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BACHELOR THESIS

THE POLITICS OF URBAN ENERGY TRANSITIONS - ANALYZING THE 'GREEN CITY' FREIBURG AND ITS POLITICAL ACTORS

LINUS PLATZER

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Summary:

Climate governance is becoming a hot topic on the agendas of cities. As climate change, energy security, and natural resource consumption are pressing societies to take action, cities and local governments are increasingly seen as key agents of sustainability transitions. Yet the scope and speed to which an energy transition takes place at the local scale varies significantly. The main problem identified here is that we do not know well what climate change does to the city and what cities do in response to climate change. One aspect neglected so far are the institutional capacities and the political struggles embedded in the broader economy. In order to understand these aspects of transitions, I will review the literature on urban transitions and climate change mitigation. I then will propose a framework of analysis based on actor-centered institutionalism and assess the urban politics of energy transitions in the city of Freiburg, Germany. Applying a qualitative case study approach, I find several conflicts that indicate opposing actor constellations. Influencing the institutional set-up and decision-making of green building policies, regime change has happened to some extent. This thesis contributes to existing scholarship by exploring the political processes of cities in transition.

Keywords:
Climate change policy, urban governance, energy transition, actor-centered institutionalism, local politics

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1. Introduction

"It is impossible to overstate the importance of global warming. No other issue threatens our planet with such dramatic, far-reaching impacts, and no other issue is so clearly a worldwide problem. At the same time, many of the most promising solutions to global warming are local initiatives that we can control."

Opening sentences of Portland's 2001 Local Action Plan (City of Portland, 2001, page I; cited after Rutland and Aylett 2008, 639)

"Some people really like the *Green City*, but it is quite hard to convince them of the energy transition."

Interview Participant, Freiburg July 2015

Problem Definition

Climate governance is becoming a hot topic on the agendas of cities.[1] As climate change, energy security, and natural resource consumption are pressing societies to take action, cities and local governments are increasingly seen as key agents of sustainability transitions. Yet the scope and speed to which an energy transition takes place at the local scale varies significantly. Some cities are on the frontline, but it is not clear how effective they are and can be. One aspect neglected so far are the institutional capacities and the political struggles embedded in the broader economy (Bulkeley and Betsill 2013; Späth and Rohracher 2014). In order to understand these aspects of transitions, I will review the literature on urban transitions and climate change mitigation. After I then will propose a framework of analysis based on actor-centered institutionalism as developed by Fritz Scharpf and assess the urban politics of energy transitions in the case of the city Freiburg, Germany. By researching this case, I am interested in contributing to existing scholarship and shedding light on the political processes of cities in transition. The main problem identified here is that we do not know well what climate change does to the city and what the city does in response to climate change.

As modern societies are challenged by various threats to sustainability[2], it becomes clear that paths for transitions have to be explored and developed. A *sustainability transition* generally refers to a "radical transformation towards a sustainable society as a response to a number of persistent problems confronting contemporary modern societies" (Grin et al. 2010, 1, cited after Avelino 2011,

1 Confusingly, various terms in the literature such as *low-carbon transition*, *climate governance, energy transition*, etc. are often used interchangeably when in fact they refer to the same content. This happens partly in reflection of the authors' emphases on a certain topic. On the other hand, the strong connection between carbon (CO_2 or equivalent) emissions and energy use is well established (Bulkeley and Broto 2013, 98). In the end I chose the term 'energy' for practical reasons, e.g. 'energy transition' is the most familiar term for most people.

2 I refer to the definition of the so-called *Brundlandt Report* (World Commission on Environment and Development 1987).

3). To govern these transition processes the approach of *transition management* has been developed. Despite its dynamic character, it reveals several flaws, asking for alternative approaches to transitions. Such a model should especially account better for a governance perspective towards political conflicts and the interaction of actors and institutions. As local governments, city councils, citizen groups, and other stakeholders are taking action to address of climate change, further insight on their effectiveness, the drivers of action, and the relationship between niche actors and institutional set-up are required. The city of Freiburg, deemed a frontrunner in environmental policy within Germany, is a promising case for scrutiny as studying ambitious cities can showcase both potential and limits of transitions.

Research Objectives

With this thesis, I pursue several research objectives. First, the activities of cities dealing with climate change are not explored sufficiently. As climate change rose visibly to the public agenda within the last two decades, policymakers and researchers have taken up the concern, yet much remains unclear. The configuration of urban governance and the prospects of to what extent 'acting locally' can be successful in this policy area provide a research gap. I attempt to contribute to the growing interdisciplinary research on transitions by specifically addressing the political nature of urban energy transitions.[3] Second, by looking at how municipal units of government and local civil society react to and approach the perceived dangers and opportunities of climate change, research can make a contribution to democratic governance and improve the functioning and legitimacy of democracy in Europe. Third, energy transition is a term coined by public research institutions and social activists which in the meantime has diffused into mainstream language. Finding out about the development of transition approaches both in the literature and applied to the city can offer significant insights into how social change takes place.

Having had the privilege to study at both a Dutch and a German university, I wanted to integrate both perspectives for my bachelor's thesis in what I ultimately consider Political Science. Luckily, I was able to combine my focus on political economy and environmental politics and research experience in Muenster with my schooling at a more governance-oriented program in European Studies and a minor in Sustainable Development at the Department of Technology and Governance for Sustainability in Twente. I chose the focus of my thesis after having done previous research undertaken in the Senior Seminar at Hastings College, Nebraska/USA in Spring 2014. Comparing European experiences with renewable energy deployment, I there preliminary had confirmed my hypotheses that local actors influence local energy governance, and that municipalities are decisive

3 This research includes approaches as diverse as transition management, technological innovation systems, strategic niche management, grassroots innovations, multi-level governance, political ecology, and political economic approaches, dealing with sustainability transitions. (cf. Hansen and Coenen 2014).

local actors. Following up on the task in this thesis, I researched to what extent institutional factors and actor networks impact and structure the actors' ability to influence energy governance.

Research Question

My research question is as follows: What role does political agency play as a factor in urban energy transitions in the city of Freiburg? I chose my research question after a first review of the literature. Many authors indicate that factors such as the "micro-politics of socio-technical transitions" (Späth and Rohracher 2015, 274), and "urban politics of energy transitions" (Rutherford and Coutard 2014, 1369) need to be understood better.[4] As climate change rises on the political agenda due to its urgency and intersection with other sectors such as transport, housing, energy, and industry, it is possible that "climate politics may very well develop from a consensual to a more conflictual political field" (Kronsell 2013, 7). In fact, energy supply already is "a heavily political issue and subject" (Rutherford and Coutard 2014, 1370). Accordingly, subquestions include: What overlap does exist between urban climate governance and transition studies? To what extent are local actors able to influence the transition process? What political conflicts can be identified? How can a neo-institutionalist approach be made fruitful for analysis of urban transitions?

Initial Assumption for Research

I base my research on the main tenet of recognized climate change scholar Harriet Bulkeley: „More often than not, it is the urban political economies of climate change that matter most in enabling and constraining effective action" (Bulkeley 2010, 244). According to Bulkeley, there exist two main factors for making successful transitions at the urban scale: 1) the opportunities for leadership, facilitated by specific event triggers and windows of opportunity on the one side, and 2) the ability and political strategy of municipal actors to take on climate change as a local challenge on the other side (Bulkeley 2010, 244-245). Yet, reviewing the literature, I found that the research on urban transitions often either contained abstract reflections or under-theorized case studies. Following the recommendations of Hoppe and Van Bueren (2015), my ambition was to further understanding by addressing the multiple roles of cities, the practices of design and implementation, the institutional conditions, and lines of conflict between actors (cf. Hoppe and Van Bueren 2015, 8). The focus was put on developing a sufficiently conceptual-theoretical approach.

Structure of the Thesis

I start out by reviewing the literature on cities and climate change. After having outlined policies, barriers and actors in urban climate governance, I turn to theoretical accounts of energy transitions. After reviewing current approaches critically, I will elaborate the framework of actor-centered

4 There might be a certain national-disciplinary bias when it comes to choosing a research perspective. I hypothesize that German political research has comparatively focused more on the role of state institutions than has its Dutch counterpart, since they have experienced the state's ability to deliver effective climate-related policies differently (cf. Jahn 2014, 101).

institutionalism in the third section. Here I will also construct my hypotheses and variables. The methodology is addressed in the fourth section. Following, I will outline the recent development of the city of Freiburg and analyze the role of political actors and institutions in green building policies. Finally, I will discuss my results and the hypotheses before I answer my research question.

2. Review of the Literature on Urban Climate Governance and Low Carbon Transitions

In the last decade, scholarship has spawned a growing literature on cities and climate governance, contributing to a new research field (Bulkeley 2010). It is embedded within the broader research strand of environmental governance, which draws expertise from many disciplines. Interdisciplinary in nature, urban climate governance research is best integrated with related fields of socio-technical transitions, sustainable development, economic geography, urban studies, and global environmental change (Bulkeley and Betsill 2013; Geels 2011; Hansen and Coenen 2014; Hodson and Marvin 2010; Kern and Alber 2008). In Section 2.1, I will review some of the empirical and policy-relevant insights on the topic, and then I will transition to a discussion of the different research approaches in Section 2.2.

2.1. The Growing Action on Climate Change by Cities

Cities worldwide are starting to address climate change in their policies. Cities are a central aspect of low-carbon transition because they contain more than half of the world population. With high population density, high economic contribution to national budgets, and massive transportation to suburbia, urban areas account for around 70 % of energy use and emissions today (Global Commission on the Economy and Climate 2014, 28).

Policies

As many cities pursue strategies to reduce their environmental impact, cities especially in the Global North[5] follow similar concepts. Many have come up with targets to reduce carbon emission by 25% over the next decade (UNEP 2011). These targets are embedded in action plans including various measures for climate change mitigation, adaptation, and socio-economic co-benefits.[6] Various labels for these policies include 'climate action', 'low-carbon development', 'environmental

5 There is an inherent focus on high-industrialized societies in this paper (cf. While et al. 2010; Victor 2011). Evidently, they are the ones disproportionately responsible for global emissions which makes focusing on high-consuming elites expedient (Dodman 2009) Moreover, especially in the cases in the Global North, adaptation to climate change is less regarded than mitigation (Hoppe et al. 2014). Accordingly, the reviewed research focuses more on these mitigation activities.

6 Millard-Ball (2012) questions whether these plans actually help reduce environmental impact or whether they mainly mirror pro-environmental attitudes that have helped bring down emission.

protection', 'sustainability efforts', or 'green policy' labels.

According to Kern et al. (2005), municipalities can play various roles in local climate protection: Thye serve as consumers and rolemodels, as planning and regulatory authorities, as supplier and provider, and as consulting agency and educator (cf. Rave 2014, 12). In the most visible cities, one can observe a focus on the energy and building sectors as major contributors to potential carbon reductions (Bulkeley and Broto 2013; Aall et al. 2007). Depending on the willingness to engage with citizens, cities have also experienced a rise in participatory urban planning (Seyfang and Haxeltine 2012; Anguelovski and Carmin 2011). Arguably, a bottom-up, "multi-level learning process uncovers a host of co-benefits" (Klingenfeld 2012, 15) and prepares the ground for more effective top-down options. City governments also increasingly set regional agendas, market their leadership, and share their experiences in transnational networks such as the *C40 Climate Leadership Group* and the *ICLEI- Cities for Climate Protection* (Lee 2013). Additionally, many cities participate in market-based mechanisms such as carbon markets or carbon credit programs (UNEP 2011). In general, most policies follow the paradigm of ecological modernization which sees growth and environmental protection as reconcilable (While et al. 2010). While Bulkeley (2010) has criticized this tendency, she also notes how strikingly different cities are in trying to tackle climate change issues.

This is relevant, since until recently, cities and local governments were not even considered legitimate actors in climate governance (Anguelovski and Carmin 2011). The shift to a lower level can be at least partially attributed to the widespread failure of international negotiations and national policy agendas in the past to deliver more comprehensive plans (Hoffmann 2011). As a consequence, new approaches have proliferated since the 2009 conference in Copenhagen. The burden to prevent dangerous global warming has been at least partly put upon cities in order to act more swiftly and in a more effective way. Now in the Post-Copenhagen world, it seems local governments are viewed as legitimate and effective actors (Wolf 2013). Yet the ambitions of cities play out very differently. While some see it as an opportunity to advance their innovative ideas in the absence of more commitment on a larger scale (Schreurs 2008), others only slightly modify business-as-usual scenarios. The diversity of policy prescriptions is huge which makes it essential to examine the institutional base of these programs. (Bassett and Shandas 2010).

Barriers

Despite cities becoming more proactive, tackling climate change at the local level incorporates certain barriers (Burch 2010; Weible and Elgin 2013). Margolis and Zuboy (2006), in an early analysis of barriers to implementation and use of energy efficiency (EE) and renewable energy (RE), identified main non-technical barriers such as lack of government policy supporting EE/RE,

difficulty of overcoming established energy systems, and failure to account for all costs and benefits of EE/RE". Reviewing Betsill (2001), Weible and Elgin identify three specific barriers for local policy: "uncertainty related to the institutional home for climate policymaking; lack of capacity to develop climate policies and programs and to oversee, monitor, and analyze carbon emissions; and deficient commitment to investing financial resources to address climate change" (Weible and Elgin 2013, 164). In addition, Anguelovski and Carmin (2011) remark that local sustainable governance is not solely dependent on large-scale national climate policy efforts, but also happens in the pursuit of internal goals. They discover several selective incentives for cities to undertake environmental action such as green building development or cost reductions. Alike, they assess financial incentives as primary reason for mitigation efforts, whereas perceived vulnerability and the demonstration of exemplary commitment are key motivations for adaptation. But certainly, contextual factors have to be complemented by institutional and functional factors such as the way city management is organized (Hoppe et al. 2014). Local governments have been mostly on their own in developing an inventory of programs and institutions for climate protection by, for instance, employing partnerships between civil society and government or establishing new offices (Anguelovski and Carmin 2011).[7] In sum, there are many barriers individual actors face. Certainly, action beyond clearly defined boundaries such as in urban climate governance triggers many new challenges, adding to the collective action problem of climate governance.

Who is Acting in Cities?

