowledged the traffic being the main point of concern, the city has designed a core set of goals and measures integrated in the main policy document for emphasising the importance of such measures. This core cluster provides own goals as well, which are now integrated in the main policy course as intermediate goals. Therefore, the broader measure catalogue is integrated in the compact version for completing the presentation. Measures not relating to traffic are indicated as non-traffic in the last section.

Intermediate goals:

1) Preservation and enhancement of mobility while decreasing environmental impacts.
2) Decrease of emissions of remaining car traffic

Core measures to 1):

4. Promotion of cycle traffic for reaching the 25% target in modal split
5. Increase of attractiveness of public transport
6. Decentralisation of daily used retail establishments “city of short distances”

Core measures to 2):

7. Traffic regulation for high emission vehicles (environmental zone)
8. Stabilize traffic flow by optimising traffic lights
9. Stabilize traffic flow by tempo 50 zones

1.9.1. Traffic flow optimisation in connection with decrease of driving speed

1.9.2. Reduction of driving speed to tempo 40 on Göttinger Street (in connection with noise pollution policy)

Supporting measures to 1):

10. Promotion of pedestrian traffic
11. Concepts for parking space exploitation
12. Promotion of carpooling and job tickets (company mobility management)
13. Mobility consultation of new inhabitants
14. Increase amount of parking slots for car sharing vehicles

Supporting measures to 2)

15. Procurement of low emission vehicles
16. Procurement of low emission vehicles and machines
17. Truck diverging concept
18. Inner city passage ban for trucks above 12 tons (highway toll avoidance drives)
19. Truck traffic guidance concept
20. Redesign of public spaces
21. Low emission road surface if streets are refurbished
22. Street planning and redesign of road spaces (optical street narrowing and trees alongside)
23. Trees along road, increase of plants within city
24. Offering of ecological driving courses

Non-traffic: Measures not matching the above-mentioned core measures

25. Effective public relation measures
    a. Continuously updating internet presence regarding air pollution control
    b. Printing of 350.000 booklets and 1.500 poster made available in public agencies
    c. Information and environmental advices for environmentally friendly mobility in other publications
    d. Information via press, radio, and television
    e. Information events and stands at events
    f. Campaign day “car free Sunday” from 2008 to present
    g. Presentation regarding efforts in Hanover in other German towns, as well as in Austria
    h. Guided city tours “ambient air and noise pollution”

i. Business consultation to motivate formation of carpooling and use of job-ticketing (public transport concept ‘eco profit’)
j. Support associations and unions offering environmental education in schools

26. Climate protection efforts “passive house standard” for new built buildings
27. Installation of environmental zone is introduced in January 2008. This zone spreads across the inner city. Entry barriers are defined according to emissions stemming from vehicles. As such, the introduction is dealt in a successive manner, meaning from the beginning, vehicles of emission group 1 are no longer allowed, increasing annually resulting in a ban for emission group 3 effective from January 2010 on. Estimation of effectiveness: average decrease of 2 µg/m³

Additional remarks:

Policy purpose:

- The examination unveils aspects which can be noted. Again, it is acknowledged, traffic being the main cause of pollution within the administrative district. The specific shares of traffic regarding the different pollutants are indicated above. Yet, the policy’s ultimate goal is not expressed as being environmentally required, or necessary to protect the human health from hazardous impacts, as the problem recognition of motor traffic might suggest. In fact, throughout the whole policy, terms of, for instance, ‘protection of human health’, ‘environmental protection’, ‘prevention of hazardous impacts’ do no not appear in a direct connection with the policy’s purpose. Instead, the execution of European and national obligations is staged as the policy’s main driver. In this respect, the targets of emission thresholds are recognised, but is the purpose for these not directly mentioned or used as a motivation. Merely the accountable authority, the environmental agency, or side notions of being environmentally friendly in measure explanations, provide hints for the policy’s (actual) purpose. As such, the ultimate desire to protect human health and the environment as intended by the EU reappears only as a side notion of the measures applied in Hanover. The main concern is mobility.
- This reflects as well in the embeddedness of the policy. The AAQP Hanover (2011) is embedded as a part in the “Masterplan Mobility 2025” (2011) in which future mobility concepts are regulated. Here, the main driver is, next to the purpose of mobility, not environmental protection and the protection of human health, but noise pollution.
- Another aspect deserving attention is the way the application procedure for a deadline extension by establishing an action plan is dealt with in the policy. Indeed, action plans allow a wider time frame to comply and is the inclusion of such a plan obligatory but is the intention of such a plan

different as applied here. The action plan shall only get into action if the AAQP fails in extreme cases, if all the functioning measures installed before are failing due to extreme, uncontrollable events. Stating that the AAQP will not suffice to function as prescribed by the EU, lets one question the validity of this application. One might suggest reworking the AAQP first, instead of asking for a permission to simply exceed.

