Institutional path creation in emerging regional fields: The case of electromobility in the Berlin region

ABSTRACT

This paper examines processes of institutional path creation in emerging regional fields that are forming around new issues. Although path dependence is commonly seen as a fundamental feature of the economic landscape, only little research asks where regional paths originally come from and more precisely, how new place-specific institutions are created. Consequently, path creation processes in the early stages of regional institutional emergence have been by and large overlooked or neglected. Informed by neoinstitutional theory, this paper introduces the regional field as a promising level of analysis to study both the emergence of regional institutions and the role of collective entrepreneurship within these processes before the formation of an already institutionalized space, e.g. an industry cluster. Summing up the conceptual arguments, this paper provides a basic three-stage model of regional field formation by taking a path creation perspective. The first phase of this model is illustrated by a case description of the emerging field that is forming around the issue of electromobility in the Berlin region. As a preliminary finding, it is argued that organizing regional anchoring of this new issue can be considered as an important prerequisite to generate momentum for new institutional paths within this emerging field.

Keywords: regional fields, institutional path creation, electromobility, Berlin region

INTRODUCTION

A region's specific institutional endowment is generally seen as an impetus for its competitiveness and economic performance (Storper 1997; Maskell & Malmberg 1999; Porter 2000). This insight can at least be traced to the writings of nineteenth-century economist Alfred Marshall and his observation that certain places or regions benefit from their specific "industrial atmosphere" (1890). In the recent past, the notion of regional path dependence has evoked as a central theoretical building block in the regional science literature in general and economic geography in particular (Boschma & Lambooy 1999; Lagerholm & Malmberg 2009; Coe 2010; Martin & Sunley 2010). Not only is path dependence commonly seen as a fundamental feature of the economic landscape but also to a large extent a place dependent phenomenon (Martin & Sunley 2006). The location of industries and the spatial distribution of economic activities serve as classical examples of path dependence arguments evident in the writings of one of the theory's founding father Brian Arthur (1994). Accordingly, Krugman states: "If there is one single area of economics in which path dependence is unmistakable, it is in economic geography - the location of production in space. The long shadow cast by history over location is apparent at all scales, from the smallest to the largest" (1991: 80).

While several empirical studies have convincingly demonstrated the lock-in of old industrial regions such as the coal and steel complex in the Rhine-Ruhr area (Grabher 1993), automobile production in the Stuttgart region (Fuchs & Wassermann 2005) or shipbuilding in northern Germany (Hassink 2005), it is increasingly acknowledged that path dependent processes also have a number of desirable features (Sydow, Lerch, Staber 2010), at least for emerging clusters that are still in the making (Feldman & Braunerhjelm 2006; Powell, Packalen, Whittington 2010). Accordingly, regional path dependence is perceived as

fundamentally ambivalent (Martin & Sunley 2006). More often than not, the success of regional clusters such as Silicon Valley is explained by path dependent dynamics once the development of place-specific institutions is reinforced by positive feedback loops (Kenney & von Burg 1999). Most notably, untraded interdependencies (Storper 1997) and institutional thickness (Amin & Thrift 1994) as particular types of localized capabilities (Maskell & Malmberg 1999) are seen as driving forces for regional economic evolution.

In this paper, it is argued that the existing literature in the regional sciences puts too much emphasis on the contingent effects of already institutionalized spaces on regional economic evolution while processes of organizing these spaces remain by and large overlooked or neglected. Following Menzel, Henn and Fornahl this applies particularly for research on industry clusters: “Though the strong research focus on the functionality of clusters has without doubt resulted in a profound knowledge about the processes occurring within regional clusters, it has largely involved a disregard of the questions how spatial concentrations actually come into being and how they gradually develop” (2010: 1). Predominantly, initial location choices of new industries have been explained as a purely random phenomenon which subsequently may result in geographical clustering processes driven by path dependent dynamics (Krugman 1991; Arthur 1994). Even though it has been argued that the emergence of new industries opens up a “window of locational opportunity” where “industries create regional resources and not the other way around” (Storper & Walker 1989: 96), the role of agentic processes that underlie regional institution building did not receive much attention in the regional science literature thus far (Cooke 2010). Hence, the general aim of this paper is to shed light on the initial stage of regional institutional emergence by taking a path creation perspective.