Municipal authorities are decisive in climate policy-making: Research surveys suggest that in two of three cases urban climate actions are undertaken by the local governments, with the remainder left to federal or regional governments, civil society, and private industry (Bulkeley and Broto 2013, 99). Accordingly, the focus of analysis has often been on city leaders, trying to understand their methods and efforts to address climate change locally. Block and Paredis (2013) count the strategic use of power by the mayor as a major factor for a transition in urban development projects, in accordance with the importance attributed to municipal leaders in the literature (Burch 2010; Norn 2014; Hoppe et al. 2015). Looking at actors as policy entrepreneurs continues to be valid: "The uptake and implementation of local climate policy was to a significant extent related to this so-called personal factor, since uptake and policy making relied heavily on the political will and power of a few to act" (Hoppe et al. 2014, 4). On the other side, local climate policy has always experienced support by local civil society organizations as well (Blanchet 2015; Späth and Rohracher 2011). Experts in networks, participative planning, and collaborative approaches have also shaped urban governance (Khan 2013). These previous studies indicate that local actors are relevant, but are far from having the single responsibility: "In order to overcome the constraints of

7 Although cities that are members in translocal and transnational networks evidently fare better (Lee 2013).

administrative structures, party politics and political timetables, […] a broader institutional capacity for climate protection is necessary" (Bulkeley 2010, 235). Concluding, it is important to distinguish among urban actors and their role both empirically within their respective context and in theory.

2.2. Theoretical Accounts for Urban Climate Governance and Transitions

How and where policy change comes from is debated controversially among theorists. Many authors posit "urban areas as key sites" (Bulkeley et al. 2011, 32) for the governance of sustainability and the reduction of greenhouse gas emissions. Recapping several theories of policy change such as and their specific foci, they note a contrast between the more sociologically-oriented grassroots innovations and a more governance-oriented approach of transition management (TM). More recently, some have also reviewed cases that "point to the highly political nature of these processes" (Bulkeley et al. 2011, 36). Bulkeley and colleagues (2011) in their book cover questions regarding the role of government and the relationship on several levels, calling upon more research to account for the politics of experimentations and strategic interventions. Some researchers outside the transition studies approach use 'experimentation' to describe the new ways climate change policies are being developed. Both public intervention in untraditional areas and participatory approaches are common ways of urban climate experimentation (Bulkeley and Broto 2013).

Grassroots Innovations

Paying more attention to different theories and frameworks of socio-technological change, Seyfang et al. (2010) describe the research agenda for civil society engagement in sustainability transitions through the well-elaborated concept of grassroots innovations. Taking the *Transition Towns* movement as an example, they conceptualize the (energy) transition in a social movement context. In another paper, they empirically assess the role of intermediaries and argue for a high importance of bottom-up processes (Seyfang et al. 2013). It becomes apparent that the contributions of the grassroots innovations literature are valuable for transition research since they include the many facets of the transition process - sociotechnical, social-participatory, political, technical-economic, and socio-ecological - better than traditional policy approaches. Turning to the role of grassroots actors, environmental groups can also contribute to local governance and, in the end, effectively influence legislation. Many cases – including the example of the *Schoenau Electricity Rebels* (Stromrebellen Schönau) or of Colorado's wind energy policy -- show how groups originating in a social movement structure can block or lobby the main energy provider and the regulating authorities to achieve success (Rave 2014; Doblinger and Soppe 2013). In the latter case citizens campaigned and ultimately voted for state legislation which helped to institutionalize renewable energy policy. McCright and Clark (2006) find that the structures of social movements at the local

level can be decisive if used effectively. It is important to note that local actors can employ strategic agency, e.g. by involving a broad coalition of actors and identify positive-sum incentives for change.[8] Although social movements play a role in shaping the broader city agenda, their tactics and confluence with other interests are not a focus of the research.[9]

Transitions Management

Transition management (TM) is a governance approach dealing with fundamental socio-technical changes. It was developed in the Dutch context first as a historical analysis of innovations in subsystems, influenced by science and technology studies. The goal is to influence the speed and direction of these transformations in society (Rotmans et al. 2001; Rotmans and Loorbach 2010; Geels 2011). A sustainability transition is generally defined as "radical transformations towards a sustainable society as a response to a number of persistent problems confronting contemporary modern societies" (Grin et al. 2010, 1). Many authors in TM operate with the multi-level perspective (MLP) which "capture[s] the dialectical relationships between micro level actors and macro level structures" (Seyfang and Haxeltine 2012: 383; cf. Geels 2004; Grin et al. 2010; Frantzeskaki and Haan 2009; Schneidewind and Scheck 2012). This perspective understands transition as an interacting process between technological niches, socio-technical regimes, and exogenous landscapes on different levels (Moss 2014). I will not cover the detailed workings of TM since it is done elsewhere and I will depart substantially from this framework.

Strategic Niche Management

Related to TM, yet with another focus is the perspective of *Strategic Niche Management* (SNM). Here the focus is on the upscaling of niche experiments to destabilize the incumbent regime. A valuable introduction is presented by Raven (2011) who analyzes niche experiments that attempt to bring about a sustainable energy transition. Niches are protected spaces that at the beginning shield their innovative projects against competitive pressures from outside. From this position, niches can start to influence the regime. Loorbach (2010) points out to the long-term processes taking place in the TM cycle: Changing a regime requires strategic thinking, tactical and operational activities and reflexive evaluations on the way from a niche experiment to an established niche. Jacobsson and Bergek (2004) analyzed how the formation and evolution of new technological systems like renewable energy technology feature positive experiences and barriers alike. With respect to the upscaling of a specific technology, they give early attention to the "formation of "political networks" with the objective of shaping the institutional set-up [as] an inherent part of this

8 In the case that local environmental groups stand *against* change, their success is more unlikely and, throughout the literature, the *NIMBY* (not in my backyard) phenomenon seems outdated (Walker and Cass 2007). Local opposition groups to e.g. wind power seem to have little connection to higher levels and are therefore less influential in forming powerful alliances (Breukers and Wolsink 2007).

9 See for example Sine and Lee (2009).

formative stage" (Jacobsson and Bergek 2004, 9).

Bringing agency back in, Seyfang and Haxeltine (2012) focus on local actors as agents of sustainability transitions. These agents develop first in niches, from which they can diffuse their alternative policy innovations into the dominant regime. Communicating and cooperating more with resourceful regime actors is one possibility to induce change. But this coordination bears the danger of losing their innovative potential and delivering their innovation to the incumbent actors. Research on local transitions has recently called attention to this problem: "Another challenge that is familiar to TM literature but to which TM in local communities adds a new dimensions concerns cooperation with the regime without getting co-opted" (Spekkink et al. 2013, 14). Whether cooptation happens or not, accordingly, depends on the internal capabilities and external circumstances for niche agents. Doci et al. (2014) begin a systematic distinction between heterogenous transition initiatives, differentiating between externally oriented niche actors seeking to change the regime and internally oriented initiatives that at the same time embrace a broader, more holistic model of transition. This, however does not provide further insight on how regime change is induced. While the authors are reasonably cautious of upscaled initiatives, they are too optimistic and simplistic in their estimation of the potential of involving powerful incumbent actors and co-shaping institutional settings. Against them stand the fundamental insight that a whole societal system is locked into a carbon economy (Unruh 2000). Referring to the debate on the *Green Economy*, it is essential to keep in mind that it is often incumbent political actors that participate in and frame new transition processes (van den Bergh 2011; Genus 2014; While et al. 2010). In order to scale up local sustainable development, it is therefore equally important to zoom in on the institutions and political actions inducing change – especially when overcoming or circumventing regime resistance.

Critique of Transition Management and Political Analyses of Change

The TM approach is attacked by more critical researchers who argue that transition management accounts, in contrast to reality, tend to over-emphasize coordinated and consensual transition and neglect the conflictual character of processes of political change (Smith and Stirling 2010; Lawhon and Murphy 2011; Geels 2014; Rutherford and Coutard 2014; Hess 2014; Späth and Rohracher 2014; Moloney and Horne 2015). Additionally, these approaches put too much emphasis on substitution through technological change and the side of producers (Quitzau et al. 2013; Lachman 2013). For instance, Avelino (2011) elaborates how power is an element in transitions too easily forgotten in her analysis of Dutch mobility projects. This expectation towards a governed transition as an orderly process might not be true.[10] Critical researchers claim that the "ambitions of the

10 Swyngedouw (2009) and Mouffe (2005) claim that such ideas even are detrimental and just a disguise of a certain post-political ideology.

transition management approach appear to be exaggerated" (Späth and Rohracher 2011, 104). Taking the examples of Freiburg and Graz, they find that urban transitions happen more as a kind of pressure group approach outside of the administration which has not transcended into mainstream city headquarters. Increasingly, transition scholars themselves seem to become more conscious of this gap. Considering questions of who governs, to whose benefit, and where transitions play out, they acknowledge that future research needs to pay more attention to to power, politics, and processes of regime-change (Smith and Stirling 2010; Loorbach and Verbong 2012). This especially is true as the transitions under study move to the next level: "The bridging between the emerging frontrunners, visions and experiments on the one hand and established interests, powers and institutions on the other seems to have been at the heart of the acceleration phase, implying that transition management *for this phase requires a new toolbox*" (Brown et al 2013, 716; own emphasis). For this reason, Joergensen (2012) has proposed the concept of an "arena of development" to recognize actor conflicts and multiple transition pathways (cf. Ostrom 1990).[11] He also challenges the landscape aspect in MLP, noting that agency happens on all levels (Markard et al. 2012).

How to account for the politics of transition? To begin, focusing more on the actors in their context can help. Looking at the role political actors have played in studies of urban low carbon transitions, Rutland and Aylett (2008) describe how the municipal government in the city Portland, Oregon (U.S.), pushed by certain interest groups, used facilitative power and interacted strategically. With the insight that voluntary measures were insufficient for energy and climate but direct regulation was in contrast seen as politically unviable, the authors highlight the political power which is usually hidden in the planning process. They show a case where to a certain degree bottom-up activism is more subtle than what most activists would assume. And what legitimacy does it have? Kronsell (2013) analyzes the input legitimacy of municipal transition governance through the components of representative electoral politics and deliberative citizen engagement. She finds that, despite a high degree of agreement with the policy output among its citizens, decisions are dominated by elites.[12] Khan (2013) raises a similar concern with respect to elites: in functioning network governance setting without any legitimate bottom-up input, the dominant actors can maintain unsustainable practices in their closed circles. Measuring the success of transitions is a complicated issue. While classical indicators in energy or low carbon transitions are installed capacity or reduced greenhouse gas emissions (Hoppe et al. 2015, 1908; cf. Breukers and Wolsink 2007), transition research also aims to account for a "more processual and contextual view of effectiveness and 'successfulness'" (Hodson and Marvin 2010, 483).

11 This is different from the prescriptive notion of transition arenas in TM (cf. Avelino 2011, 50).

12 One might link analyses of legitimacy to Ostrom's (1990) work: The novelty of her research is that she empirically proved that in certain situations 'community governance' can be superior in both input and output legitimacy.

An institutional perspective is taken by Monstadt (2007) who assesses how institutional change is brought upon in the city of Berlin. He indicates that transition processes and new modes of governance are challenged by the institutional structure in which they take place. This fundamentally points towards the problem of incumbent interests in nested institutions (Tsebelis 1990). Due to path dependency, rational decisions are hindered by established actors. To break up the gridlock, it needs policy entrepreneurs who exploit windows of opportunity (Mintrom and Norman 2009). In Berlin, transition efforts happened simultaneously to a fiscal crisis.[13] In later articles, Moss (2014) and Blanchet (2015) also cover Berlin and the political struggles undertaken by participating actors. Far from being successful, local actors nevertheless managed to provide countervailing power and an alternative vision of an energy transition. Yet is this in contrast with the widely-claimed notion that municipal public leadership plays a crucial role (Hoppe et al. 2015; Block and Paredis 2013; Schwartz 2014; Burch 2010; Bulkeley 2010)? Hess (2014) shows how coalitions of actors put the advocates of transitions against the resistors from the incumbent industrial regime and their allies (cf. Sabatier and Jenkins-Smith 1993). In coalition theories, the convergence of specific layers of beliefs are important for successful cooperative policy entrepreneurship. Cheon and Urpelainen (2013) analyze the case of renewable electricity and find that political leaders can align with one side until the other becomes to strong. But even if that comes true, shared goals cannot avoid the difficulty of establishing a consensus about the policy instruments (Szarka 2010; Hajer 1995). Hence, municipal leaders, in theory, can be found on both sides, but also have to serve their constituencies.

Overall, what remains from this literature is an air of disciplinary uncertainty. Accordingly, discovering the topic of transitions, there are still significant gaps which deserve revision before moving on to study empirical phenomena more intensively. Since the conclusions have remained fragmentary in this field, I would like to bring in more clarity and structure through my research. On the one hand, the theoretical literature offers useful, clearly distinct, and guiding approaches, but on the other hand they still need to be applied to look at real-world phenomena like urban politics in a specific case. From a related field, Bulkeley and Betsill (2013) offer many recommendations for dealing with the urban politics of climate change. While zooming in on cities, they also argue against a strictly localist agenda as proposed by environmental thinkers such as Niko Paech or Bill McKibben (cf. McKibben 2007; Paech 2012): “Any such ‘localist’ framework would obscure not only direct lines of investment and influence, but the broader political economies of which urban responses are a part” (Bulkeley and Betsill 2013, 7). It remains open how the broader political

13 The historical contingency of transitions is also emphasized by Parto: “A transition may be accelerated by one-time events, such as a war or large accidents, e.g., Chernobyl, or a crisis, e.g., the 1970s energy crisis” (Parto 2003, 14). In the policy literature, Karapin (2014) shows how the exploitation of certain macro-level policy windows (i.e. European integration and German unification) prepared the path to the German energy transition.

economies can be accounted for in empirical work. Hence it seems that many mainstream ways of engaging social sciences and theories of social change with climate change policy are at least flawed, or doomed to fail, as Shove (2010) argues. She compares policy-as-usual with themes from the transition literature and calls for more alternative approaches than just focusing on the standard ABC - "attitude, behaviour, and choice". This does not completely apply to transition management, yet the tendency to turn into policy-as-usual prevails. While in the grassroots innovations literature, change is supposed to happen through experimentation in niches, transition management merely acknowledges this niche experimentation in principle and assumes a more ordered process with top-down elements to govern the scaling of niches. I cannot settle the larger questions of more detailed differences and their implications here. On the other hand, I did not feel comfortable with adapting frameworks that seems unsatisfying for my analysis. Therefore, an institutionalist perspective which includes the interdependent actions of strategic actors constitutes an improvement since it can better integrate institutions, politics, and actor constellations. With this, I rather intend to contribute to clarifying and expanding the tools of analysis than testing a concept. I will come back to this in the next sections.