- This approach of coping with EU and national obligations reflects in the policy ultimate goals.

Higher ranked policy:

Masterplan Mobilität 2025 (2011); noise pollution policy is main purpose, not pollution

Leipzig, Germany: AAQP Leipzig 2009

Problem:

a) affected population: 514.000 inhabitants, 6.400 inhabitants were affected by 35 times PM 10 exceedance, 10.100 inhabitants affected from NO_x exceedances (p.17)

Goals:

Ultimate Goals:

a) comply with EU targets -Prior policies turned out to be insufficient, therefore, updated ambient air quality standards (as above imposed by EU)
    a. interconnected with self-imposed standards for environment and sustainability – comply with this policy continuously (protection goals (Beschluss Nr. II-561/96 and Beschluss Nr. III-1356/03 in Ch. 2.5 AAQP Leipzig, 2009) assembling of the following areas:
        i. health precaution and well-being
        ii. environmental protection
        iii. protection of resources
        iv. hazardous emissions and indirect environmental impact by the city
        v. public relations
b) integrate action plan for short time exceeding as support for main policy

Intermediate goals:

a) Citizen inclusion, not just notification
b) control anthropogenic environmental influences to an extent that, to best knowledge, no effect on humans, plants, animals, as well as other cultural or material assets are present (ch. 2.5.1, p. 15)
    a. air: in 2015 the following substances shall be lower than prescribed by EU: NO_2= 20 µg/m3, PM10= < 20 µg/m3
    b. mobility: the city intends that all required distances can be managed via walking, by bicycle, or public transport.
        i. Priority for pedestrians, cyclists and public transport over road transport
        ii. Attractive solutions for car-less households
        iii. Commuting solutions via public transport
    c. Local climate: influence local climate to assure heat reduction
        i. preservation of local cooling areas, decrease of hot areas, increase of waters, decrease of overheating and heat accumulation
        ii. Land use: preservation of green areas and increase of such
        iii. Preservation of wind tunnels and thermic air circuits
        iv. Decrease of haze dome
    d. Regional climate: same goals apply for the region in order to avoid shift of causers towards region
    e. Degradation forbiddance and compliance until 2010

Realised or to be realised measures # 1-18 // cluster according to intermediate goals

Measures regulating traffic

1) Street construction
2) Promotion of public transport
3) Update public busses with particle filter
4) Public fleet low emission vehicles
5) Prioritise street surface refurbishment to lower emissions
6) Development of parking system exploitation
7) Continuation of public transport (tram) expansion
8) Increase public transport attractiveness by marketing, business abo, free of charge at big events, carpooling in businesses, regional ticketing, optimisation of s-bahn traffic, promote pedestrian traffic

9) Use 10% of annual budget to renovate and expand pedestrian and cycle traffic
10) Low emission vehicles for public transport and public cleansing
11) Area driving bans if required
12) Introduction of environmental zone
13) Highway traffic bypass system
14) Further modernisation of public transport
15) Hybrid busses for public transport
16) Participation national fonds electronic mobility for public transport busses
17) Participation national fonds electronic mobility for city employee cars
18) Introduction of social ticketing
19) Refurbishment of thrash trucks with low emission particle filters
20) Refurbishment of cleaning machines with low emission particle filters
21) Continue project of car free inner city
22) Promotion of cycle traffic (parking, signs, public relations)
23) Tempo 30 in construction areas
24) Tempo limits on high emission streets if required
25) New computer for traffic guidance
26) Promotion of car sharing concepts
27) Traffic decrease on hot spots plus truck bans

Special and city planning

1) Development of urban forest
2) Façade greening and roof gardens
3) Compensation green spaces for hot spots