This paper is structured as follows. First, the regional field is introduced as a promising level of analysis to study the emergence of regional institutions at a stage where an industry cluster has not yet emerged (or eventually never will). To do so, the originally geography-independent notion of organizational fields is borrowed from neoinstitutional theory as the main level of analysis (DiMaggio & Powell 1983; Hoffman 1999; Scott 2008) to develop the idea of regional fields that form around new issues. Informed by the institutional entrepreneurship literature, a basic understanding of the collective processes that underlie the creation, destruction and maintenance of place-specific institutions is provided. Subsequently, this paper adopts a processual view on regional field formation informed by path related arguments (David 1985; Arthur 1989; Sydow, Schreyögg, Koch 2009). In the second section, the specific dynamics of regional institution building are summarized in a basic model of regional field formation by taking up a path creation perspective (Garud & Karnoe 2001). In the empirical part of this paper, the first phase of this proposed model is illustrated by a case description of the emerging field that is forming around the issue of electromobility in the Berlin region. This paper concludes with a short discussion in the final section.

THEORY

The conceptual part of this paper consists of three sections. In the first section, the notion of regional fields is introduced. It is argued that geographical spaces such as industrial districts, learning regions or industry cluster "may be specified as particular types of organizational fields, i.e. fields that are characterized by spatial agglomeration, intensive inter-organizational interaction and shared understandings" (Sydow 2006: 492). In the second section, the role of institutional entrepreneurship in the early stage of regional field genesis is discussed. An overview of path dependence arguments follows in the third section.

Regional fields

The importance of place-specific institutions for a region's competitiveness and economic evolution is widely acknowledged within the field of regional science and economic geography (Maskell & Malmberg 1999; Lagerholm & Malmberg 2009). Albeit an institutional perspective on regional economic development has recently been advocated (Amin 1999; Martin 2000) only little research makes explicit reference to neoinstitutional approaches to organizational theory in general and the concept of organizational fields in particular. Nonetheless, there are several hints and implicit references in the regional science literature that may justify the attempt to apply the field concept at the regional level.

The extensive literature on regional clusters (for a critical review see Martin & Sunley 2003) increasingly points to the fact that the emergence and existence of clusters cannot be fully understood without giving attention to social institutions. Emphasizing the importance of formal institutions, Porter defines a geographic cluster as "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities" (2000: 254). As a notable exception within cluster research, Pouder and St. John (1996) explicitly refer to the neoinstitutional notion of organizational fields indicating that geographically clustered firms in "hot spots" may also be exposed to institutional pressures from the regional environment. By the same token, the literature on regional innovation systems (Cooke 2001, 2004) highlights the supporting role of an institutional infrastructure for innovation and localized learning processes within the production structure of a region (Asheim & Gertler 2005). Thus, Heidenreich (2005) suggests that regional innovation systems may be seen as institutionalized "social fields".

By and large, one can state that the regional science literature did not make full use of the potential of the field concept thus far. One reason that the concept of organizational fields could not attract much attention in the regional science literature may be due to the fact that the concept itself has been conceived as explicitly geography-independent (Scott 2008). Interestingly enough, there is a growing awareness of organizational scholars on the enduring influence of local communities on organizations despite globalization forces (Marquis & Battilana 2009) as organizations are simultaneously embedded in geographic communities and organizational fields (Lounsbury 2007; Marquis, Glynn, Davis 2007). Furthermore, the role of geographical proximity is highlighted as a critical feature for the emergence and development of organizational fields. This is what Powell, Packalen and Whittington have termed the "puzzle of space" in the early stages of field genesis taking the Biotech Field in the United States as an empirical example (2010). In a recent review, Greenwood et al. claim that the recognition of geographic communities became rather lost in institutional theory: "However, organizations are not only set within a field, they are also located within communities. Only recently has institutional work begun to acknowledge that communities may influence the particular expression of rationalized myths and institutional logics to which organizations have to respond" (2008: 30).

Institutions as carriers of history (David 1994) are enduring features of social life (Giddens 1984) and are composed by regulative, normative and cultural-cognitive elements that provide stability and meaning (Scott 2008). Various definitions in the neoinstitutional literature point to the relational character as a constitutive element of institutions, thus the role of interaction pattern between social actors is emphasized (Barley & Tolbert 1997). Following Jepperson, an institution represents a social order or pattern that reflects a set of "standardized interaction sequences" (1991: 145). North defines institutions as "humanly devised constrains that structure political, economic and social interaction" (1990: 97). In a similar vein,

Fligstein state that institutions as rules and shared meanings define social relationships and positions and guide interaction between social actors (2001: 108). More often than not institutions are considered to be geographically-independent. Though, taken-for-granted institutions operate across time and space (Giddens 1984: 24). Thus, place-specific institutions may also affect the actions of organizations embedded in geographically-defined fields. As Scott himself points out, institutions "operate as multiple levels - from the world system to interpersonal interaction" (2008: 50). Though, he does not explicitly refer to the regional or community level.