3. What Drives Political Action – Presenting a Framework for Analysis

3.1. Institutionalism and Transitions

The new institutionalist paradigm in political science goes back to the idea that "institutional variables are central in the explanation of political action" (Radaelli et al. 2012, 538). Institutions are, according to prominent thinkers of new institutionalism, "relatively enduring collection of rules and organized practices, embedded in structures of meaning and resources that are relatively invariant in the face of turnover of individuals and relatively resilient to the idiosyncratic preferences and expectations of individuals and changing external circumstances" (March and Olsen 1989, 4). Most (neo-) institutionalists believe that political systems, political actions, and political outcomes can be understood and improved not by focusing on rational actors or cultural values alone, but rather by seeing institutions as guarantors of a logic of appropriateness for their subjects (March and Olsen 2008). In short, institutions are the *rules-on-paper* and *'rules-in-use* that structure, constrain, and enable the way individuals act and interact (Ostrom 1990). Different classifications of such rules abound, sometimes distinctly including or excluding formal organizations, cognitive frameworks, historical and cultural norms, legal requirements, or financial incentive structures, among others (Nilsson et al. 2011, 1119). They guarantee stability, make future

development easier to expect, but can also lead to lock-in and path dependency (March and Olsen 1989; Pierson 2000). On the other side, institutions are not eternal constructs of mankind, subjecting them to alteration, change, destruction over a certain time period. Rules are (re)constructed by political actors seeking to apply them in varied political settings and reformulating them to shifting circumstances (March and Olsen 1989). They also can be triggered or accelerated by specific events or exogenous shocks like the rise of climate change on the public agenda (Nilsson et al. 2011; Karapin 2014). Nonetheless, incremental change or conditions inside institutions can also lead to transformations over time without necessarily being under attack from outside (March and Olsen 2008).

There are also several criticisms advanced against new institutionalist research, among them the lack of explaining mechanisms to determine the influence of institutions, the determinism attributed to them, the classificatory work of forcibly putting policy components into pre-assigned boxes, and the confusion of policy-level variables with institutional variables. While they are certainly valid objections, they more frequently apply to the practice of empirical research than to the neo-institutionalist foundations (Radaelli et al. 2012). Institutional analysis can improve studies of policy change significantly, and are valuable to transition studies as well. Referencing Kemp, Schot, and Hoogma (1998), Parto defines a transition as a "transformation process through which a new technological regime is established" (Parto 2003, 2). In transitions, complex systems reorganize and evolve over long time into a new state of a dynamic equilibrium, with consequences for subsystems. The theoretical background of transitions has been explained better and more in depth elsewhere, it remains to state that institutions are relevant for the development and condition of the different stages of transition in the subsystems (Parto 2003; Rotmans et al. 2001; Geels 2004). While transition management has some foundations in institutional theory, this literature can profit from paying more attention to institutions and politics (Geels 2014). Here as well, the goal should be "improved understanding of the processes that translate political action into institutional change, how an existing institutional order impacts the dynamics of change, and what other factors can be decisive" (March and Olsen 2008, 15).

3.2. Actor-Centered Institutionalism

Since its development within the new institutionalism, the actor-centered institutionalism (ACI) has been mostly used in qualitative case studies to evaluate past policies and decisions. I choose this approach because I believe it can help conceptualize the political agency undertaken by actors in urban energy transitions.[14] Empirical researchers from the Max Planck Institute for the Study of

14 In contrast to Ostrom's more evaluative *Institutional Analysis and Development* framework, the ACI pays more attention to an analysis of institutional influences on potential outcomes (Ostrom 2011; Krekeler and Zimmermann

Societies in Cologne first applied ACI in national policy field research, and at a later point in in research on European multi-level policy (Treib 2015, 291). At the same time it has found use in local case studies (Kriesi and Jegen 2001; Lowndes et al. 2006; Puetz 2011; Dupas 2009), which makes it a good and interesting fit fit for my research. Particularly, urban politics have been analyzed frequently through neoinstitutionalist theory (Davies and Trounstine 2009). In this section, I will first present the framework of actor-centered institutionalism (ACI), explain how it can be applied usefully to my research, and modify it to account for the "fundamentally political character" (Bulkeley et al 2011, 37) of urban low carbon transitions.

Fritz Scharpf has, often together with Renate Mayntz, applied a modified version of rational-choice institutionalism to analyze what he calls "interaction-oriented policy" (Scharpf 2000b):

> "It treats institutions as one set of factors affecting the interactions among policy actors, and hence the greater or lesser capacity of policymaking systems to adopt and implement effective responses to policy problems. [...] Actors and their interacting choices, rather than institutions, are assumed to be the proximate causes of policy responses whereas institutional conditions, to the extent that they are able to influence actor choices, are conceptualized as remote causes" (Scharpf 2000b, 3).

Rather than a fully elaborated theory which produces concrete hypotheses, the ACI is rather a research heuristic to explore the interactions of actors in relationship to institutional constraints (Treib 2015, 277). Institutions are, according to ACI, both formal rules and social norms. Common feature is their structuring of the behavior of actors. In general, collective actors are manifold, from unions over clubs or social movements to rather loose coalitions. Tied strongest together by common strategy and organizational structure, the so called *corporate actor* is the archetypical collective actor, which can be found in ministerial and bureaucratic units. In contrast to other variants of institutionalism, ACI does not allow to expand the term of *institutions* to include cultural values, organizations, or, what we in daily life call institutions, often referring to government agencies or supranational entities (Scharpf 2000b; Treib 2015, 278-279). The latter, in this scheme, are hence considered corporate actors, while an expansion to cultural values was deemed too broad by the concept's founders.[15] Yet, institutions are sensible to larger external influences, in Scharpf's term the *policy challenge*. This might be a change in the policy environment, the socio-economic structure, or specific policy legacies (Scharpf 2000b, 5-6). Most importantly in ACI, there are three building stones: *collective actors*, *actor constellations*, and *interaction modes*. To set an emphasis on these allows, according to Scharpf, to explain ex-post how policy was made and to improve institutional design ex-ante (Scharpf 2000a).[16]

2014).

15 Admittedly, the boundary between (explicit) social norms and cultural values is thin, but in contrast to more pervasive general values the first are potential subjects to sanction and reputation losses within the same community.

16 Without going into further discussion, it seems that there are several overlaps with Kingdon's *Policy Streams Approach* (Kingdon 1984) and Sabatier and Jenkins-Smith's *Advocacy Coalition Framework* (1993). Useful and

The first pillar of ACI is constituted of the *capabilities*, and *actor orientation* of actors. Special attention is given to the second, consisting of *preferences* and *perceptions* (Scharpf 2000b, 7). This brings the actors' intention towards political change or consistency to the center, and in more detail their interests, organizational loyalty, both goals of maintenance and normative aspirations, and experiences (Krekeler and Zimmermann 2014, 81; Dopfer et al. 2011).[17] Within bounded rationality, preferences and perceptions form actors' goals and in the end strategically influence institutions.[18] Institutions, on the other side, do influence the preferences, in the way that they constrain the choices actors have by providing incentives. The preferences towards engagement with other, called *interaction orientations* are also relevant as they influence policy outcomes. Scharpf outlines five orientations; individualism, solidarity, competition, altruism, and hostility. While only the first three are usually found in policy processes, and actors generally can maximize their utility by cooperation, the standard assumption is one of individualistic behavior of actors (Scharpf 2000, 148-158, cited after Treib 2015, 283).

As the interaction-oriented perspective mentioned above suggests, a*ctor constellations* play a huge role for the success of policy. In these actor constellations, the strategic capacities and relative resources of actors are assessed, their embeddedness in the logic of the situation and hierarchical relationships, as well as their degree of internal alignment and connections to other actors (Rave 2014, 6). To grasp the logic of interdependent actions by various political actors, it can help to apply game-theoretic considerations. The different actor constellations hereby can be displayed as e.g. a prisoners' dilemma or a more cooperative assurance game. While there is no simple hypothesis to be derived, several actors with strategies and perceived pay-offs can be distinguished. Grouping them into antagonistic coalitions, even if hypothetical, brings to light the different policy options and their respective conflict potential or the type of conflict prevalent (Scharpf 2000a, 128-129, cited after Treib 2015, 284). This (schematically) produces a set of competing coalitions of actors, or at least several actors aligned on a spectrum. The simulation does not necessarily require quantitative application of game theory, but can instead aim to describe the situation as precisely as possible (Scharpf 2000b; Rave 2014; Krekeler and Zimmermann 2014). While this is not easy, a critical abstraction and both a detailed empirical account and a long-term study of the process case are supportive conditions (Treib 2015, 287).

Interaction modes constitute the probably 'most institutionalist' part of the ACI: They stand for the modes of making decisions left to the actors, influencing them in their actions, and eventually

relevant for policy change as they are, the focus of ACI promised more analytical gain to me by better including institutions.

17 Which factors exactly constitute the actor orientations is controversial and subject to debate (Mayntz and Scharpf 1995; Krekeler and Zimmermann 2014).

18 This kind of discursive agency is emphasized even more in discursive neo-institutionalism (Schmidt 2008).

changed by their intervention. Depending on the given institutional arrangement, not all modes are equally present. Scharpf has listed four modes such as “mutual adjustment”, “negotiated agreement”, (majority) “voting”, and “hierarchical direction” (Scharpf 200b, 11). While these modes of social interaction present ideal types, in reality they can be integrated or co-existing in a blended form. As an example, a fifth mode of a “shadow of hierarchy” (Scharpf 2000a, 323, cited after Treib 2015, 292) describes where decisions are made in a coordinated manner, bearing in mind that they could be made more strictly. This shows the possibility of consensual decisions even under institutional conditions of hierarchy or majority voting. Scharpf acknowledges that negotiations involve high transaction costs, especially under multi-actor conditions. Nevertheless he admits that iterated interaction and the context of networks favor cooperation (Scharpf 2000a, 231 – 236; cf. Treib 2015, 289).

The relevance of the fine-grained differentiations appears when we review a basic argument made by Scharpf: Different actor constellations, exposed to different interaction modes, in different institutional contexts lead to different political results. That means that some conflictual situations are being solved under certain conditions, but are perpetuated under others (Treib 2015, 288).[19] A specific *action situation* under scrutiny, produced by the conjunction of actor constellation and interaction mode, can accordingly be described on an abstract level, and then be compared to other situations. This makes this framework so apt for comparative policy research, as for example to evaluate the potential of modified institutions towards increased capacity for climate change adaptation (Krekeler and Zimmermann 2014, 82; Rave 2014; Figure 1).

To sum up, the interaction of actors and the institutional context are highly relevant for ACI. Scharpf admits that the framework does entail a rather complex understanding of the ordering power of the institutional context. However, more simply, it is a description of “the most important influences on these factors which actually dominate our explanation – actors with their preferences and capabilities, actor constellations and interaction modes” (Scharpf 2000a, 78; own translation). This complements neo-institutionalist thought with the view that actors who adapt and intervene the institutional framework produce policy change while at the same time being constrained in their options. “Institutional change is not the effect of exogenous shocks, but brought about by the same actors that play the substantive game” (Radaelli et al. 2012, 547).

Nevertheless, two potential limits of the ACI remain: As the model stays focused on different constellations of actors, it assumes clear cleavages, irrelevant of their visibility or not. This might lead to a deterministic prescription instead of a category of analysis, for example of conflict lines within certain organizations or if some actors act more ideologically than others (Treib 2015, 298).

19 Interestingly, in ACI the normative evaluation of what means successfully solved is based on the two criteria of overall welfare and distributional justice (Treib 2015, 289).

Secondly, critics take offense with the complicated nature of a research heuristic not explicitly elaborated. Here the problematic tendency of ACI is to become over-complex while trying to grasp many aspects of the policy process. Its developers themselves acknowledged the fact that in this "double perspective on actors and institutions" (Mayntz and Scharpf 1995, 46; own translation) the ACI provides no explicit research design and that its analytical openness makes it harder for researchers to translate the concept into attributes and measurable indicators. In order to facilitate analytic research, however, a simplifying reduction of the real-world complexity into observable variables is necessary (Mayntz and Scharpf 1995, 61). I will come back to this point at a later point. I counter the reservations brought forward by engaging with the literature on sustainability transitions: As many scholars recently have shown, transitions are far from being conflict-free, but often developments from niches meet incumbent actors and their resistance at the regime level (Geels 2014; Hess 2014; Späth and Rohracher 2015). Secondly, the concept being so open actually allows productively adapting it and applying it to cases of sustainability transitions. Giving these cases and the research a more theoretically grounded account of institutional and political processes is dearly necessary, as Bulkeley's concluding remarks remind us:

> "This is not to suggest that any one of these frameworks might be better than another, but it is a call for *more theoretical engagement* in the field and for the need to unpack some of the fundamental categories of analysis. *Rather than viewing the city as an actor* responding to global processes of environmental change and political fragmentation, this review has suggested that the urban governance of climate change is *constituted through a myriad of public and private actors* (operating across different scales and through multiple networks) and mediated through sociotechnical infrastructure systems and, in the process, is creating an arena in which *what it means to act* in response to climate change *is being defined* and, with it, what it means to have *authority to govern*." (Bulkeley 2010, 248; own emphasis).

3.3. Building a Framework of Analysis by Integrating Agency in Socio-Technical Transitions

After having presented the framework of actor-centered institutionalism, I will now connect it to the preceding review of transitions studies and urban climate governance to construct a concept for analyzing urban transitions. I set out by engaging with the multi-level perspective that is common in transition studies. As Geels (2013) has explained, three analytical levels stand out: niches, regimes, and an exogenous landscape. As transition processes are happening on all analytical levels, the categories can be applied to different empirical levels. Put simply, cities can be considered regimes in one case, whereas in a national perspective they also can be considered niches for radical innovations (cf. Hoppe and Van Bueren 2015). There also incidents in which cities might act as primary actors, or have an overall irrelevant role in larger markets (Geels 2011). The categories of

ACI, starting one level below, can be combined roughly. On the micro level, the actor orientations have no equivalent. But where interactions meet institutional context on the meso level, the niche innovations break into the regime. On a macro level these institutions provide for a new societal environment, in other words, the new regime influences the landscape (cf. Mayntz and Scharpf 1995; Geels 2004). This might seem simplistic to experts of either ACI or transition studies, but it theoretically proves that a connection can be established.

Admittedly, this goes beyond the approach of transition studies so far. By choosing actors as the unit of analysis, I want to break open the 'black box' of the socio-technical regime. In addition, while the literature of transitions studies is focused on the national perspective, I chose to analyze the urban scale. Far from maintaining that local actors can bring upon change exclusively (cf. Geels 2011, 27), I argue that at this level more agency can be assessed in a more productive way (cf. Hodson and Marvin 2010). As I am interested in the politics of urban transitions, I will refer to cities as the urban places where actors in their capacity as multiple entities and collective organizations are interacting to foster a transition in their regime (cf. Joergensen 2012). At this level, the intent of the research is to bring more clarity into the general conundrum of the political agency, how it is used for change, under what conditions, to what effect. Many scholars agree that political leadership plays an important factor in urban transitions (Norn 2014; Hoppe et al. 2015); yet attempts to explain it theoretically satisfactorily are scarce. The same accounts for the interdependence of political leadership and political actors in urban governance settings. This could also happen in networks or bridging institutions (cf. Loorbach 2010; Brown et al 2013, 716). As Norn rightly claims, “we need to pay more attention to informal basis of leadership by looking at the interplay between the leadership and policy network(s)” (Norn 2014, 3).