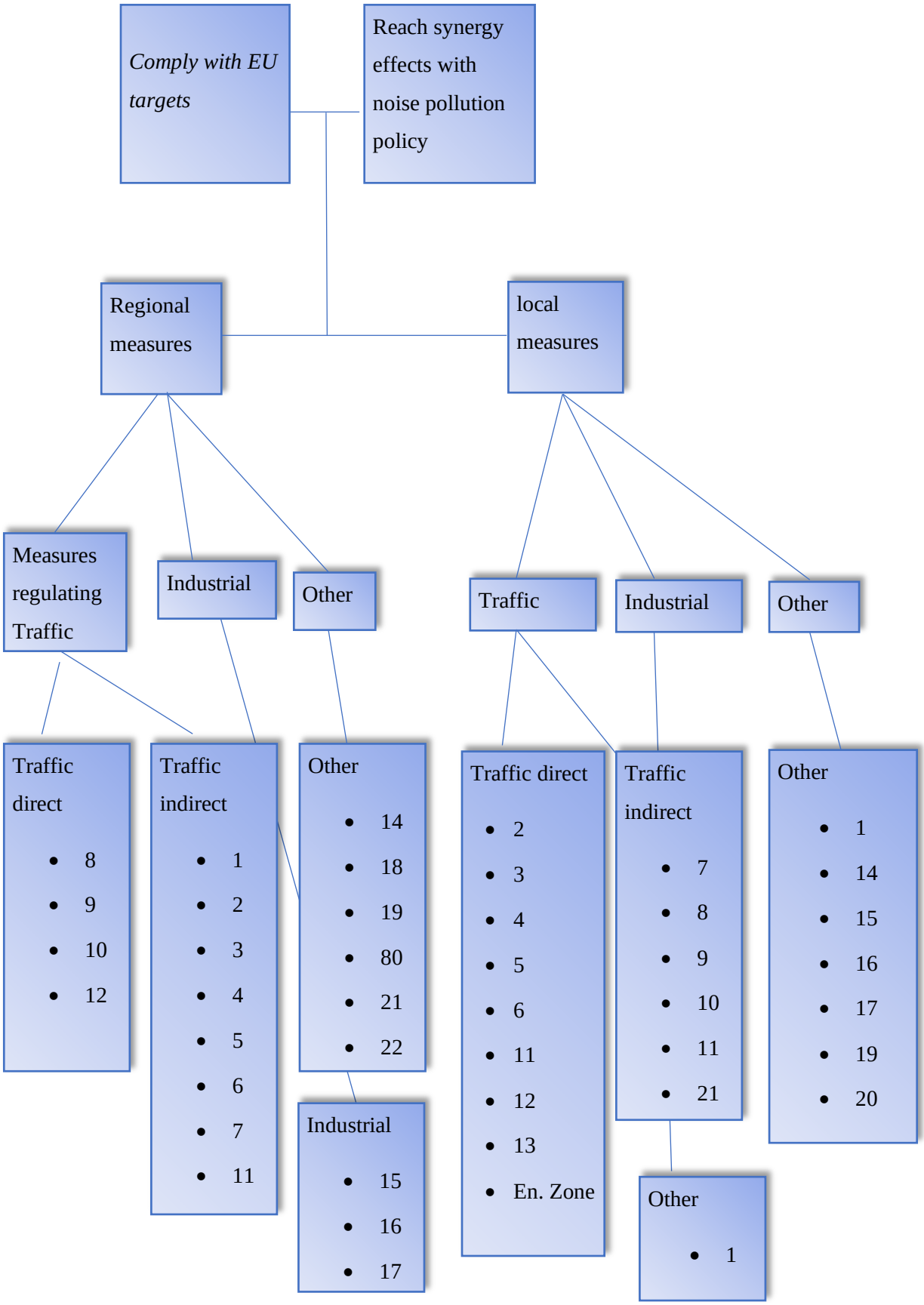
Public relations

1) Intensify public relations in regard of objectives
2) Influence county and national politics to increase pressure for stricter emission regulations for automotive industry and the creation of financial incentives to refurbish private vehicles