In line with neoinstitutional theory, the locus of interaction between legitimacy seeking social actors is the organizational field (see Sydow 2006 and Wooten & Hoffman 2008 for recent overviews). In their early writings DiMaggio and Powell indicate that an organizational field only exists to the extent that it is already institutionally defined. An organizational field includes "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produces similar services or products" (1983: 148). The process of field structuration consists of four parts: interactions among organizations increase, structures of domination and patterns of coalition emerge, the information load of the field increases and a mutual awareness of being involved in a common enterprise develops between field members. Hence, a high degree of field structuration leads to isomorphism driven by coercive, mimetic and normative mechanisms (DiMaggio & Powell 1983).

Informed by this early conceptualization of organizational fields, Amin and Thrift (1994) introduced the term "institutional thickness" to the regional science community. They isolate four similar factors that contribute towards the construction of a regional field: A

strong presence of regional institutions provides a collective representation and supports the growth of specific local practices; high levels of interaction serve to constitute a localized social atmosphere; the development of structures of domination and patterns of coalition serves to socialize costs and controls for adequate behavior among the regions firms and organizations; finally, the awareness of regional actors that they are involved in a common enterprise often leads to a formulation of a commonly held regional industrial agenda. In sum, the writings of Amin and Thrift clearly indicate the applicability of the field concept at the regional level. Though, they state: “it is apparent that in many cases we know very little about the institutional field of local areas” (1994: 19).

In neoinstitutional theory much emphasis is placed on interactions between field members. Generally speaking, fields can be conceived as “relational spaces” (Wooten & Hoffman 2008) where disparate organizations interact and involve themselves with one another. At these sites, problems of organizing are debated among formerly distant actors. The relational aspect of fields is also reflected in Scott’s definition: “The notion of fields connotes the existence of a community of organizations that partakes of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field” (2008: 86).

In other words, a high degree of relational proximity between field members is a characteristic feature of organizational fields. In the regional sciences instead, the term proximity was primarily understood as a physically short distance between two geographical entities, thus focusing on geographical proximity only. As Boschma (2005) points out, the authors of the French School of Proximity Dynamics (Torre & Gilly 2000) broadened the concept when they proposed that the term proximity covers a number of distinctive relational dimensions as well. Basically, there is a growing consensus in the regional science literature

to employ a general twofold differentiation between the geographical and relational dimension of proximity. Whereas proximity and distance respectively address different types of divergence along the same continuum, the geographical and relational dimensions refer to different qualities of (dis)similarity (Ibert 2010). While some scholars even claim that geographical proximity is neither a necessary nor sufficient condition for learning, coordination or innovation to take place (Amin & Cohendet 2004), geographical proximity may indirectly affect these variables by strengthening the relational dimension of proximity. Thus, it plays a more complementary and indirect role (Boschma 2005). Unlike mature organizational fields, which are characterized by a low geographical proximity and a high relational proximity instead, regional fields are geographically bounded. Thus, geographical proximity is already given when co-located organizations and institutions engage in regional field structuration processes aiming at an increase of their relational proximity over time.

In the last decade or so, there is a growing awareness in the institutional literature that the field concept places too much emphasis on the homogeneity of organizations in already institutionalized organizational fields. Accordingly, the theoretical scope of the field concept is rather limited to an already "recognized area of institutional life" (DiMaggio & Powell 1983). As a consequence, such applications of the field concept lose sight of the processes that have created such outcomes (Hoffman 2001). While most work in this tradition implies that new practices spread through fields like "wild-fires" (Wooten & Hoffman 2008: 142), it has been pointed out that the early stage of field formation often resembles an "institutional vacuum" (Aldrich & Fiol 1994) where different interests and "blueprints for organizing" (Barley & Tolbert 1997) compete for adoption as actor relations are still fluid and regulations and practices in the field are still up for debate. Hence, the early stage of field formation should not be conceived as a steady or smooth process. Instead, this early stage may be better characterized as a period of "institutional war" (White 1992 as cited in Hoffman 1999).

To address these shortcomings, Hoffman defines organizational fields as "centers of debates in which competing interests negotiate over issue interpretation" (1999: 351). Accordingly, this reformulation of the field concept is more sensitive to processes that occur in emerging fields that are still in their infancy and does not exclusively focus on highly institutionalized fields and their influence on organizational behavior. At least three particular states of organizational fields may be distinguished. As a basic categorization, Fligstein points to fields that are forming, stable or in crisis (1997). Furthermore, Hoffman stresses that emerging organizational fields do not only form around markets or technologies but also around key issues or central disputes such as corporate environmentalism (1999). Leblebici, Salancik, Copay and King distinguish four dimensions to further operationalize organizational fields. They point to constellations of actors, technologies used in the field, established regulations and practices that characterizes the activities in the field (1991).