Based on the previous elaborations, I make three assumptions: I hypothesize that niche actors try to change the processes and rules in a city by striving for a transition, and hereby try to enact regime change. If successful, they change the rationale of governance for this policy, and consequentially the city administration, other actors, and the population will be more inclined to support a transition. Because institutions structure the way actors interact, certain change will only happen if the very institutions are changed (Scharpf 2000a).

I also hypothesize that conflicts will appear where some actors with progressive orientations encounter resistance from incumbent actors whose orientations are more aligned with the institutional rules. Policy is a contested field, and political conflict can be attributed to different coalitions of actors. Where this conflict becomes apparent, the politics of urban transitions become visible (Späth and Rohracher 2014; Geels 2014).

Third, I hypothesize that successful urban transitions take place when the actor constellations are set

up in a way where cooperation is emphasized and the city administration officially endorses the transition process[20]. This builds on the idea that the policy outcome can be expected to change given a certain actor constellation and a changed institutionalized interaction mode – or vice versa (if the actor constellation changes) (Scharpf 2000a, 94). Based on the historically rather voluntary role of climate governance in cities, it can be assumed that the most likely interaction mode is negotiation (Bulkeley and Betsill 2013). In sum, these hypotheses concern the reasons how and why transitions occur in cities, and attempt to explain a reasonably large picture of factors.

3.4. Designing Categories for Empirical Research

I define political agency as the strategic combination of political will and political action. This resonates with many concepts in the policy literature, most notably the concept of policy entrepreneurs or political agency that use certain resources and conditions (Kingdon 1984; Lowndes 2010; Block and Paredis 2013; Mintrom and Norman 2009). Theoretically, this is a compromise between the two relevant factors of "institutional capacity" and "political economy" in urban climate governance (Bulkeley 2010, 241). For reasons of brevity I will leave a discussion of what agency specifically entails to future study. General support for my argument most directly comes from recent research on "actors working the institutions in sustainability transitions" (Brown et al. 2013). Conceptualizing political will and political action, the first can be roughly connected to the orientation of actors, whereas the latter is brought upon by actor constellations, dependent on interaction modes. This is the working mechanism how actors (and institutions) influence transitions. Deriving independent variables from ACI, I argue that four attributes of political agency can be constructed: The *capabilities of actors and their perceptions* thereof (1) as they influence the actor orientations; as well as the *interaction orientations* (2); the *actor constellations* (3); constituting the action situation together with the *interaction modes* (4). A fifth variable to control outside the realm of political agency is the context, or exogenous landscape events, most closely related to the *policy environment* (cf. Scharpf 2000b; Geels 2011).

As the dependent variable, I chose change in *urban green building policy* defined as "an activity or regulation undertaken or adopted by the municipal government that leads to the reduction or prevention of greenhouse gas emissions" (Schwartz 2014, 3). While not measured in absolute numbers, this proxy measure could, in parallel to renewable energy installment, help reflect "the outcomes of all local decision-making processes" (Breukers and Wolsink 2007: 2738). This is a relevant restriction of my research, as it deals with one specific type of climate change mitigation policy.[21]

20 See the discussion above in section 2.2.

21 Noticing the topic of building in climate protection repeatedly coming up, confirmed in the interviews, I decided to

4. Methodology & Research Design

Ontological and Epistemological Approach

My research is based on a critical realist foundation, which holds that social processes are complex and do not follow mechanisms identifiable through positivist attempts of falsification alone, and 3) human agency involved in the processes is reflexive and co-constitutive of them (cf. Marsh and Furlong 2010).[22] An interpretative approach to transitions is helpful, while I acknowledge that the interpretations of the researcher always remain imperfect (cf. Block and Paredis 2013; Avelino 2011). As the issue of urban climate governance is relatively new on the agenda, I propose exploratory rather than confirmatory research. Qualitative research can explore new areas for theory, access these phenomena directly, and give an in-depth account of complex details as compared to quantitative (Vromen 2010). Hence, the focus is on finding new insights rather than testing them.

Conceptualization

Several studies have teased out the assumptions of ACI for empirical research before (Krekeler and Zimmerman 2014, 82; Puetz 2011; Keppler 2013; Dopfer et al. 2011). It is from this established point that I conceptualize my research. In this thesis, conceptualization was built on previous literature (hence resonance), adapted and modified (hence differentiation), and was created for the purpose of analyzing an empirical case (hence causal utility) (cf. Gerring 2012, 112-140). The extensive review and discussion of the theoretical premises contribute to high construct validity, i.e. the criteria analyzed in empirical research are considered in the theory (Behnke et al. 2006, 125). Where appropriate, I triangulated the framework with other approaches to enhance validation. Furthermore, a provisional 'facet approach' to operationalization ensures a high content validity (Behnke et al. 2006, 125; cf. Gerring 2012, 160).

Case Study

My research follows a qualitative case study approach. In order to study actors and their interactions over time, a single longitudinal case study approach was employed (Yin 2009). I wanted to use the

let it guide my empirical analysis. I made this qualification at a late stage, and consider it to be part of the concept of an energy transition. Urban green building policy arguably can affect all three factors of energy efficiency, energy reduction, and renewable energy.

22 Also note that difficulties in the presented framework might result from ontological uncertainties in the transitions literature and actor-centered institutionalism. For further discussion, I refer to the discussion of seven different ontologies by Geels (2010).

discussed framework to account for the political factors in local energy transitions and apply it to the case of a city. The city of Freiburg is interesting to examine because it is recognized as (and claims to be) a frontrunner in sustainability efforts (Fastenrath 2015; Purvis 2008; FWTM 2014). While Freiburg is an extreme rather than a typical case, it certainly is an influential one as it is known as a model beyond Germany. These well-documented cases of frontrunners make it possible to refine the theory, and hence gather more empirical insight for urban transition processes on a broader base. Recent research has indicated that transition processes are contentious even in the frontrunner case of Freiburg (Späth and Rohracher 2011; 2015). However, previous research has neither focused on the politics of the whole medium-sized city nor employed a framework that considers interdependent actors and institutions. Furthermore, if the selected framework can be empirically validated, then it could be used for other cases as well (cf. Gerring 2004). A potential reduction in external validity can be a pitfall of a qualitative case study approach (Baxter and Jack 2008). Yet analyzing policy and agency in depth can provide useful guidance for policy makers and advocacy groups, thus making this analysis even more relevant for the future. A theoretically grounded analysis of a case is useful for this purpose.[23]

Data and Interviews

The case study was conducted using primary and secondary data. I analyzed policy documents from the city administration, environmental research centers, and interest group representations, and conducted interviews with a few experts involved in the transition process. This mixed methodology helped me gain a better insight to the situation of Freiburg. Acknowledging my temporal limitations, I only analyzed document material available on websites or in journals. This confines my research to official documents from mainly the last two decades.

I conducted six semi-structured interviews in Freiburg. They can be characterized as elite or expert interviews, since the interviewed person is seen as knowledgeable on her professional field, which helps the researcher's explorative work (Berry 2002). This is a very common standard in research on transitions (Keppler 2013, 100; Brown et al. 2013). I interviewed people from several organizations involved in the process of energy transition over the last years for interviews, including:

- an academic from the University of Freiburg researching the energy transition in Freiburg
- a consultant, and former group leader for climate protection in the Office for Environmental Protection of Freiburg
- the vice-chair of the Office for Environmental Protection of Freiburg
- the spokesperson of *Energieagentur Regio Freiburg*, an energy consulting agency

23 Ideally, a comparison of cases over time enables the researcher to identify the underlying causal mechanisms of observed phenomena (Scharpf 2000b).

- ≅ the energy spokesperson and city council representative for the local Green Party
- ≅ one member of the citizen group *Forum Vauban*.

Experts were identified through theoretical sampling (cf. Keppler 2013, 102). The interviews were not transcribed, but recorded while notes were taken. Interviewees were asked if they wanted to be treated anonymously, which they mostly declined, and if the interview data could be used for further research, which they admitted. To increase reliability, the same set of questions was prepared for every actor, although additional follow-up questions came up individually. The questions were constructed based on the insights gained from other case studies. The list of questions (see Appendix B) was divided in three blocks. The first one asked for the own position and experience with respect to the energy transition in Freiburg and for a first overview of other actors. The second part contained questions regarding definitional and historical content, e.g. what energy transition means for the interviewee. In the last part, potential conflicts and decision powers were inquired, asking for the more subjective estimation of Freiburg's situation, and concluding with the explicit question to what extent the implementation is dependent on political agency. The interview was lead in a structured way, yet with space for follow-up questions where new aspects from past interviews could be included. The interviews lasted from 40 to 80 minutes and took place in July 2015, in the offices of the representative's organization or in public spaces.[24]

Data Analysis

To answer my research question, I evaluated the data of my case. The evaluation of the interviews followed the principles of qualitative content analysis, which differentiates summary, explication, and structuration (Mayring 2008, 58; cited after Keppler 2013, 104). Learning from other studies of transitions, the focus was put on summarizing the data and reconstructively paraphrasing core statements in order to grasp the complex interdependency at work (cf. Keppler 2013, 104-105; Späth and Rohracher 2015; Hoppe et al. 2015; Block and Paredis 2013; Dopfer et al. 2011). The empirical material was used in a tracing process to reconstruct the decision-making process as a causal, consistent story (Norn 2014, 10). Making sense is an important element in reconstructive approaches and is the qualitative equivalent to explaining direct causal mechanisms in quantitative research. Looking out for coherence can thereby help to reduce the inherent bias of the researcher and the participants (Vromen 2010). It is nonetheless important to keep in mind that the data generated and used do not reflect an unfiltered reality but rather involves the choice of the researcher. As explained in the section above, the categories of analysis were built deductively from the framework of ACI and provisionally operationalized to fit empirical institutionalist analysis and

24 In one case the question list was answered in written form instead of an oral conversation. In one case the interview took place over the phone.

to facilitate better understanding of the gathered data (see Appendix C).

5. Case Analysis

5.1. Case Description: The Greening of the City of Freiburg

Many observers have described how Freiburg evolved from a university city embedded in the Southwest of Germany to one of the model cities for a sustainable transformation (Fastenrath 2015; Thorpe 2014; Purvis 2008; Kronsell 2013). For this reason, I will cover the historical development of Freiburg briefly and focus more in depth on the actors involved in the transition.

From Early Ecological Awareness...

In the 1970s, the federal government decided to allocate a nuclear power plant close to Wyhl am Kaiserstuhl, which is about 20 kilometers away from Freiburg. Protests, mainly organized by local residents, farmers, and students finally prevented the power plant. Spurred by this event, many citizens realized they had to build alternatives to the current energy system. As a consequence, an interested and knowledgeable 'energy scene' developed. Their ideas were taken up quickly by the representatives of the new party *The Greens* who first were elected to the city council in 1980. In 1986 the council adopted three goals for an alternative energy policy: to increase renewable electricity, to abandon nuclear power, and to expand the co-generation of combined heat and power, long before these topics were to be discussed on national or EU agendas (Bündnis 90/Grüne Freiburg 2015; Späth and Rohracher 2015, 275). At the same time, the municipal *Office for Environmental Protection* (Umweltschutzamt) was created and has since exerted significant influence on Freiburg's development policy (Fastenrath 2015; Figure 2). Per capita emissions have been reduced by 25% from 1992 to 2012 but are still about 8 ton of CO_2 (City of Freiburg 2015a).[25]

...to Environmental Capital...

Since 1997, this development has also included explicit climate protection targets (Kronsell 2013, 2). Progress has been made in the fields of energy provision, mobility, water and waste management, and land use and infrastructure development. It is now a declared goal of the city to cut emissions by half until 2030, becoming carbon neutral in 2050 (City of Freiburg 2014a).

25 While the German average per capita CO_2 emissions are about ten tons, the Chinese are about 5 which also equals the global average, and the Indian closer to 1 (Olivier et al. 2014; Vaughan 2009). One ton of CO_2 per person is also what humanity should aim for by 2050 if dangerous climate change is to be avoided (i.e., global warming should not rise beyond 2 degree Celsius) (Meinshausen et al. 2009).

Supported was this partially by the city's decision to buy back the shares of the regional energy supplier in 2000 after previous liberalization, which resulted in the creation of the co-owned company *badenova.* In the meantime, one municipal innovation has been to require 10 % of the concession levies paid by *badenova* for water and electricity pipeline rights to be used as targeted investment for climate protection projects since 2008 (25% since 2015) (FWTM 2014). In the new quarters of *Rieselfeld* and *Vauban* that were started in the mid-1990s, collaborative planning approaches were realized. This resulted in citizen-driven working groups, represented e.g. by the *Forum Vauban* and local *Baugruppen* (prospective homeowner cooperatives), ultimately reducing living costs as compared to conventional for-profit development (Coates 2013). Freiburg has gained awards as "Germany's Environmental Capital 1992", the "City of the Future at the EXPO 2010 in Shanghai", "European City of the Year 2010", and "Climate Capital Germany 2010" (Kronsell 2013, 2).

… and to a Sustainable Transition Model?

As early as 1992, the city council introduced the *Freiburg Low Energy House Standard* (Freiburger Niedrigenergiehausstandard, FR NEH) which reduced the heating demand for new construction by 50 %. Until 2012, the city continuously modernized the standard to be ahead of EU and national standards, with the biggest difference being the low heating demand (Fastenrath 2015, 18-19). With many passive energy houses or houses producing more energy than they consume through photovoltaic panels, the quarter *Vauban* features a lot of housing innovations, including modifications to state laws (Figure 3). More recent urban developments include the retrofitting of old high-rise buildings into passive houses. Furthermore, public transportation was expanded to service into close neighborhoods, new combined heat and power plants were built and model projects in retrofitting are subsidized and coordinated. The *Dietenbach* area is considered a new development site expected to start construction in 2020 for around 10,000 new inhabitants (FWTM 2014). Yet as the city owns only about 3% of the existing buildings, the retrofitting rate is below 2 % per year, and the energy standards only account for new construction, limits of such an approach appear (Interviews 2 and 3; City of Freiburg 2015a). Additionally, debates regarding the *Dietenbach* area, the publicly owned housing units or the planning of a new large office building show that energy standards are far from being uncontested (Interview 2). Critical voices repeatedly either criticize the signs of fatigue hindering further frontrunner progress (Interview 2; cf. Fastenrath 2015), or the neglect of social issues and the embeddedness of G*reen City* programs in neoliberal growth paradigms (Purvis 2008; Freytag et al. 2014).