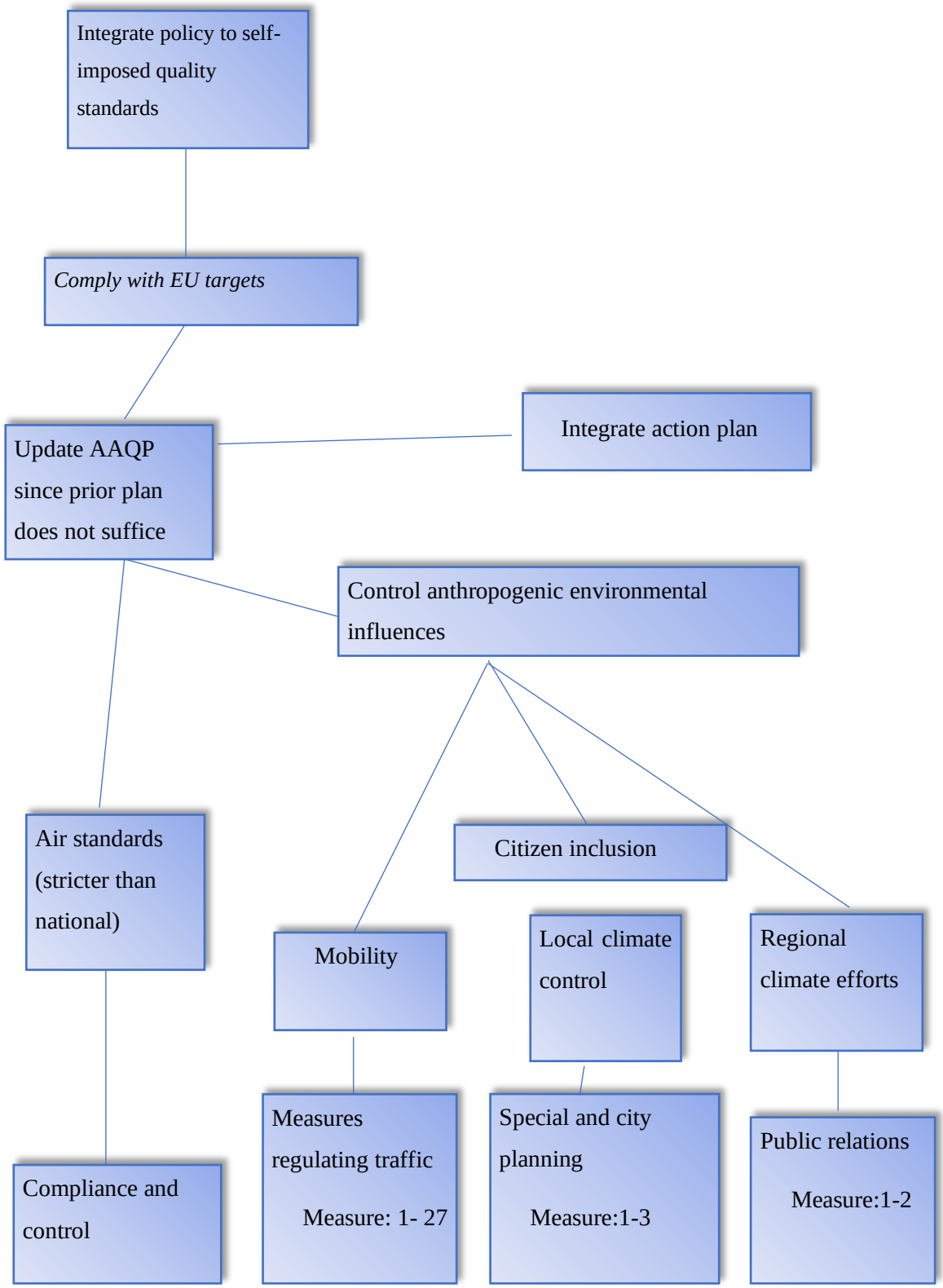
Measure compliance and control

1) Prioritised budget agenda setting for measures at hand
2) Compliance reports to accountable authorities
3) Control of measures effect on air situation
4) Create financial leeway for authorities, if required