In sum, a working definition of regional fields should include the following elements: Unlike the conceptualization of organizational fields in neoinstitutional theory, a regional field has (1) *geographical boundaries*. A regional field forms around (2) *key issues* that emerge in geographically defined spaces. Furthermore, it includes (3) *the totality of relevant actors* within a certain region and it is characterized by (4) *frequent interaction* between these regional field members.

In addition, such an approach should be sensitive to the following insights: Regional fields are seen as a dynamic concept, thus (5) *distinct stages* of regional field formation should be taken into account. The concept should be applicable to an analysis of geographical spaces (6) *before* an institutionalized space has already emerged. Accordingly, an analytical focus may be on the (7) *emergence and stabilization* of regional actor constellations, technologies, regulations and regional practices.

Organizing regional institutional entrepreneurship

Institutional approaches to organizational theory have traditionally placed much emphasis on the constraining effects of institutions in mature organizational fields on organizational behavior (Barley & Tolbert 1997; Garud, Hardy, Maguire 2007; Greenwood et al. 2008). On the contrary, less research is concerned with the origins of the contours of fields and less emphasis is put on how fields emerge and develop in the first place. As Powell, Packalen, Whittington point out: "Much of the social science literature on institutions resembles a play that begins with the second act, taking both plot and narrative as an accomplished fact. Very little research asks how a play comes to be performed, or why this particular story is being staged instead of some other one" (2010).

DiMaggio's call to bring interest and agency back in into institutional theory paved the road for a growing body of literature based on his notion of "institutional work" (1988: 13). Lawrence & Suddaby define the terrain of institutional work as "the set of practices through which individual and collective actors create, maintain and disrupt the institutions of organizational fields" (2006). Even though processes of disrupting and maintaining institutions are equally important, this paper narrows its focus to the concept of institutional entrepreneurship to further understand the processes of new regional institution building in emerging regional fields. Institutional entrepreneurship is defined as "the activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones" (Maguire, Hardy, Lawrence 2004: 657). Agentic processes underlie the structuration of fields as "new institutions arise when organized actors with sufficient resources (institutional entrepreneurs) see in them an opportunity to realize interests that they value highly" (DiMaggio 1988: 14).

The creation of new institutions in emerging fields is a time-consuming effort (Garud, Hardy, Maguire 2007) and this process is increasingly seen as a collective endeavor (Möllering 2007). In many cases the mobilization and involvement of several different actors, so called "subsidiary actors" (DiMaggio 1988: 15), is needed to generate momentum for new institutional arrangements and fields. Thus, Hardy and Maguire point out: "Institutional entrepreneurship therefore seems to be predominantly a collective process" (2008: 209). In sum, the mobilization of a collective of "organized actors with sufficient resources" (DiMaggio 1988) can be considered as a precondition for regional institution building.

The scope for institutional entrepreneurship has been associated with the particular state of an organizational field (Fligstein 1997). Especially, emerging fields are likely to present opportunities for institutional entrepreneurship as they are characterized by a high degree of uncertainty and lack institutionalized practices (Maguire 2008). Thus, values and norms have to be developed and power is more diffuse: "In these contexts - where actors are only beginning to recognize themselves as belonging to a common enterprise, relations are fluid, meanings are heterogeneous, understandings are not widely shared, and multiple possible scripts for action exist - actors are motivated to stabilize relationships, meanings, and practices to reduce uncertainty for themselves and to facilitate development of the field in ways congruent with the realization of constructed interests that predate or are emerging with the field" (Hardy & Maguire 2008). In well-structured mature fields, the motivation for change is said to vary with the actor's position within the field (Maguire 2008). Nonetheless, both the role of peripheral actors (Leblebici, Salancik, Copay, King 1991) and incumbent actors (Greenwood & Suddaby 2006) for breaking old and creating new practices have been demonstrated. Furthermore, field members can also become motivated to change institutionalized practices when they are exposed to field-level crisis as a result of exogenous shocks such as the introduction of new technologies or regulatory change.