Involved Actors

The city of Freiburg has about 220,000 inhabitants and is governed by mayor Dieter Salomon. From

1962 until 2002, the city has been governed by two social democratic mayors, the latter being an outspoken supporter of renewable energy and public housing. Currently, the 48 seats in the city council are distributed between The Greens (11), the Social Democrats (8), the Christian Democrats (9) with the remainder left to left-alternative, liberal and independent lists, making up a total of 13 different lists (City of Freiburg 2015b). The five administrative departments are split accordingly between them. Presenting the mayor in his second term, the Greens enjoy unusually high support in this city compared to national levels (Kronsell 2013; cf. Unfried 2011). The municipally co-owned local energy supplier *badenova* provides about 80 % renewable energy (Badenova 2015). The municipally owned *Freiburger Stadtbau GmbH* with about 10,000 housing units is the main provider of public housing. The municipally owned company *Freiburger Wirtschaft Touristik und Messe* (FWTM) is the main promoter of economic development and tourist management. Furthermore, the city is characterized by research centers such as the university, the university medical center, five *Fraunhofer Institutes*, as well as several small and medium-size enterprises in the area of high-skilled technology and regional companies (Wikipedia 2015). Especial importance can be attributed to the *Öko-Institut* (founded in 1977) which is said to have coined the term energy transition (KomMA-P 2015). Most notably, Freiburg accommodates a high number of civil society organizations concerned with environmental issues, among them a confederation of groups in the *Klimabündnis* (2005), the network e*cotrinova* (1992), local chapters of *BUND/Friends of the Earth Germany* and *Greenpeace* (before 1991), and other groups. *Forum Vauban* is an association of committed citizens which was created in 1994 with city support and has since been involved in the planning and development of the new quarter (Coates 2013). In a similar fashion, several ecologically-oriented interest group associations and consulting agencies like the consulting agency *Energieagentur Regio Freiburg* (1999), the *fesa e.V. Förderverein Energie- und Solar-Agentur Regio Freiburg* (1993), the European Secretariat of the transnational network *International Council for Local Environmental Initiatives (ICLEI)* (1992), and the *International Solar Energy Society* (1995) generate a high density of experts.

5.2. Analysis: As Green as it Could Be?

In this section, I will now analyze the institutional context of actor constellations and interaction modes, and through a reconstruction of interview data point to political conflicts that I had discovered. After giving a first illustration, I will schematically outline the actor constellation and other factors, before I turn to a discussion of the results.

One example of conflict is the disagreement over different sustainability strategies regarding heat infrastructure and low energy building standards as elaborated in detail by Späth and Rohracher (2015). Here the decision to connect the new quarter *Vauban* to the district heating system (DHS) was challenged by citizens and *Baugruppen* under the banner of the *Forum Vauban*. The new organization had been able to influence the development plan significantly. Investing more in self-reliant passive house standards instead, they now argued, made it economically unreasonable to force them to connect and pay the high upfront costs. Their proposal to waive the obligation or replace high fixed costs by higher consumption costs, however, was not successful. The conflict was settled by the option to be exempted from this obligation against demanding and expensive conditions which "only a handful of passive-house builders/tenants made the effort to prove" (Späth and Rohracher 2015, 277). Looking at this first example through actor-centered institutionalist variables is helpful: The actor constellation mainly consisted of the *Forum Vauban* on the one side and the city council and the municipal utility, predecessor to *badenova*. The capabilities of the actors were unevenly distributed. While the *Forum Vauban* had publicly paid staff members that allowed them to build up expertise, the city council had legal experience, had formal powers, and better access to the utility's calculations. The perception of both groups was that they had to build a model district of sustainability, although the citizen groups pursued multiple ambitious sustainability goals. The interaction orientation can be described as individualism since each group tried to maximize their own advantage. The city council, however, had an interest in keeping the heat demand and hence profit from the utility above a certain level as it is a relevant source of income for the city. The interaction mode was a hierarchical one between the citizen group and the city council, and one of voting within the council. Although the *Forum* was formally involved in the planning process, the city council would make the final decision. Rather than following a principle of ordered governance, "conflict between activist citizens and the city was at the origin of the Vauban development" (Coates 2013, 3).

To illustrate the use of Scharpf's concept here, let us quickly assume either the actor constellation or the interaction mode would have been different (Hypothesis 3): If the city council (assuming self-interest) had not been dependent on the utility's profits, it would have been able to create a better compromise. Or, if the decision had not been made through the city council's vote, but rather through a negotiation, then the passive house owners would also likely have been better off. Looking at the other hypotheses, it becomes clear that contested policies resulted from differing orientations of actors which produced conflict (Hypothesis 2). Secondly, the rationale of governance for this policy inhibited the niche actors' desire for a stronger transition. Yet, in the aftermath, the Office of Environmental Protection reevaluated the energy policy agenda, making the friction

between heat demand and low energy building more obvious (Hypothesis 1).

Looking at the city administration and public officials, their role in Freiburg's energy transition appears ambiguous. Among important capabilities are the mainstreaming of federal and state funding programs into urban projects and the distribution of the 25 % concessionary fees towards climate projects. Within the administration, several departments also work out the public zoning plans and private urban development contracts for the exploration of new areas. The city stresses their efforts to realize targets within the limits of the realistically feasible (City of Freiburg 2015a). This means mediating between uninvolved constituents who have to be convinced and more idealistic citizen groups and their "one-sided interests" (Interview 3). This view is generally in line with the representative of the ruling coalition who emphasized the need to find majorities for implementation. Most participants interviewed confirmed that officials show rather cooperative behavior and that an unusual high degree of common sense in general exists in Freiburg. Yet, as one interviewee stated, "much action comes from outside" (Interview 2) of the city administration. This is a recurrent view among actors. While the city created an Office for Sustainability Management in 2011, critical voices claim this has done nothing besides increasing the 'green reputation' of the city (Interview 6). Committed *Forum Vauban* member Lange claims that "in the end, Vauban has been developed mostly without the city, the Greens, and Salomon" (Unfried 2011; own translation). Accordingly the *Klimabündnis* has repeatedly its discontent with the city's efforts (Klimabündnis 2015), and alongside the *BUND* group tries to exert pressure, e.g. by criticizing the reconstruction of the university library (BUND 2015). Here organizations who can look back at their social movement origins such as the *Öko-Institut* or *Energieagentur* serve as bridging institutions.

Seemingly, the organizations' views differ with respect to an energy transition, with some being more radical and explicit than others. One question asked the interviewees regarding their definition of an urban energy transition. While concrete answers revolved around the percentage of renewable energy installed, the rate of retrofitting, and the number of model projects, different opinions were clearly visible.[26] Nevertheless much success is attributed to citizen group engagement and diversity in interacting with the city administration and pushing for change (Späth and Rohracher 2014, 1425). Common reasons for participation are often attributed to resources and social capital in the literature, but matter less than rules-in-use shaped by actors (Lowndes et al. 2006). While Freiburg is a prosperous university city, more credit can be given to the openness of the political system, the institutionalized acceptance of green policy, and the longstanding tradition of civil society organizations who engage in energy governance (Interview 1; cf. Kronsell 2013). As state laws have

26 One idea from the practitioners' side are the *Vauban 10 Theses for the Sustainable City*, prepared by Forum Vauban and ICLEI (in Coates 2013, 18-20). Another set of criteria to interrogate real progress towards low carbon urban transitions comes from academia (Moloney and Horne 2015).

long since enabled local participation, citizens' efforts, through more conflictual engagement in the past, were taken up and processed by the local authorities. These early and continuous challenges to the regime (The local anti-nuclear slogan 'We just said no!' is still used at various occasions) helped to bring about a more progressive attitude in the city and among officials (Interview 2 & 6).

Different actor constellations exist for instance regarding the support for *Mini-BHKWs* (small CHP plants) in new developments. While the *Klimabündnis* and *ecotrinova* strongly advocate for their increased use, both *Öko-Institut* and *Energieagentur* take a more moderate stance, arguing for a multi-facetted approach (Kenkmann et al. 2011; Interview 4). *Badenova* is likely to show some resistance to this strategy, impacting the preferences of the city administration and council (Interview 6). Of relevance is the comparatively high number of homeowners associations and low number of public housing. This makes it more difficult for a city to access existing infrastructure to negotiate energy-efficient redevelopment (Interview 5). Another conflict becomes apparent in a current discussion on the new office building complex of the *FWTM*. The municipal company is planning the construction for about EUR 20 mio. and has not exceeded the local minimum building standards. Many interviewees saw this as a case where no institutionalized control was in place to ensure ambitious energy standards. Accordingly, the Greens and others demand to construct the new office according to higher energy-efficient standards than just the necessary one (Bündnis 90/Grüne Freiburg 2015). Just fulfilling minimum standards, they say, will not advance the path Freiburg has taken so far. Similar critique concerns the construction of a new stadium for the local soccer team, or the planned development of the new *Dietenbach* area, where some see old conflict lines from the 1990s being reproduced (Interview 3 & 5). This critical attitude towards the ambitions of the city seems to mirror a common feature in Freiburg, and shows the influence of niche actors. In contrast to elsewhere, however, the biographies of some interviewees indicate that they have transitioned in their positions from the niche to the regime (Interview 3 & 5). For instance, one interviewee mentioned that he had done his civil service year at the *Öko-Institut*. While exact evidence of "actors working the institutions" (Block and Paredis 2013, 1) is hard to discern, this approach of informal transition leadership has certainly shaped transition policies as well and and made the energy transition more desirable. This finding resonates well with the theory: "An implication of the new institutionalism, then, is that efforts to secure major change must be informed by insider sensibilities " (Mintrom and Norman 2009, 656; cf. Norn 2014).

Trying to discern actors' interaction orientations, individualistic behavior can be assumed in principle. This can be seen in the *Vauban* case since each group tried to maximize their own advantage. However solidarity is possible, especially between the different civil society and research organizations. All interviewees noted a high consensual orientation in general. The city

council, however, features conflict between different parties both in substance and in organizational structure as they compete for voters and issues. For instance, the spokesperson of the *Greens* indicated that it would be unreasonable for the conservatives to advance climate protection too much since people in consequence voted more liberal. Clearly, competitive interaction orientations between parties can be discovered.

The interaction mode can be best characterized by the ways in which decision-making took place and to what extent compromises were established. As showed above, the *Vauban* case was solved by employing the power of hierarchical rule. This should not come as a surprise, since the city government as the local authority also has the highest legitimacy to do so (cf. Kronsell 2013). However, negotiation processes also take place: In the case of the small area *Gutleutmatten* which is currently under construction, building concepts integrate solar thermal and district heating as a compromise (Interview 5). Recent discussions include the *FWTM* office building complex and the *Dietenbach* area. While the latter was highlighted multiple times in the conversations as the new challenge for negotiations, the *FWTM* case appears to be one where mutual adjustment is easier done by the city administration. Since 2013, the city council has also established a non-binding architectural advisory board to evaluate developments plans independently (FWTM 2014). It has to be seen whether the city council as a watchdog can correct the development plans. This could also be an example for a municipal entity acting in the shadow of hierarchy, since several council members are also members of the supervisory board.

As described above, certain outside events helped creating the awareness and status as an environmental role model. Among these mobilizing moments were the oil crisis in the 1970s, protests against the planned nuclear power plant in Wyhl, the institutionalization of the environmental movement in the 1990s, the quasi re-municipalization of *badenova*, and the rise of climate change on the public agenda (cf. Karapin 2014). Due to local actors, these windows of opportunity were consequently exploited. Ultimately, negative influences of the outside policy environment are observable as well. Many interviewees stressed how the Freiburg strategy of focussing on combined heat and power and green building measures depends on national pro-renewable legislation which has become more unfavorable at the moment.[27] As cheap coal is displacing natural gas from the electricity market, this lead to several gas plants stop working (Interview 1).

27 They refer to the 2014 amendments of the EEG (*Erneuerbare Energien Gesetz* (Renewables Energy Act)) and the 2008 and 2012 amendments of the KWKG (*Kraft-Wärme-Kopplungsgesetz* (Combined Heat and Power Act)).

6. Discussion of Results

The findings will now be put in context and used to answer my hypotheses. As shown, political disagreement about the energy transition is not unusual in Freiburg. Local climate governance, despite a broad consensus, is shaped by different groups with different goals.

The first hypothesis was that actors' interactions influence institutions and if successful, niche actors change institutions. In the case of Freiburg, the proponents of an energy transition have gained significant leverage within the city administration, among other actors, and the population. Public participation is widely accepted and the institutionalized committees and organizations dealing with the issue have been increased in number. Their interactions have created a higher density of norms and formal rules that govern energy and climate policy, an example being model building policies. These institutions then structure the way actors interact and face new policy challenges. For example, the municipal energy provider merged with other energy providers to form a regional company which is partially controlled by the city administration and the city council. This set-up, making the city benefit substantially from the revenue, in turn conditions the way climate governance is executed in a city. Another example is the strategic use of agency for transition-supportive policies. As state laws had to be changed to allow for the *Vauban* concept shows that institutions are alterable. This resonates with institutionalist insights on complex policy change that "law is one of the resources in the policy process, and it can be used, not used and manipulated in the same way other resources such as knowledge and money are" (Radaelli et al. 2012, 547). However, some institutions also remain outside the reach of a city alone. These arguments make a general case for the change happened in Freiburg. Hence, it can be argued preliminarily that the institutions have changed to a certain degree, and hereby regime change at the city level has been enacted. Critically, one might however ask how much the urban regime has changed. Is a radical transformation underway or has it just been a seizure of 'low-hanging fruits' in climate policy? Here more methodological and comparative assessment is necessary.

My second hypothesis was that highlighting conflicts and politics can show the institutional alignment of incumbent positions. This can help to bring forward actor constellations or differences in orientations. The examples of *Vauban*, *FWTM*, *Dietenbach*, and *CHP* strategies point to some conflicts visible in Freiburg. They reveal different actor constellations. To put it drastically, it might be possible to characterize the city administration and the utility as incumbent actors. However, in different situations the actor constellations do look differently. While in one case citizens can be put against the city administration and the city council parties (*Vauban*), in another case some parties are criticizing the city and its company for not doing enough (*FWTM*). These diverging views and

conflicts play out between supposed advocates of energy autonomy and control, between ecological idealists and economic realists, between politicians and visionaries, or between proponents of sufficiency and of green development. The outcomes of the conflicts are likely to represent the preferences of the incumbent actors. On the other side, the fact that some say “'Vauban must not be repeated'” (Interview 2) shows that coalitions and winning parties are dynamic. It has been shown that a focus on politics reveals certain positions, although the exact mechanisms need further clarification.