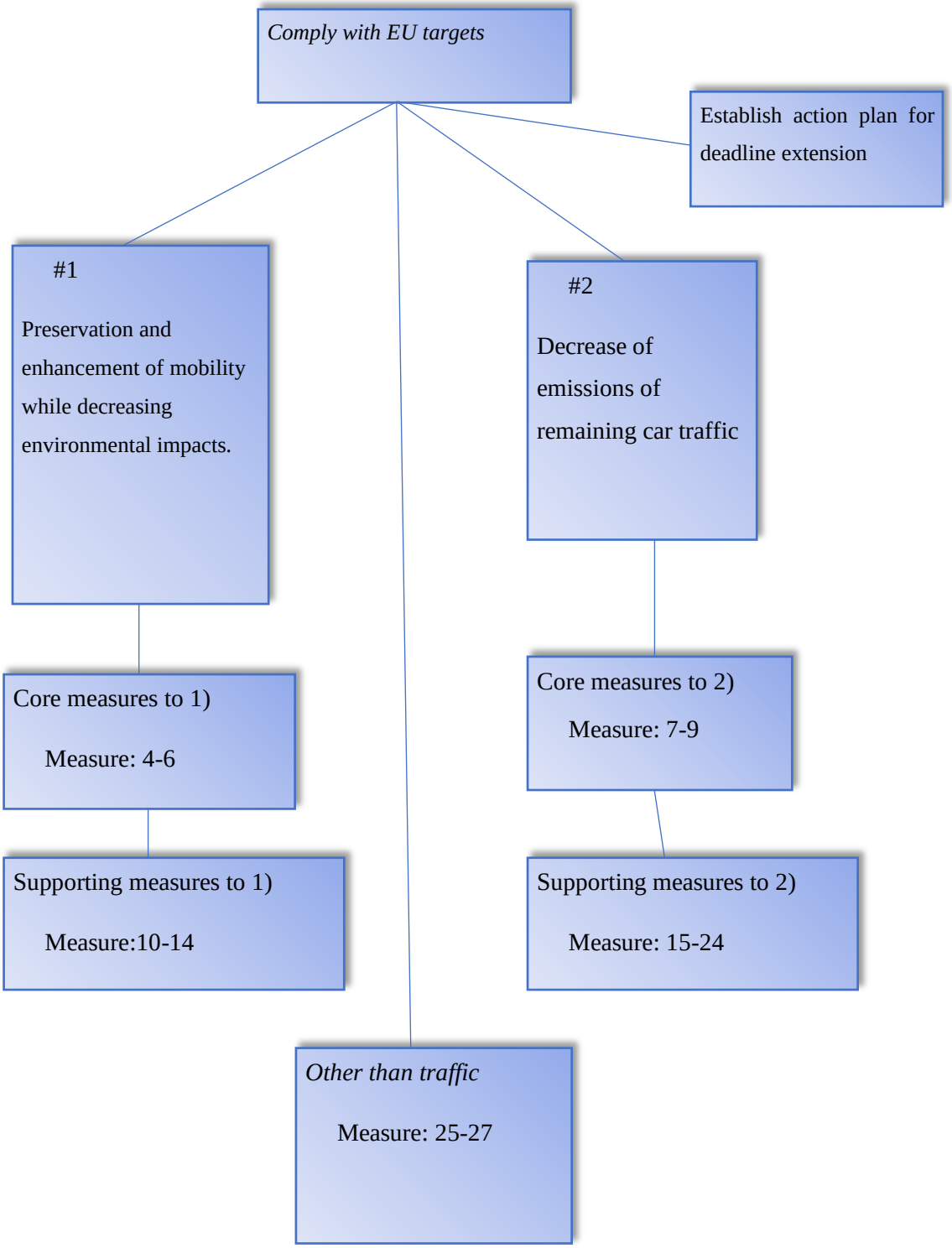
Policy Goal Tree AAQP Essen 2011



Policy Goal Tree AAQP Leipzig 2009



Policy Goal Tree AAQP Hanover 2011



Interview questions

At this point it has been presented what kind of tensions may exist for local policy makers. It is to be answered, why do German municipalities fail to accomplish the targets laid down by the EU despite installed measures? The differences in the policy approaches have been carved out, but which factors inform the end results? As such, the interviews cover procedural aspects of the policy-making and implementation processes. In that sense, it is assessed what burdens and pitfalls may be found the procedural aspects of creation and implementation, and what factors beyond may explain the non-compliance.

General interview questions:

Why is the policy designed the way it is designed?

How can the pollution be justified?

Policy theory "the total of assumptions":

1. The EU aspires a healthy and liveable environment by assuring a good air quality. What hat do you think lies at the root if the goals shall be obtained?
2. What are your motivations when executing the task imposed by the EU?
3. Measures are designed to cope with the problem. How fairly, or in what way do you think the measures refer to the actual problem?
4. By what measure or mechanisms do you take the polluter pays principle into account?
5. What would, in your view, be the most effective measure for meeting the target?
6. Were certain measures excluded in the policy making process?
    a. And if so, what were these measures and what were the reasons for exclusion?
7. Who, would you say, are the most important actors in the process and do these have equal opportunities to take part in influencing the policy-making process?
8. Do you think that the resources used justify the results?
9. What other obstacles, else than mentioned, hinder a more effective policy in your perception?
10. What other factors may explain the non-compliance? Is there, for instance, another policy competing with the goals, or another authority regulating an important objective?
    a. By whom are these factors to be regulated?