Planning for path dependence

The concept of path dependence has become a popular notion across a wide range of social science disciplines. It has developed into a frequently used approach to stress the enduring influence of past events on current and future action. The theoretical scope of the original argument put forward by David (1985) and Arthur (1989, 1994) goes well beyond the mere insight that history matters (Schreyögg & Sydow 2010). Instead, taking path dependence seriously implies focusing the analysis on how history matters for technology diffusion, institutional arrangements, business and innovation strategies or regional trajectories.

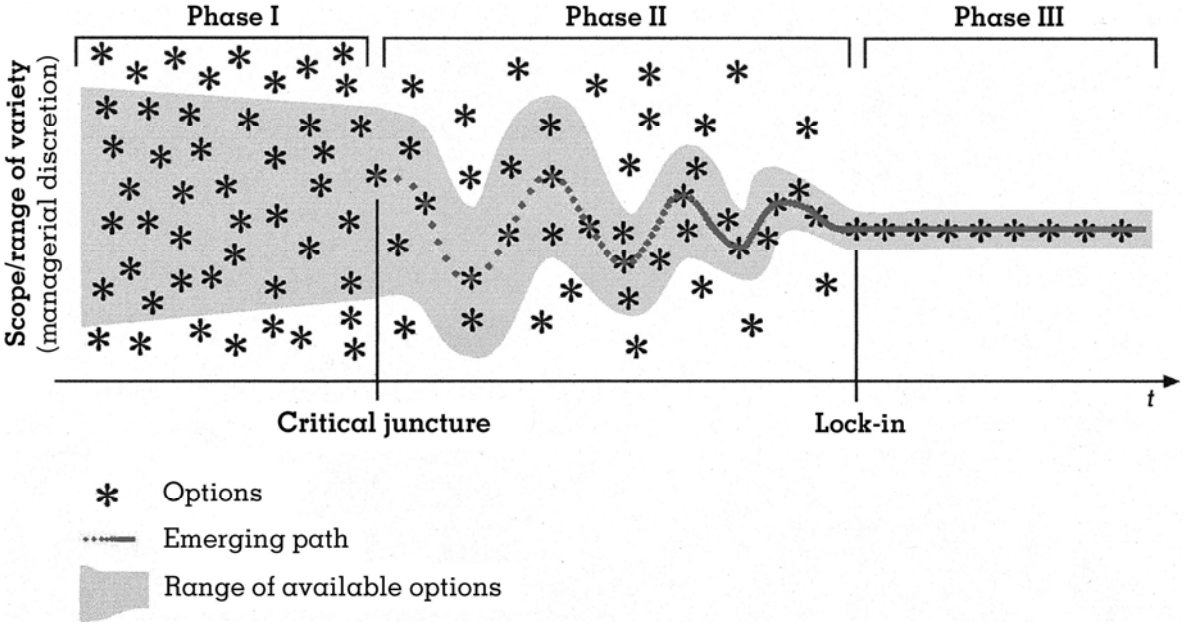
Path dependence arguments have been applied to various phenomena of inflexibility and resistance to change at different levels of analysis (see Pierson 2000; Martin & Sunley 2006; Sydow, Schreyögg, Koch 2009; Beyer 2010 for detailed overviews). It is most often linked to the QWERTY case on the emergence and persistence of the standard typewriter keyboard described by economic historian Paul David as the most prominent example of technological path dependence. David (1985) highlights the influence of temporary remote and chance events such as the inventor's trial and error rearrangements of the alphabetical key orderings for the diffusion of the technology that resulted in the lock-in of an inferior standard which has never been seriously challenged. The work of business mathematician and economist Brian Arthur provides a formal model on the central role of increasing returns in generating path dependence in the economy. Arthur (1994) highlights four key defining characteristics of path dependent processes. Ex ante, the result can not be predicted (non-predictability) as the outcome of path dependent processes evolves as a consequence of its own history (non-ergodicity). The inability to shake free of its own history implies that after a path starts to emerge actors are progressively locked to a single option (inflexibility) which might have only inferior long-run potential (potential inefficiency). Subsequently, the concept

has been taken up by scholars of other social science disciplines. North applied the idea of path dependence to the development of institutions reflected in his often cited quote that “the interdependent web of an institutional matrix produces massive increasing returns” (1990: 95). Scott picked up the increasing returns argument to emphasize the existence of path dependent dynamics that underlie certain processes of institutionalization (2008: 122).