Third, it was argued that the institutional set-up is a decisive factor for success. If the municipality champions an energy transition, it is more likely to be successful. Based on the literature, city support for climate action is not surprising, but the extent to which cities supports it is decisive. The city of Freiburg has many active initiatives to improve green building policies. On the other hand, the decision of the city to call itself 'Green City' was heavily criticized. On official 'Green City' publications, the word 'energy transition' cannot be found anywhere which indicates a lack of explicit support for the energy transition. At least partly, the third hypothesis does not hold true. Yet if actor constellations and interaction modes constitute the set-up, a transition requires a change in at least one of them. Assuming that the actor constellation has not changed significantly, it is the interaction mode which needs to have changed. Based on the analysis, it was not possible to determine the modes of decision-making sufficiently. One difficulty is certainly that the ACI has been used mainly to analyze national policy and that little application of its specific criteria has been done. While it is hardly possible to settle this discussion, it can be preliminary concluded by that changes have happened in Freiburg. As the hypothetical actor constellations have changed little (there are advocates and opponents of green building policy), it is most probably an institutional change responsible. Here it probably is the change from hierarchical decision-making to one of negotiated agreement that has taken place (all interview participants stressing the cooperative interactions in Freiburg). In sum, two contradictory indications for the third hypothesis result, given they both include a lot of analytical instability. Therefore no definite answer to the last hypothesis can be given; if looked through the perspective of ACI, the institutional set-up most likely matters in the particular context.

Due to the constraints of this thesis I was not able to analyze single conflicts more in depth. Some more general conclusions can be drawn nevertheless: The efforts by committed individuals to bring about transition momentum are essential. This can happen by making demanding proposals to the city administration, gathering extensive knowledge, consulting as experts, starting model projects, and/or challenging the established regime. In order to sustain that progress, however, it is necessary to interact with incumbent actors and induce institutional change into the regime. However

important the role of municipal policy entrepreneurs, they also face several constraints from their institutional environments. This was particularly obvious interviewing the Green party spokesperson who showed more consideration of the boundaries of party and constituency. Last, it is telling that ambitious objectives and actual achievements are two different things, as progress happens incrementally and the more radical expectations have never been fulfilled (Späth and Rohracher 2011). Theoretically, I can agree with many conclusions of Brown et al. (2013) from their long-time study of actors in the case of Melbourne. In the end, however, I disagree with their cautiousness regarding the ultimate cause of the transition. I conclude that both researchers and practitioners would profit from an increased focus on political agency in transitions. Moreover, as this case has shown there are certain conflicting interests when it comes to the shape of an energy transition.

Limitations

The empirical research, being my first time doing consecutive interviews, can certainly be improved. I went into the interviews quite naïve, believing that the interviewee would directly respond to my research question. I also selected a small, not exhaustive sample of experts, and asked for interviews within a tight time frame. Berry (2002) provides many hints for improving the technique of elite interviews. To complement interviews, surveys could be given out to key persons, asking questions that match indicators derived from the main variables. For future empirical analysis, network analysis could be used fruitfully to analyze actors and their interactions. While the focus was on applying a theoretical framework, it would be productive to choose a more specific method for a second analysis. It proved difficult to do a qualitative analysis without having specific indicators to focus on. In result, I tried to give a coherent insight in the relevant processes in Freiburg rather than explaining exactly by which means specific actors had changed specific institutions. Concluding, my empirical research is rather descriptive.

Although not equally successful at assessing all criteria, actor-centered institutionalist research proved useful. The transition literature could profit from considering more the literature on policy entrepreneurs, incentive structures and strategic interaction. It becomes clear from the findings that shared visions and efforts at the local level alone will not produce system-relevant change. Strategic use of political agency is needed to make successes of political and institutional frontrunners become visible (Brown et al. 2013; Kronsell 2013; Schwartz 2012). When applying an institutionalist framework, however, it was difficult to conceptualize empirical rules-in-use as institutions. In order to grasp the big picture of socio-technical transitions, nonetheless a heuristical tool like the ACI has potential for future refinement and use. During my literature research, I

noticed that the transition literature is still too young to have come up with many large-n studies. Here the research could benefit from European or American approaches to research urban climate policy by analyzing the conditions and policies advanced statistically (cf. Bulkeley and Broto 2013; Weible and Elgin 2013). For an impressive example of how to quantitatively apply the ACI to a national setting, see Kriesi and Jegen's (2001) account of two coalitions in Swiss energy policy. To include quantitative measures on urban transitions, however, requires more organizational capacity and time for research. Similarly it does not mean reducing the outcomes of transitions to a quantitative indicator alone. In terms of policy recommendations, Freiburg has much frontrunner experience with district heating networks and decentralized combined heat and power plants. This expertise and more insights on existing conflicts can serve to inform future implementation in other cities.

7. Conclusion

This thesis set out from the idea that in studying urban transitions, the city can be viewed as a regime, where actors co-constitute institutions and jointly govern the urban energy transition. Developing from critical analyses of transitions, attention was drawn to the conflictual character of socio-technical change. Subsequently a framework was created to explore the institutional and political dimensions of transition processes in the case of Freiburg. Several conflicts indicated opposing actor constellations. It could be plausibly demonstrated that the transition is not an ordered and managed process. In contrast, the analysis points to several conflicts that were not as visible as before. A closer examination of the different roles and orientation of actors showed diverging interests despite cooperative behavior and a broad common sense in general. Over the last decades, the energy governance has become more institutionalized in Freiburg, which has mediated but not ceased certain conflict situations. These conflicts range from more technical disagreements to fundamental divergence in normative goals. As citizen groups and expert networks managed to influence the institutional set-up, they also transformed the decision-making of green building policies. It has become clear that local actors cannot influence transitions from pressure groups or niches alone, but that successful implementation of radical policy change also requires strategic agency and institutionalization. Signs of this aspect of transition are at least available in Freiburg. While the political will of the city administration is constrained, this setting has nevertheless produced regime change to some extent.

Taking a reflective look at the literature, there is a growing overlap between studies of transitions and urban climate governance. While transition studies have to mature for further application to the

urban level, and urban climate governance needs to become more aware of the complex dynamics within the city, they both can benefit from another. As reminded many times, the neglect of institutional conditions and political agency should not be continued. Here, an actor-centered institutionalist research lens can be of use to reveal the fundamental categories of analysis. This framework has shown the interactions of policy entrepreneurs and the importance of political agency. In Freiburg, actors have created highly institutionalized practices of green building policies which have yielded the city a reputation for its environmental successes. On a modified playing field, political agency continues to create contestation and push towards an urban energy transition.

At this point, it is also necessary to acknowledge the limits of the local approach: Admittedly, the city is a space in where agency can be attributed better to a few actors, and where political efforts become more visible as they play out. But unless a further devolution of authority, control and funding takes place, a decentralized energy systems remains out of reach. Not even Freiburg's mayor Salomon sets his hope in the city alone as „municipal efforts will not suffice to become carbon neutral by 2050. We need support from the state, the national level, and from the EU" (City of Freiburg 2015a; own translation). The influence of cities is limited by external and internal constraints, which shows that "we cannot state that the energy systems have changed profoundly and have been decoupled from the broader sociotechnical regime" (Späth and Rohracher 2014, 1425).

As mentioned by one interviewee, higher building standards as (albeit controversially) pioneered by Freiburg repeatedly get criticized in the national media, e.g. because of the assumed lack of feasibility and security concerns with insulation (Interview 4). In this light, it might be interesting to study whether the opponents of low energy building come from political camps close to energy providers. This thesis has not focused on the many barriers and institutional dynamics present at the national scale. For a comprehensive understanding of multi-level climate governance though, I argue, the connection must be made. Irrelevant of the most committed transition efforts on the local scale, radical change must also seek institutionalization: "The plethora of low-carbon scenarios […] do not have a remote chance of becoming reality without conducive political and institutional conditions" (Nilsson et al. 2011, 1127).

It cannot be expected that the Freiburg case is replicable to any other city even in Germany. It is also unlikely that other cities start developing the exact same way. What can be expected is that a close analysis of a working example serves the research and practice of urban transitions in two ways: By constructing a comprehensive framework that includes the political conditions of the transition process, it reminds urban planners, decision-makers, and scholars alike to pay attention to

the specific social dynamics of the respective city and adapt accordingly. It also shows that processes of urban energy transitions are not managerial programs, but critically depend on political agency of relevant actors. Therefore if transitions are to be scaled up successfully, the political organization of interests for and against sustainability efforts deserves to be assessed more in the future. This thesis has demonstrated the need to devote closer attention to the politics of urban energy transitions.

8. References

Aall, Carlo, Kyrre Groven, and Gard Lindseth. 2007. "The Scope of Action for Local Climate Policy: The Case of Norway." *Global Environmental Politics* 7 (2):83-101.

Anguelovski, Isabelle, and JoAnn Carmin. 2011. "Something Borrowed, Everything New: Innovation and Institutionalization in Urban Climate Governance." *Current Opinion in Environmental Sustainability* 3 (3):169-175.

Badenova 2015. Stromkennzeichnung 2013 gemäß § 42 Energiewirtschaftsgesetz. https://www.badenova.de/web/de/privatundgeschaeftskunden/oekostrom_2/stromkennzeichnung_2/stromkennzeichnung.html (July 26, 2015).

Bassett Ellen, and Vivek Shandas. 2010. "Innovation and Climate Action Planning." *Journal of the American Planning Association* 76 (4):435-450.

Baxter, Pamela, and Susan Jack. 2008. "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers." *The Qualitative Report* 13 (4):544-559.

Behnke, Joachim, Nina Baur, and Nathalie Behnke. 2006. *Empirische Methoden der Politikwissenschaft.* Paderborn: Ferdinand Schöningh.

Betsill, Michele M. 2001. "Mitigating Climate Change in US Cities: Opportunities and Obstacles." *Local Environment 6 (4):393–406.*

Blanchet, Thomas. 2015. "Struggle over Energy Transition in Berlin: How Do Grassroots Initiatives Affect Local Energy Policy-Making?" *Energy Policy* 78:246-254

Breukers, Sylvia, and Maarten Wolsink. 2007. "Wind Power Implementation in Changing Institutional Landscapes: An International Comparison." *Energy Policy* 35 (5):2737-2750.

Broto, Vanesa Castán, and Harriet Bulkeley. 2013. "A Survey of Urban Climate Change Experiments in 100 Cities." *Global Environmental Change* 23 (1):92-102.

Bulkeley, Harriet, and Michele M. Betsill. 2013. "Revisiting the Urban Politics of Climate Change." *Environmental Politics* 22 (1):136-154.

Bulkeley, Harriet, Vanesa Castán Broto, and Anne Maassen. 2011. "Governing Urban Low Carbon Transitions." In *Cities and Low Carbon Transitions,* Bulkeley, Harriet, Vanesa Castán Broto, Mike Hodson, and Simon Marvin (eds.), Oxon: Routledge, 29-42.

Bulkeley, Harriet. 2010. "Cities and the Governing of Climate Change." *Annual Review of Environment and Resources* 35:229-253.

BUND Freiburg. 2015. "Freiburg eine "Green" City? Lob und Kritik. Eine BUND – Information." http://www.bund-rvso.de/freiburg-oekohauptstadt-umwelthauptstadt.html (July 26, 2015).

Bündnis 90/Grüne Freiburg. 2015. "Über uns." and "Presse." http://fraktion.gruene-freiburg.de/home.html (July 30, 2015).

Burch, Sarah. 2010. "Transforming Barriers into Enablers of Action On Climate Change: Insights from Three Municipal Case Studies in British Columbia, Canada." *Global Environmental Change* 20 (2): 287-297.

Cheon, Andrew, and Johannes Urpelainen. 2013. "How do Competing Interest Groups Influence Environmental Policy? The Case of Renewable Electricity in Industrialized Democracies, 1989–2007." *Political Studies* 61 (4): 874-897.

City of Freiburg 2015a. Klimaschutzpolitik http://www.freiburg.de/pb/,Lde/232053.htm (July 30, 2015).

City of Freiburg 2015b. „Sitzverteilung im Freiburger Gemeinderat seit 1980." *Amt für Bürgerservice und Informationsverarbeitung, Freiburg Abtlg. Informationsmanagement* http://fritz.freiburg.de/scripts/iass4/internetassistent.exe?aw=Wahlen/Gesamtstadt_Wahlen_Gemeinderatswahl (July 25, 2015).

City of Freiburg. 2011. Environmental Policy Freiburg. http://www.greencity-cluster.de/fileadmin/user_upload/Dateien/Downloads/Environmental_policy_Freiburg.pdf (July 15, 2015).

Coates, Gary J. 2013. "The Sustainable Urban District of Vauban in Freiburg, Germany." *International Journal of Design & Nature and Ecodynamics* 8 (4):265-286.

Davies, Jonathan S., and Jessica Trounstine. 2009. "Urban Politics and the New Institutionalism." In *The Oxford Handbook of Urban Politics*, Susan Clarke, Peter John and Karen Mossberger (eds.), Oxford: Oxford University Press, 2012, 51-70.

Dupas, Stéphane. 2009. *Local Governance and Sustainable Energy Strategies.* Freiburg: Albert Ludwigs University of Freiburg.

Doblinger, Claudia, and Birthe Soppe. 2013. "Change-Actors in the US Electric Energy System: The Role of Environmental Groups in Utility Adoption and Diffusion of Wind Power." *Energy Policy* 61 (10):274-284.

Dodman, David. 2009. "Blaming Cities for Climate Change. An Analysis of Urban Greenhouse Gas Emissions Inventories." *Environment and Urbanization* 21: 185-201.

Dopfer, Jaqui, Nicola Below, and Martin Führ. 2011. *Wissensgenerierung im Rahmen partizipativer Stadtentwicklungsprozesse am Beispiel von München und Frankfurt: Vorstudie im Rahmen des LOEWE-Schwerpunktes "Eigenlogik der Städte"*. Darmstadt: Sofia-Studien zur Institutionenanalyse Nr. 11-1.

Fastenrath, Sebastian. 2015. "'Grünes' Bauen. Innovative Ansätze in Freiburg im Breisgau." *Geographische Rundschau* 5:16-23.

Frantzeskaki, Niki, and Hans de Haan. 2009. "Transitions: Two Steps from Theory to Policy." *Futures* 41 (1):593-606.

Freytag, Tim, Stefan Gössling, and Samuel Mössner. 2014. "Living the Green City: Freiburg's Solarsiedlung between Narratives and Practices of Sustainable Urban Development." *Local Environment* 19 (6):644-659.

FWTM. 2014. "Green City Freiburg. Approaches to Sustainability." *Freiburger Wirtschaft Touristik und Messe GmbH & Co. KG*. http://www.greencity-cluster.de/fileadmin/user_upload/Dateien/Downloads/Green_City_Brochure_English.pdf (July 22, 2015).

Geels, Frank W. 2004. "From Sectoral Systems of Innovation to Socio-Technical Systems: Insights about Dynamics and Change from Sociology and Institutional Theory." *Research Policy* 33:897–920.