11. Did you perceive the problem at time so intense that you would say that it goes beyond the capacities available to you?!
12. Do you perceive yourself in the role as “change agent” or do you believe that the principle of subsidiarity is mistakenly applied here?

Implementation conditions:

1. Were planned measures not implemented? And if so, what were the reasons?
2. How would you describe the support by the implementing agencies? Are forces joined or allies built?
3. Were these consulted in the policy making process?
4. Is there a “problem fixer” in the process, or were measures brought to court?
5. How would you describe the moral amongst the actors involved in the process?
6. How is the measures’ compliance assured? As an example, how do you assure a compliance with the Environmental Zone? Referring to: Do you believe that the measures in theory would suffice, but do they not due to lack of investigation?
7. If a policy fails, which is the case here, the error must be found in either the policy or the implementation. What do you think is the problem for this city?

Other factors:

1. What is the problem with the problem?
    a. In that sense, pollution stemming from traffic. Goals are, despite measures, not met. So, what do you think is the problem?
2. Who creates the ideas for the measures?
    a. Who is accountable for the measures not being more cause-oriented?
3. Are there constraints you experienced?
    a. If so, in which context?
        i. The problem itself, political-, economic-, cultural-, technological-context

Below the e-mail answering the questions in original language. Note, the first section introduces the topic and states a consent to publish the response as it is.

„Die Antworttexte dürfen Sie gerne in Ihrer Masterarbeit verwenden, sofern sie Inhalte nicht aus dem Zusammenhang herausgelöst wiedergeben und diese nicht so verändern, dass die ursprüngliche Information verloren geht.

Kernfrage

"Warum schaffen es deutsche Städte nicht, die Luftqualitätsziele zu erreichen?"

Teilfragen und Antworten zur Kernfrage

Frage:
Woran liegt es also Ihrer Meinung nach, dass die Stadt noch nicht den richtigen Weg gewählt, bzw. das Ziel auf diesem Wege noch nicht erreicht hat? Was müsste man tun, warum wird es nicht gemacht?

Antwort:
Sie nehmen den Luftreinhalteplan 2009 in Bezug. Dabei ist zunächst zwischen der Luftbelastung mit Feinstaub (PM10) und der mit Stickstoffdioxid (NO2) zu differenzieren. Sofern Sie mit Zielen die Einhaltung der Immissionsgrenzwerte meinen, ist festzustellen, dass PM10 in der überwiegenden Zahl der Städte/Ballungsräume kein Problem (mehr) ist. Auch in Leipzig hat sich die Situation gemessen an den Immissionsgrenzwerten der 39. BImSchV deutlich entspannt, vgl. dazu https://www.leipzig.de/umwelt-und-verkehr/luft-und-laerm/luftreinhaltung/messung-der-luftschadstoffbelastung/ bzw. den Luftreinhalteplan für die Stadt Leipzig - Fortschreibung 2018 (www.leipzig.de/luftreinhalteplan).
Anders dagegen sieht es bei NO2 aus. Der Grenzwert für das Jahresmittel der Konzentration dieses Luftschadstoffs konnte in den vergangenen Jahren in Leipzig nicht durchgängig eingehalten werden. Das ist das Ergebnis der messtechnischen Luftqualitätsüberwachung in Leipzig.
Die uns aus der rechnerischen Luftschadstoffprognose vorliegenden Daten weisen aus, dass auch im Jahr 2020 noch bewohnte Straßenabschnitte verbleiben, an denen der Grenzwert für NO2 voraussichtlich überschritten sein wird. Aus diesem Grund wurde der Luftreinhalteplan für die Stadt Leipzig aus dem Jahr 2009 fortgeschrieben.
Das eigentliche Problem der hohen NO2-Belastung in Leipzig sowie vielen anderen betroffenen Städten ist der hohe Stickoxid-Ausstoß der Dieselfahrzeuge - der Diesel-Pkw und leichten Nutzfahrzeuge mit Dieselantrieb. Dies entschärft sich langsam durch die Nachrüstung von Abgasbehandlungssystemen, Software-Updates und die zunehmende Durchdringung der Fahrzeugflotte mit Euro 6 d (temp) - Fahrzeugen.
Das Ausmaß der Dieselproblematik war zum Zeitpunkt der Erarbeitung des Luftreinhalteplans 2009 nicht absehbar. Auch die Umweltzone in Leipzig, welche im Jahr 2011 als erste Umweltzone in Deutschland gleich mit grüner Plakette startete, hatte im Hinblick auf Stickoxide nicht das eigentlich erhoffte Potenzial entfalten können.