The notion of regional path dependence (Martin & Sunley 2006) and the different forms of possible lock-ins evident in regional trajectories (Grabher 1993) are key ingredients of an evolutionary approach to regional sciences (Coe 2010). Ron Martin, whose publications heavily contributed to the diffusion of path dependence arguments in economic geography, stresses the path dependent character of place-specific institutions: “It is at the regional and local levels that the effects of institutional path dependence are particularly significant. Institutions are important “carriers” of local economic histories. Different specific institutional regimes develop in different places, and these then interact with local economic activity in a mutually reinforcing way. If institutional path dependence matters, it matters in different ways in different places: institutional-economic path dependence is itself place-dependent” (Martin 2000: 80).

Likewise, institutional arrangements at the organizational level tend to create path dependencies (Garud, Hardy, Maguire 2007). Accordingly, path dependence arguments entered into the wider discourse on change-inhibiting forces in the strategy and organization literature. Sticking close to the theoretical core with its emphasis on small events, self-reinforcing dynamics and lock-in, Sydow, Schreyögg and Koch (2009) set forth a general framework that subdivides the process of organizational path dependence into three distinct stages that are governed by different causal regimes (see Fig. 1).

Fig. 1: The constitution of an organizational path



Source: Sydow, Schreyögg, Koch 2009: 692

The preformation phase (phase I) is characterized by a broad scope of action which is increasingly narrowed after small events set off self-reinforcing processes at the moment of a critical juncture. Consequently, the formation phase (phase II) is governed by the regime of self-reinforcement. The pull of an evolving path favors a particular action pattern as positive feedback processes generate increasing benefits for individual actors. The flip side of these rents becomes evident in the third phase as the process can turn into an irreversible state of lock-in. Vergne and Durand extract the central elements and necessary conditions of path dependence in a narrow sense. They define path dependence "as a property of a stochastic process which obtains under two conditions (contingency and self-reinforcement) and causes lock-in in the absence of exogenous shock" (2010: 737). In short, the classical model of path dependence directs attention to small events that trigger self-reinforcing dynamics beyond the control of individual actors that can lead the process to an at least potentially inefficient state of lock-in. This view has recently been debated and criticized by Garud, Kumaraswamy,

Karnøe (2010) who offer an alternative view labeled path creation. Of particular attention is the transition period between the first and the second phase. There is still an ongoing discussion in path related research whether this moment of a critical juncture - where the evolving path starts to gain momentum - is mainly the result of emergence or purposive planning.

In the following, it is argued that collectives of actors can "deliberately plan for path dependence" (Sydow, Lerch, Staber 2010). By drawing on an interorganizational network in a German science-based industry cluster, Sydow, Lerch and Staber depart from the conventional view of path dependence and emphasize on the role of agentic processes that underlie path dependent dynamics. Coming from the perspective of structuration theory the authors state that planning for path dependence "aims at the explicit or implicit creation or maintenance of path dependence if it promises benefits that are larger than costs and the avoidance of path dependence if it is believed to lead to a negative lock-in" (2010: 175). This implies to call two central theoretical conditions implicit in the classical writings on path dependence into question. First, one has to depart from the conventional focus on serendipity in the preformation phase. By emphasizing human agency instead, the proposed concept is more sensitive to processes that are driven by both emergence and planning. Second, the predominant negative connotation of path dependent processes has to be reconsidered. These two arguments are set out in the following paragraphs.

Conventionally, the genesis of a path dependent trajectory is seen as a purely random phenomenon (Arthur 1989). The enduring influence of small events and "historical accidents" (David 1985: 332) can only be recognized ex post. Though, this view is increasingly put into question as these triggering events often turn out to be not so small and random (Bassanini & Dosi 2001) and can be triggered by strategies as well (Sydow, Schreyögg, Koch 2009), as

demonstrated in the VHS versus Beta case (Cusumano et al. 1992). The same holds true for industry location choices once the emergence of new industries opens a windows of locational opportunity: "…the spatial formation of new industries is not a deterministic process, but a process with an outspoken, although often unconscious influence of human agents, developing increasing returns in a local context" (Boschma & Lambooy 1999: 425). Form a path creation perspective initial conditions can even be mindfully constructed: "Mindfulness implies an ability to disembed from existing structures defining relevance and also an ability to mobilize a collective despite resistance and inertia that path creation efforts will likely to encounter. Indeed, entrepreneurship is a collective effort where paths are continually and progressively modified as new technological fields emerge" (Garud & Karnøe 2001: 2). Accordingly, path creation processes can be decomposed in three basic stages: mindful deviation, collective entrepreneurship and generating momentum.