Geels, Frank W. 2010. "Ontologies, Socio-Technical Transitions (to Sustainability), and the Multi-Level Perspective." *Research Policy* 39 (4):495-510.

Geels, Frank W. 2011. "The Role of Cities in Technological Transitions." In *Cities and Low Carbon Transitions*, Bulkeley, Harriet, Vanesa Castán Broto, Mike Hodson, and Simon Marvin (eds.), New York, NY: Routledge, 13-28.

Geels, Frank W. 2014. "Regime Resistance against Low-Carbon Transitions: Introducing Politics and Power into the Multi-Level Perspective." *Theory, Culture & Society* 31 (5): 21-40.

Genus, Audley. 2014. "Governing Sustainability: A Discourse-Institutional Approach." *Sustainability* 6 (1):283-305.

Gerring, John. 2004. "What Is a Case Study and What Is it Good for?" *American Political Science Review* 98 (2):341-354.

Gerring, John. 2012. *Social Science Methodology: A Unified Framework.* Cambridge: Cambridge University Press.

Global Commission on the Economy and Climate. 2014. *Better Growth, Better Climate.* The New Climate Economy Report. The Synthesis Report, Washington DC. http://static.newclimateeconomy.report/TheNewClimateEconomyReport.pdf (July 22, 2015).

Hajer, Maarten A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. New York, NY: Oxford University Press.

Hess, David J. 2014. "Sustainability Transitions: A Political Coalition Perspective." *Research Policy* 43 (2):278-283.

Hodson, Mike, and Simon Marvin. 2010. "Can Cities Shape Socio-Technical Transitions and How Would We Know if They Were?" *Research Policy* 39 (4):477-485.

Hoffmann, Martin. J. 2011. *Climate Governance at the Crossroads: Experimenting with a Global Response after Kyoto*. Oxford: Oxford University Press.

Hoppe, Thomas, and Ellen van Bueren. 2015. "Guest Editorial: Governing the Challenges of Climate Change and Energy Transition in Cities." *Energy, Sustainability and Society* 5 (1):1-9.

Hoppe, Thomas, Antonia Graf, Beau Warbroek, Imke Lammers, and Isabella Lepping. 2015. "Local Governments Supporting Local Energy Initiatives: Lessons from the Best Practices of Saerbeck (Germany) and Lochem (The Netherlands)." *Sustainability* 7 (2):1900-1931.

Hoppe, Thomas, Maya M. van den Berg, and Frans Coenen. 2014. "Reflections on the Uptake of Climate Change Policies by Local Governments: Facing the Challenges of Mitigation and Adaptation." *Energy, Sustainability and Society* 4 (1):1-16.

Jahn, Detlef. 2014. "The Three Worlds of Environmental Politics." In *State and Environment: The Comparative Study of Environmental Governance*, Andreas Duit, Cambridge, MA: MIT Press, 81-110.

Joergensen, Ulrik. 2012. "Mapping and Navigating Transitions—The Multi-Level Perspective Compared with Arenas of Development." *Research Policy* 41 (6): 996-1010.

Karapin, Roger. 2014. "Wind-Power Development in Germany and the United States: Structural Factors, Multiple-Stream Convergence, and Turning Points." In *State and Environment: The Comparative Study of Environmental Governance*, Andreas Duit, Cambridge, MA: MIT Press, 111-146.

Kemp, René., Johan Schot, and Remco Hoogma. 1998. "Regime Shifts to Sustainability through Processes of Niche Formation: The Approach of Strategic Niche Management." *Technology Analysis and Strategic Management* 10 (2): 175-196

Kenkmann, Tanja, Christof Timpe, Veit Bürger, Katja Schumacher, Wiebke Zimmer, and Christian Neumann. 2011. "Freiburg 2050 - Auf dem Weg zur Klimaneutralität. Abschlussbericht." Freiburg: Öko-Institut (Institute for Applied Ecology). http://www.freiburg.de/pb/site/Freiburg/get/291387/KlimaneutraleKommune_Schlussbericht.pdf (July 22, 2015).

Keppler, Dorothee. 2013. *Handlungsmöglichkeiten regionaler Akteure beim Ausbau erneuerbarer Energien. Grenzen regionalwissenschaftlich fundierter Empfehlungen und Erweiterungsmöglichkeiten durch techniksoziologische Konzepte*. Berlin: Technical University Berlin.

Kern, Kristine, and Gotelind Alber. 2008. "Governing Climate Change in Cities: Modes of Urban Climate Governance in Multi-Level Systems." In *Competitive Cities and Climate Change*. OECD Conference Proceedings, Milan, 9-10 October 2008: 171-196.

Kern, Kristine, Niederhafner, Stefan, Rechlin, Sandra, & Wagner, Jost. 2005. *Kommunaler Klimaschutz in Deutschland: Handlungsoptionen, Entwicklung und Perspektiven.* WZB Discussion Paper No. SP IV 2005-101. Berlin: Social Science Research Center Berlin.

Khan, Jamil. 2013. "What Role for Network Governance in Urban Low Carbon Transitions?" *Journal of Cleaner Production* 50:133-139.

Kingdon, John W. 1984. *Agendas, Alternatives, and Public Policies.* Boston, MA: Little Brown.

Klingenfeld. Daniel. 2012. *On Strategies for Avoiding Dangerous Climate Change: Elements of a Global Carbon* Market. Münster: LIT Verlag.

KomMA-P. 2015. "Energiewende." KomMA-P. Akzeptanz der Energiewende stärken. http://www.energiewende-akzeptanz.de/glossar/ (July 26, 2015).

Krekeler, Martin, and Thomas Zimmermann. 2014. "Politikwissenschaftliche Forschungsheuristiken als Hilfsmittel bei der Evaluation von raumbedeutsamen Instrumenten." In *Raumentwicklung 3.0 - Gemeinsam die Zukunft der räumlichen Planung gestalten: 15. Junges Forum der ARL 6. bis 8. Juni 2012 in Hannover*, Patrick Küpper, Meike Levin-Keitel, Friederike Maus, Peter Müller, Sara Reimann, Martin Sondermann, Katja Stock and Timm Wiegand (eds.), Hannover: Akademie für Raumforschung und Landesplanung (ARL) - Leibniz-Forum für Raumwissenschaften, 74-90.

Kronsell, Annica. 2013. "Legitimacy for Climate Policies: Politics and Participation in the Green City of Freiburg." *Local Environment* 18 (8):965-982.

Loorbach, Derk. 2010. "Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework." *Governance* 23 (1):161–183.

Lowndes, Vivien. 2010. "The Institutional Approach." In *Theories and Methods in Political Science*, David Marsh and Gerry Stoker (eds.), New York, NY: Palgrave, 60-79.

March, James G. und Johan P. Olsen. 1989. *Rediscovering Institutions: The Organizational Basis of Politics.* New York: Free Press.

March, James G. und Johan P. Olsen. 2008. "Elaborating the "New Institutionalism"." In *The Oxford Handbook of Political Institutions*, Rhodes, Rod A., Sarah A. Binder, and Bert A. Rockman (eds.), Oxford: Oxford University Press, 2008, 3-20.

Margolis, Robert, and Jarett Zuboy. 2006. *Nontechnical Barriers to Solar Energy Use: Review of Recent Literature*. Golden, CO: National Renewable Energy Laboratory.

Marsh, David, and Furlong, Paul. 2010. "A Skin Not a Sweater: Ontology and Epistemology in Political Science." In *Theories and Methods in Political Science*, David Marsh and Gerry Stoker (eds.), New York, NY: Palgrave, 184–211.

Mayntz, Renate, and Fritz Wilhelm Scharpf (eds.). 1995. *Gesellschaftliche Selbstregelung und politische Steuerung*. Frankfurt: Campus Verlag.

Mayring, Philipp. 2008. *Qualitative Inhaltsanalyse. Grundlagen und Techniken.* Basel: Beltz Verlag.

McKibben, Bill. 2007. *Deep Economy: The Wealth of Communities and the Durable Future.* New York, NY: Times Books.

Meinshausen, Malte, Nicolai Meinshausen, William Hare, Sarah C. B. Raper, Katja Frieler, Reto Knutti, David J. Frame, and Myles R. Allen. 2009. "Greenhouse-Gas Emission Targets for Limiting Global Warming to 2 C." *Nature* 458 (7242):1158-1162.

Millard-Ball, Adam. "Do City Climate Plans Reduce Emissions?" *Journal of Urban Economics* 71 (3): 289-311.

Moloney, Susie, and Ralph Horne. "Low Carbon Urban Transitioning: From Local Experimentation to Urban Transformation?" *Sustainability* 7 (3):2437-2453.

Monstadt, Jochen. 2007. "Urban Governance and the Transition of Energy Systems: Institutional Change and Shifting Energy and Climate Policies in Berlin." *International Journal of Urban and Regional Research* 31 (2):326-343.

Moss, Timothy. 2014. "Socio-Technical Change and the Politics of Urban Infrastructure: Managing Energy in Berlin between Dictatorship and Democracy." *Urban Studies* 51 (7):1432-1448.

Mouffe, Chantal. 2005. *On the Political*. New York, NY: Routledge.

Nilsson, Måns, Lars J. Nilsson, Roger Hildingsson, Johannes Stripple, and Per Ove Eikeland. 2011. "The Missing Link: Bringing Institutions and Politics into Energy Future Studies." *Futures* 43 (10):1117-1128.

Norn, Peter A. 2014. "Urban Political Leadership as Entrepreneurial Political Leadership: Changing Modes of Governance in the Case of Aarhus Ø". Paper presented to the European Consortium for Political Research. Glasgow, September 2014. http://ecpr.eu/Filestore/PaperProposal/c9ee22c1-9743-44b7-9990-5f9f1a50be58.pdf (July 22, 2015).

Olivier, Jos G.J., Greet Janssens-Maenhout, Marilena Muntean, Jeroen A.H.W. Peters. 2014. *Trends in Global CO2 Emissions: 2014 Report.* The Hague: PBL Netherlands Environmental Assessment Agency. http://edgar.jrc.ec.europa.eu/news_docs/jrc-2014-trends-in-global-co2-emissions-2014-report-93171.pdf (July 26, 2015).

Ostrom 1990. *Governing the Commons: The Evolution of Institutions for Collective Action.* New York, NY: Cambridge University Press.

Ostrom, Elinor. 2011. “Background on the Institutional Analysis and Development Framework.” *Policy Studies Journal* 39 (1):7-27.

Paech, Niko. 2012. *Befreiung vom Überfluss. Auf dem Weg in die Postwachstumsökonomie.* München: Oekom.

Pierson, Paul 2000. “Increasing Returns, Path Dependence, and the Study of Politics.” *American Political Science Review* 94 (2):251–267.

Purvis, Andrew. 2008. “Is this the Greenest City in the World?“ *The Guardian*, 23 March 2008. http://www.theguardian.com/environment/2008/mar/23/freiburg.germany.greenest.city (July 22, 2015).

Quitzau, Maj-Britt, Jens Stissing Jensen, Morten Elle, and Birgitte Hoffmann. 2013. "Sustainable Urban Regime Adjustments." *Journal of Cleaner Production* 50:140-147.

Radaelli, Claudio M., Bruno Dente, and Samuele Dossi. 2012 "Recasting Institutionalism: Institutional Analysis and Public Policy." *European Political Science* 11 (4):537-550.

Raven, Rob. 2011. "Analyzing Emerging Sustainable Energy Niches in Europe. A Strategic Niche Management Perspective." In Cities and Low Carbon Transitions, Bulkeley, Harriet, Vanesa Castán Broto, Mike Hodson, and Simon Marvin (eds.), Oxon: Routledge, 125-151.

Rotmans Jan, and Derk Loorbach. 2010. “Towards a Better Understanding of Transitions and Their Governance. A Systemic and Reflexive Approach.” In *Transitions to Sustainable Development – New Directions in the Study of Long Term Transformation Change*, Grin John, Jan Rotmans, and Johan Schot (eds.), New York, NY: Routledge, 105–220.

Rotmans, Jan, René Kemp, and Marjolein Van Asselt. 2001. “More Evolution than Revolution: Transition Management in Public Policy.” *Foresight* 3 (1):15-31.

Rutherford, Jonathan, and Olivier Coutard. 2014. "Urban Energy Transitions: Places, Processes and Politics of Socio-Technical Change." *Urban Studies* 51 (7):1353-1377.

Rutland, Ted, and Alex Aylett. 2008. "The Work of Policy: Actor Networks, Governmentality, and Local Action on Climate Change in Portland, Oregon." *Environment and Planning D: Society and Space* 26: 627-646.

Sabatier, Paul A. and Hank C. Jenkins-Smith (eds.). 1993. *Policy Change and Learning: An Advocacy Coalition Approach*. Boulder, CO: Westview Press.

Scharpf, Fritz W. 1997. *Games Real Actors Play: Actor-Centered Institutionalism in Policy Research.* Boulder, CO: Westview Press, 1997.

Scharpf, Fritz W. 2000a. *Interaktionsformen. Akteurzentrierter Institutionalismus in der Politikforschung.* Opladen: Leske & Budrich.

Scharpf, Fritz W. 2000b. “Institutions in Comparative Policy Research.” No. 00/3. *Max Planck Institute for the Study of Societies*, Cologne. (also published in: *Comparative Political Studies* 33 (6-7):762-790).

Schmidt, Vivien A. "Discursive Institutionalism: The Explanatory Power of Ideas and Discourse." Annual Review of Political Science 11: 303-326.

Schneidewind, Uwe, and Hanna Scheck. 2012. "Zur Transformation des Energiesektors–ein Blick aus der Perspektive der Transition-Forschung." In *Smart Energy. Wandel zu einem nachhaltigen Energiesystem*, Hans-Gerd Servatius, Uwe Schneidewind, and Dirk Rohlfing, Berlin: Springer, 45-61.

Schreurs, Miranda A. 2008. "From the Bottom Up: Local and Subnational Climate Change Politics." *The Journal of Environment & Development* 17 (4):343-355.

Schwartz, Elizabeth. 2012. "The Making of Climate Change Policy in Vancouver and Toronto: A Comparative Analysis." Paper Presented to the Canadian Political Science Association. Edmonton, June 2012. http://www.cpsa-acsp.ca/papers-2012/Schwartz.pdf (July 22, 2015).

Seyfang, Gill, Alex Haxeltine, Tom Hargreaves, and Noel Longhurst. 2010. “Energy and Communities in Transition: Towards a New Research Agenda on Agency and Civil Society in Sustainability Transitions.” *CSERGE Working Paper EDM* No. 10-13.

Seyfang, Gill, Sabine Hielscher, Tom Hargreaves, Mari Martiskainen, and Adrian Smith. 2013. "A Grassroots Sustainable Energy Niche? Reflections on Community Energy Case Studies." *3S Working Paper* 21:1-32.