Diesem Aspekt wird im aktuellen Luftreinhalteplan u.a. mit verkehrsorganisatorischen Maßnahmen Rechnung getragen, darunter veränderte Abbiegebeziehungen und Fahrspuraufteilungen sowie Maßnahmen der Verkehrsflussdosierung, um das Verkehrsaufkommen in stark belasteten Straßen zu senken.
Der Weg ist damit klar formuliert und die Maßnahmen des Luftreinhalteplans sind entsprechend des gesetzlichen Auftrags umzusetzen.

Frage:
Welche Akteure oder Argumente wirken hinderlich dabei, das Autofahren zu regulieren?

Antwort:
Grundsätzlich haben wir als Stadtverwaltung insbesondere als Amt für Umweltschutz das Ziel, den Umweltverbund zu stärken und den motorisierten Individualverkehr zu minimieren. Die Gründe hierfür sind vielfältig. Aus dem Blickwinkel der Luftreinhaltung geht es um eine Verbesserung der Luftqualität, um die Einhaltung der gesetzlichen Vorgaben zum Gesundheitsschutz und um die Annäherung an die selbst gesteckten Zielwerte der Stadt (Umweltqualitätsziele). Daneben spielt die Verringerung der Lärmbelastung eine maßgebliche Rolle, die Erhöhung der Aufenthaltsqualität im öffentlichen Raum, die Reduzierung des Flächenverbrauchs und das Erreichen der Ziele beim Klimaschutz. Um diese Ziele zu erreichen, gilt es Angebote zu schaffen, mithin attraktive Alternativen zum eigenen Auto zur Verfügung zu stellen. Es geht im Wesentlichen nicht darum, den Kraftfahrzeugverkehr durch restriktive Maßnahmen einzuschränken sondern mit Augenmaß zu agieren und eine geeignete Lösung für alle Verkehrsteilnehmer zu finden. Ein gut funktionierender Wirtschaftsverkehr ist wesentliche Voraussetzung für eine prosperierende Stadt hoher Lebensqualität. Grundsätzlich führt der Weg an einem Umdenken im Mobilitätsverhalten jedoch nicht vorbei. Anreize und Restriktionen können diesen Prozess beschleunigen. Restriktionen sind dort erforderlich, wo der Gesundheitsschutz als hohes grundrechtlich verbürgtes Gut gefährdet ist und andere Maßnahmen nicht schnellstmöglich zum gleichen Ziel führen.
Dies erzeugt mitunter Widerstände, die es im Planungsprozess gilt aufzufangen bzw. auch zu durchbrechen. Widerstand gegen restriktive Maßnahmen im Straßenverkehr rührt meist aus unmittelbarer Betroffenheit der Verkehrsteilnehmer bzw. von Seiten der Interessenvertreter der Wirtschaft. All zu oft werden Bedenken bei einem Vorhaben geäußert, die sich im Nachgang nicht bewahrheiten. Ein Beispiel dafür ist die Umweltzone in Leipzig. Mit deren Einführung wurde bspw. die Wirtschaftskraft als gefährdet angesehen und ein Einbruch in der Tourismusbranche vorausgesagt. Beide Befürchtungen sind aus hiesiger Sicht nicht eingetreten. Im Gegenteil, die Zahl an Übernachtungsgästen in Leipzig ist nach Einführung der Umweltzone ungebrochen weiter gestiegen und kein Unternehmen musste aufgrund der Umweltzone nach unserer Kenntnis Insolvenz anmelden. Ein Schlüssel die unterschiedlichen Interessen zu würdigen bzw. die Beteiligten im Prozess mitzunehmen, liegt sicherlich darin, Überzeugungsarbeit zu leisten und Beteiligungsprozesse auf hohem Niveau zu gestalten, bspw. durch eine frühzeitige Beteiligung der Öffentlichkeit und der relevanten Interessenvertreter..