Self-reinforcing dynamics are at the core of path dependent developments (Pierson 2000; Sydow, Schreyögg, Koch 2009). The importance of self-reinforcing mechanisms is acknowledged by both camps of scholars interested in path dependence and creation. The variety of mechanisms (Beyer 2010) is already apparent in the original work of David and Arthur. David (1985) points to technical interrelatedness, system scale economics and quasi-irreversibility as the main mechanisms that led to the self-reinforcement of the QWERTY layout. Arthur (1994) identified high initial or fixed costs, learning effects, coordination effects and adaptive expectations as mechanisms that give rise to increasing returns to adoption. In opposition to path dependence theory in a narrow sense, which sees self-reinforcing dynamics as mainly unfolding behind the back of individual actors, scholars of path creation argue that self-reinforcing processes or momentum can also be strategically manipulated and cultivated (Garud, Kumaraswamy, Karnøe 2010).

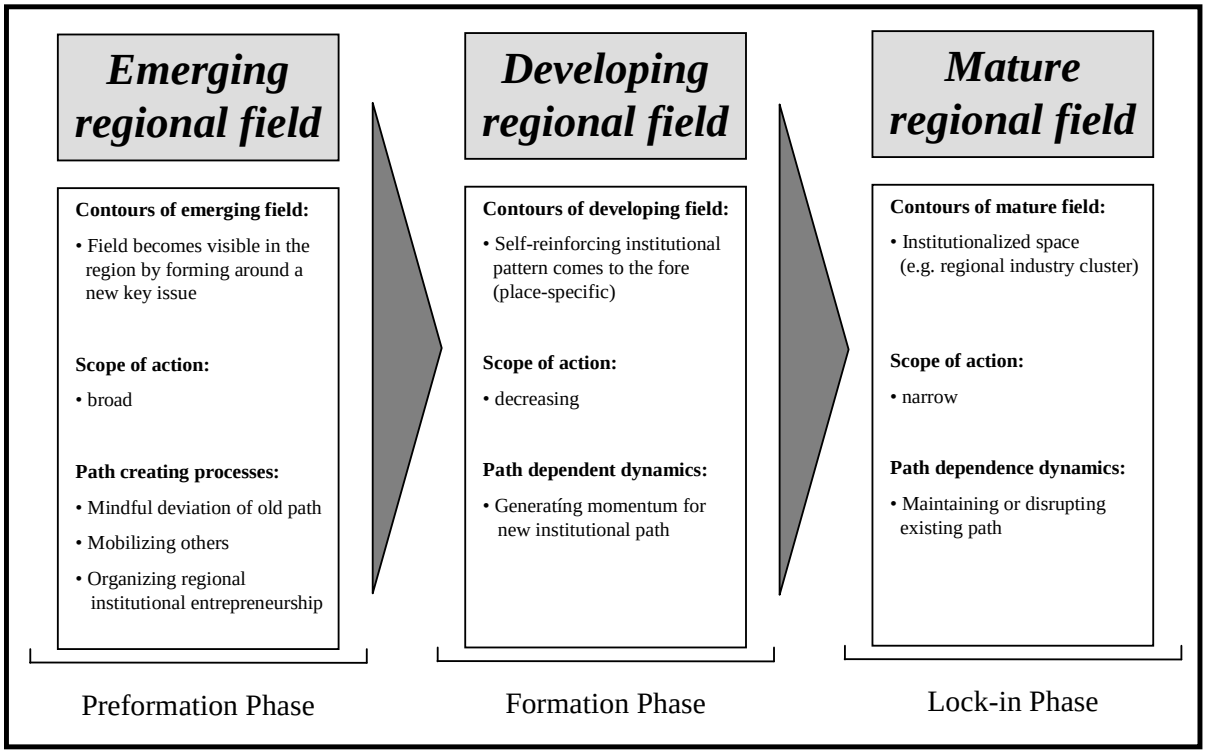
The predominant negative connotation of path dependence - especially the notion of lock-ins - attracted a great deal of attention and criticism. The “canonical model of path dependence” (Martin 2010) puts much emphasis on inferior lock-ins as inevitable outcomes of path dependent processes. Though, from a path as process perspective, a negative lock-in is only one possible outcome as inefficiency is seen as a matter of the latter stages only (Sydow, Schreyögg, Koch 2009). Despite the possibilities of lock-ins, it is increasingly acknowledged that path dependent dynamics also have a number of desirable features (Garud & Karnøe 2001; Martin & Sunley 2010). Individual actors may profit from creating a new or staying on an old path as positive feedback processes can accelerate development trajectories and keep growth on an intended track (Sydow, Lerch, Staber 2010). Likewise, a coordinating institution such as rule-guided behavior increases the efficiency of interactions, decreases coordination costs and reduces uncertainty. Similarly, interrelated activities in complementary settings produce synergies and an additional surplus. The same holds true for other social mechanisms such as learning or the interactive building of preferences that shape adaptive expectations (Sydow, Schreyögg, Koch 2009).