Sine, Wesley D., and Brandon H. Lee. 2009. "'Tilting at Windmills? The Environmental Movement and the Emergence of the U.S. Wind Energy Sector." *Administrative Science Quarterly* 54(1): 123-155.

Smith, Adrian, and Andy Stirling. 2010. "The Politics of Social-Ecological Resilience and Sustainable Socio-Technical Transitions." *Ecology and Society* 15 (1):1-13.

Smith, Adrian, Andy Stirling, and Frans Berkhout. 2005. "The Governance of Sustainable Socio-Technical Transitions." *Research Policy* 34 (10):1491-1510.

Späth, Harald, and Dirk Rohracher. 2011. "The 'Eco-Cities' Freiburg and Graz. The Social Dynamics of Pioneering Urban Energy and Climate Governance". In *Governing the Energy Transition: Reality, Illusion or Necessity?,*Verbong, Geert, and Derk Loorbach (eds.), Oxon: Routledge, 2012, 88-106.

Späth, Philipp, and Harald Rohracher 2014. "The Interplay of Urban Energy Policy and Socio-technical Transitions. The Eco-Cities of Graz and Freiburg in Retrospect." *Urban Studies* 51 (7): 1415-1431.

Späth, Philipp, and Harald Rohracher. 2015. "Conflicting Strategies towards Sustainable Heating at an Urban Junction of Heat Infrastructure and Building Standards." *Energy Policy* 78:273-280.

Spekkink, Wouter, Jasper Eshuis, Chris Roorda, Marian Stuiver, And Frank Van Steenbergen. 2013. "Transition Management at the Local Scale. An Analysis Of Challenges in Transition Management at the Local Scale in Two Case Studies." *Policy and Society* 3 (2):87-96.

Swyngedouw, Erik. 2009. "The Antinomies of the Postpolitical City: In Search of a Democratic Politics of Environmental Production." *International Journal of Urban and Regional Research* 33 (3):601-620.

Szarka, Joseph. 2010. "Bringing Interests Back In: Using Coalition Theories to Explain European Wind Power Policies." *Journal of European Public Policy* 17 (6):836–53.

Thorpe, David. 2014. "The World's Most Successful Model for Sustainable Urban Development?" *Sustainable Cities Collective.* February 28, 2014. http://www.sustainablecitiescollective.com/david-thorpe/229316/words-most-successful-model-sustainable-urban-development (July 26, 2015).

Treib, Oliver. 2015. "Akteurszentrierter Institutionalismus." In *Handbuch Policy-Forschung*, Georg Wenzelburger, and Reimut Zohlnhöfer, Wiesbaden: Springer Fachmedien, 277-304.

Tsebelis, George. 1990. *Nested Games: Rational Choice in Comparative Politics.* Berkeley, CA: University of California Press.

UNEP. 2011. *Cities – Investing in Energy and Resource Efficiency.* United Nations Environment Programme. http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_12_Cities.pdf (July 22, 2015).

Unfried, Peter. 2011. "Unter Ökos." *die tageszeitung*, 14 May 2011. http://www.taz.de/1/archiv/digitaz/artikel/?ressort=hi&dig=2011%2F05%2F14%2Fa0027 (July 26, 2015).

Van den Bergh, Jeroen C. 2011. „Environment versus Growth—A Criticism of "Degrowth" and a Plea for "A-Growth." *Ecological Economics* 70 (5): 881-890.

Vaughan, Adam. 2009. "Carbon Emissions per Person, by Country. Greenhouse Gas Emissions Datablog." *The Guardian*, 2 September 2009. http://www.theguardian.com/environment/datablog/2009/sep/02/carbon-emissions-per-person-capita (July 26, 2015).

Verbong, Geert, and Derk Loorbach. 2012. "Conclusion. Is Governance of the Energy Transition: a Reality, an Illusion or a Necessity?" In *Governing the Energy Transition: Reality, Illusion or Necessity?,*Verbong, Geert, and Derk Loorbach (eds.), Oxon: Routledge, 2012, 317-335

Victor, Peter A. 2011. "Growth, Degrowth and Climate Change: A Scenario Analysis." *Ecological Economics* 84:206–212.

Vromen, Ariadne. 2010. "Debating Methods: Rediscovering Qualitative Approaches." In *Theories and Methods in Political Science*, David Marsh and Gerry Stoker (eds.), New York, NY: Palgrave, 249-266.

Weible, Christopher M., and Dallas Elgin. 2013. "Contrasting Capacities from City to International Levels of Government in Addressing Climate And Energy Issues." *Cityscape: A Journal of Policy Development and Research* 15 (1):163-179.

Wikipedia. 2015. "Freiburg im Breisgau." https://de.wikipedia.org/wiki/Freiburg_im_Breisgau#Wirtschaft_und_Infrastruktur (July 26, 2015).

Wolf, Simon. 2013. *Climate Politics as Investment: From Reducing Emissions to Building Low-Carbon Economies*. Wiesbaden: Springer Science & Business Media.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford: Oxford University Press.

Yin, R., 2009. *Case Study Research Design and Methods*. Thousand Oaks, CA: Sage Publications.

Appendix A-D

Appendix A

Graphics and Figures

Cover Page created by using the following websites:

http://europeangreens.eu/climatecampaign/freiburg

http://www.amazon.de/Games-Real-Actors-Play-Institutionalism/dp/0813399688

http://uuministryforearth.org/files/2013-ED-Why-Cities.jpg

https://www.cleanenergywire.org/sites/default/files/styles/dossier_background/public/images/dossier/backgrounds/neckarwestheim-demonstration-energiewende-jetzt-20120311-22-c-buendnis-90-gruene-bw-wikipedia.jpg?itok=R1WXffDz (August 3, 2015)

Figure 1: Actor-Centered Institutionalism, Parto (2003)

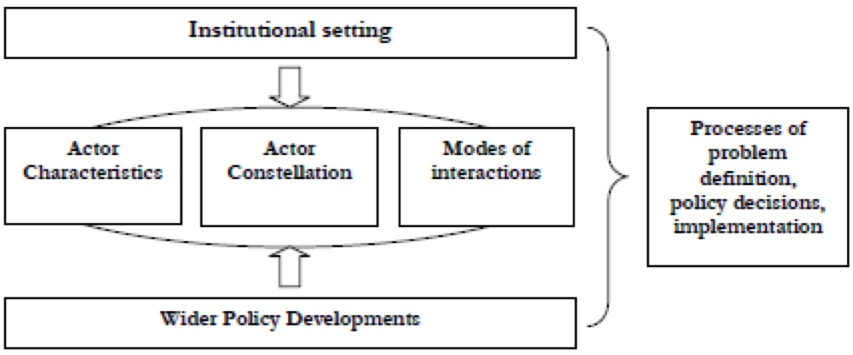

Figure 2.1: Actor-centred institutionalism based on Scharpf (1997: 44).

Figure 2: Freiburg Timeline, Fastenrath (2015)

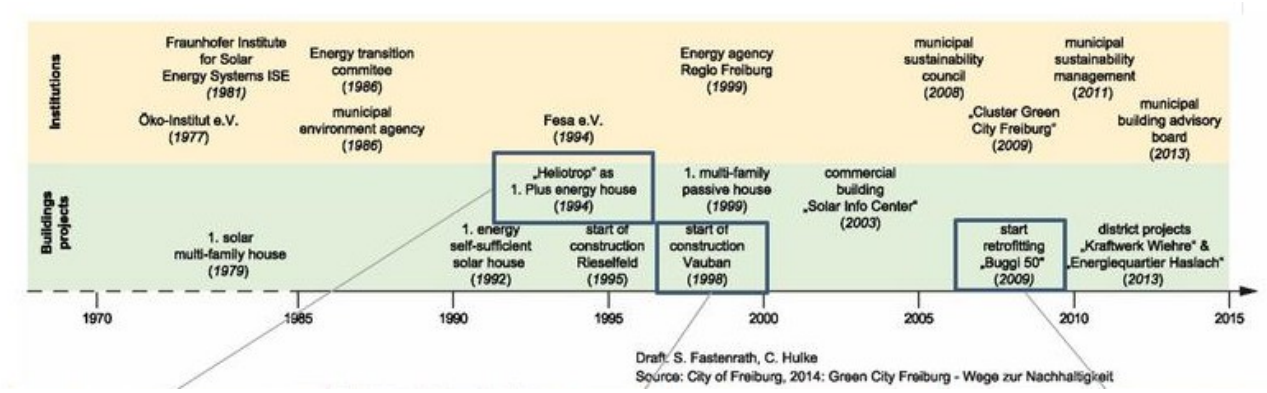

Figure 3: Aereal View of Vauban, City of Freiburg 2015a

Appendix B

Interview List of Questions

Linus Platzer
WWU Münster/ University of Twente
BA Research: The Politics of Urban Energy Transitions -
Analyzing the Green City Freiburg and its Political Actors

Interview Partner: **Interview Date:**

Anfrage:
Ihre Position im Kontext der Freiburger Energiewende und Ihre Einschätzung in Hinblick auf die Akteure und Entscheidungen in der Stadt
Request:
Your position in the context of the energy transition in Freiburg and your evaluation reagrding actors and decisions in the city

Interviewleitfaden (Fragen auf Deutsch): I*nterview Guidline (Questions asked in German):*

Überblick über Position und Akteure *Position and Actor Overview*

1. Welche Position haben Sie und Ihre Organisation im Kontext der Freiburger Energiewende? Seit wann sind Sie in diesem Umfeld beschäftigt? *What position do you and your organization have in the context of energy transition in Freiburg? Since when have you worked in this context?*
2. Wer sind die relevanten Akteure der städtischen Energiewende in Freiburg? Welche anderen Akteure gibt es? Welche Akteure sind etabliert, welche sind relativ neu? *Who are the relevant actors of the urban enery transition in Freiburg? What other actors are there? Which actors are established, which ones are relatively new?*
3. Inwieweit kooperieren Sie mit anderen Akteuren? *To what degree do you cooperate with other actors?*
4. Welche Entscheidungen waren für die Energiewende in Freiburg bedeutend? *Which decisions were important for the energy transition in Freiburg?*
5. Welche grundlegenden Konflikte gibt es zwischen den verschiedenen Akteuren? *What basic conflicts are there between the different actors?*

6. Was bedeutet für Sie *Akteure* der Energiewende? Bezieht sich der Begriff in Ihrem Verständnis eher auf organisierte Gruppen, Individuen oder offizielle RepräsentantInnen? Was bedeutet für Sie *Institution*? Bezieht sich der Begriff in Ihrem Verständnis eher auf staatliche oder nicht-staatliche Organisationen, kulturelle Werte oder ein regelndes Rahmenwerk? *What do you understand by* actors *in energy transitions? Does the term apply more to organized groups, individuals, oder official representatives? What do you understand by* institution*? Does the term aply more to state or non-state organizations, cultural values, or a framework of rules?*
7. Was bedeutet für Sie *Energiewende*? Was bedeutet *städtische Energiewende*? Können wir in Freiburg von einer Energiewende sprechen? Wenn nicht, wovon dann? *What do you understand by* energy transition*? What does* urban energy transition *mean? Can we speak of an energy transition in Freiburg? If not, what is it?*

8. Inwieweit kooperieren die Akteure in Freiburg in der Umsetzung der Energiewende? *To what extent do actors cooperate in the implementation of the energy transition in Freiburg?*
9. Gibt es Akteure, die ein Interesse daran haben, dass weniger ambitionierte Ziele umgesetzt werden? *Are there actors who are interested in implementing less ambitious goals?*
10. Wie viel Entscheidungsgewalt hat die Stadtverwaltung? Wie viel hängt von mehreren Entscheidungsträgern ab? Welche Beschlüsse werden in Gremien beschlossen? *How much decision power does the city administration have? How much does depend on multiple decision-makers? Which decisions are made in governing bodies?*
11. Gibt es Akteure, die dazu beigetragen haben, dass die Energiewende stärker als Aufgabe der Stadt wahrgenommen wird? *Are there actors which have contributed to an increased perception that the energy transition is a municipal task?*
12. Inwieweit hängt die Umsetzung der Energiewende vom politischen Willen und der politischen Arbeit von relevanten lokalen Akteuren ab? *To what degree does the implementation of the energy transition depend on political will and political action of relevant local actors?*
13. Inwieweit ist die Umsetzung der Energiewende abhängig von äußeren Faktoren, die städtische Akteure nicht beeinflussen kann? *To what extent is the implementation of the energy transition dependent on external factors which urban actors cannot influence?*

14. Was ist an Freiburg besonders, was anderswo nicht so ist? *Is there anythin special about Freiburg compared to elsewhere?*
15. Möchten Sie noch etwas anmerken? *Do you want to add anything?*

Informed Consent Information

This interview is part of University of Muenster and University of Twente student Linus Platzer's research project in fulfillment of the Bachelor's Thesis. Your participation is completely voluntary. Your responses will be used to compile information about the different perspectives held on local, energy transitions, actors and institutions and their roles, and environmental politics.

Your responses in this interview will be confidential if wished. If permitted, the interview will be used for future research. This interview will be audio recorded for accuracy. A transcript will be made of each interview and used analyzing the content. Each transcript will be labeled with a code such as "1", "2", etc. Though an unlikely topic, any personal information not relating to the research question discussed in the interviews will be omitted from research.

Your verbal consent made at the beginning of the interview is proof authorizing that you have been informed of the nature of this research and that you understand that your participation is completely voluntary.

Thank you for your participation in this research and your consideration of this research request.

Appendix C

Provisional Operationalization of Indicators

Capabilities of actors and their perceptions:

- ≅ relevant or not (citizen groups? political parties?)
- ≅ administrative power or not (city leaders)
- ≅ being part of steering group
- ≅ resources
- ≅ advocates of ecological modernization paradigm or more radical,
- ≅ what ambitions towards the 'Green City'

Interaction orientations:

- ≅ (individualism/solidarity/competition)
- ≅ visible transaction costs
- ≅ ethical arguments advanced for the own cause
- ≅ scientific arguments for the own cause

Actor constellations:

- ≅ connections and collaboration in working groups
- ≅ single-actor constellations vs. multi-actor constellations
- ≅ 'relevant' actors

Interaction modes:

- ≅ (mutual adjustment/negotiated agreement/(majority) voting/hierarchical direction/shadow of hierarchy?)
- ≅ decisions made
- ≅ governance setting

Appendix D

Declaration of Academic Integrity

I hereby confirm that the present bachelor thesis

The Politics of Urban Energy Transitions - Analyzing the 'Green City' Freiburg and its Political Actors

is solely my own work and that if any text passages or diagrams from books, papers, the Web or other sources have been copied or in any other way used, all references –including those found in electronic media –have been acknowledged and fully cited.

Münster, August 4th, 2015