Frage:
Wie würden Sie die Arbeitsatmosphäre i.d.S. beschreiben?

Antwort:
Die Arbeitsatmosphäre innerhalb der Stadtverwaltung ist kooperativ, gleichwohl ggf. unterschiedliche Auffassungen vertreten werden. Soweit ein bestehender Dissens nicht ausgeräumt werden kann, wird eine Entscheidung unter Würdigung der jeweiligen Argumente im obersten Verwaltungsgremium - der Dienstberatung des Oberbürgermeisters - getroffen.
Ebenso kooperativ gestaltet sich die Zusammenarbeit mit den jeweiligen Landesbehörden, was die Luftreinhalteplanung anbelangt, mit dem Sächsischen Landesamt für Umwelt, Landwirtschaft und Geologie.

Als zuweilen schwierig gestaltet sich die Atmosphäre zwischen der Verwaltung - Planbefürwortern - und Interessensvertretern außerhalb der Verwaltung - Plangegnern. Teilweise ist eine Annäherung oder ein Konsens kaum möglich.

Frage:
Erleben Sie in Ihrer Stadt ähnliche Strömungen? Bäume pflanzen ja, Maßnahmen die das Autofahren selbst tangieren, nein. Die guten Ideen sind da, soweit diese aber Restriktionen mit beinhalten nicht gewollt ("wir wollen keine Fahrverbote").

Antwort:
Das erleben wir in Leipzig ähnlich. Einschneidende Maßnahme (Restriktionen), welche ggf. mit finanziellen Einbußen einhergehen (Neuanschaffung/Nachrüstung Auto) oder ein Umdenken im Mobilitätsverhalten einfordern, sind kaum mehrheitsfähig. Gleichwohl rund 50 Prozent der Leipziger und Leipzigerinnen mit der Sauberkeit der Luft nicht zufrieden sind, sprechen sich nach einer Umfrage rund 60 Prozent gegen Dieselfahrverbote aus. Die größte Gruppe derer die sich ablehnend äußert, umfasst Personen im mittleren Erwerbsalter (45 bis 54 Jahre).

Frage:
Glauben Sie, dass das Problem auf lokaler Ebene zu lösen ist, oder wäre es besser auf nationalstaatlicher Ebene gelöst (in Bezug auf z.B. die blaue Plakette für die Umweltzone, Abgasnormen, Bereitstellung öffentliche Mittel, etc.)?

Antwort:
Zweifellos gibt es Themen, die auf Bundesebene bzw. Ebene der EU besser zu lösen sind. Dadurch, dass das nicht passiert haben die Kommunen oftmals massive Probleme. Ein Beispiel dafür haben sie bereits angesprochen und betrifft die Regulierung bei den Abgasnormen. Daran knüpft sich ein weiteres Thema, welches ebenfalls nicht auf kommunaler Ebene zu lösen ist, die Einführung einer blauen Plakette. Aufgrund der Dringlichkeit der Einhaltung der Grenzwerte insbesondere für NO2 sind die Kommunen vor finanzielle Herausforderungen gestellt, welche sie aus eigenen Mitteln nicht bedienen können. Die von der Bundesregierung geschaffenen Förderprogramme (Stichwort: Sofortprogramm Saubere Luft 2017 - 2020) sind ein wichtiger Baustein, um Maßnahmen auf kommunaler Ebene umzusetzen und damit die Luftqualität zu verbessern. Für die Problemlösung in Bezug auf NO2 ist ein Zusammenwirken der Akteure auf lokaler Ebene, auf Ebene der Länder und der Bundesregierung erforderlich. Die Kommunen haben die beste Kenntnis der Lage vor Ort und können ggf. zwischen verschiedenen Handlungsalternativen wählen (Ermessen). Dazu braucht es allerdings eines finanziellen Backgrounds sowie der erforderlichen rechtlichen Rahmenbedingungen, welche das Land (z.B. durch ein Landesimmissionsschutzgesetz oder Fördermittel) insbesondere aber der Bund bereitstellen muss. Letztendlich tragen die Kommunen die Konsequenzen aus Entwicklungen, welche im Hinblick auf NO2 und die Dieselproblematik zu großen Teilen von Ihnen nicht zu verantworten sind.

Mit freundlichen Grüßen
Im Auftrag
Abteilungsleiter

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Stadt Leipzig, Der Oberbürgermeister
Amt für Umweltschutz
Abteilung Umweltvorsorge”

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