According to this line of reasoning, path dependent processes should be seen as fundamentally ambivalent (Martin & Sunley 2006). At least for cluster emergence it is important to distinguish between path dependence as a process and negative lock-in as one possible outcome. On the one hand, planning for path dependence by purposively setting in motion several reinforcing mechanisms promises increasing benefits for the involved actors as the process gains momentum. On the other hand, it is not ruled out that over time path dependent processes can trigger systemic dynamics that result in negative lock-in. Therefore, the non-ergodic outcome of path dependent processes - either as a result of emergence or purposive planning in the preformation phase - is always a consequence of its own history.

A PATH CREATION PERSPECTIVE ON REGIONAL FIELD FORMATION

Generally speaking, the process of regional field formation can subdivided in three general phases (see Fig. 2). In the first phase an *emerging* field becomes visible in the region by forming around a new key issue. At this stage, three distinct periods of path creating processes such as mindful deviation of old paths, mobilizing others and organizing regional institutional entrepreneurship are to be distinguished. In the second phase place-specific institutions are *developing* in the regional field and a certain self-reinforcing institutional pattern comes to the fore. Finally, in the third phase a *mature* regional field is increasingly bounded to institutional arrangements which are reflexively maintained by the regional field members. In the next section, the first phase of this model - the emergence of regional fields - is illustrated in the empirical part of this paper.

Fig. 2: A path creation perspective on regional field formation



Source: own illustration

ILLUSTRATIVE CASE: THE EMERGING FIELD OF ELECTROMOBILITY IN THE BERLIN REGION

In the recent past, industrial and political actors (re)discovered battery electric vehicles as a promising future technology for urban mobility which is reflected in globally increasing R&D efforts[1]. As a consequence, the German Federal Government released the National Electromobility Development Plan (2009). Besides its focus on intensified research and development of battery systems, this roadmap pays considerable attention to the regional scale as the necessity of an alternative charging infrastructure is to be tested and the viability of battery electric vehicles is to be demonstrated in regional projects.

In the following, a case description of the emerging field that is forming around the issue of electromobility in the Berlin region is provided. The basic aim is to illustrate the conceptual arguments regarding the early stage of regional field formation with preliminary empirical evidence. The case study is guided by the following questions: How is the new issue of electromobility anchored in the Berlin region? And which constellations of actors get involved in regional institution building processes in this emerging regional field? A case study design has been chosen as the main focus is on a contemporary phenomenon within a dynamic context that is still in the making (Yin 2009). Thus, the case of the Berlin region is embedded in the broader national context of electromobility in Germany. The case description covers a three year time period starting in late 2007 when the first contours of the field became visible and draws on collected documents such as press releases, reports and presentations derived from industry and governmental sources. Applying a temporal bracketing strategy (Langley 1999), three distinct periods are decomposed to structure the description of processes and events for analytic purposes.

[1] In a narrow sense, electromobility only includes battery electric vehicles (BEV) and plug-in hybrids (PHEV)

Context: The issue of electromobility in Germany

In 2009, the German Federal Government released the National Electromobility Development Plan, which objective is to bring one million battery electric vehicles and plug-in hybrids onto the roads by 2020. The starting point of political actions in the field of electromobility can at least be traced to the meeting of the German Federal Cabinet in Meseberg in August 2007. The main purpose was to implement the European energy and climate policy into federal actions. In total, the developed federal energy and climate policy (Integriertes Energie- und Klimaprogramm) contains 29 different measures addressing general aims such decreasing greenhouse gas emissions, raising the share of renewable energies and increasing energy efficiency. As one of these measures the need for battery electric mobility in Germany was announced. This was the first official reference to electromobility by the German government which addressed at least the automotive, electric utility and electronics industries. Even though this seems to be the starting point of a convergence process between former unrelated sectors, the national strategy conference on electromobility can be perceived as the field-configuring event (Lampel & Meyer 2008). In November 2008, governmental authorities, scientists and representatives from all related industries met to discuss Germany's future development in the field of electromobility and elaborated suitable measures for further promotion. Taking also into account other country's strategies (e.g. USA, Japan, China) the German government decided to promote all value chain activities from the stage of fundamental research to market entry. Thereafter, five objectives were incorporated into the National Electromobility Development Plan: (1) Electromobility will contribute to achieve the energy and climate policy goals; (2) Germany will become a lead market for electromobility; (3) Germany's innovation capacity is to be fostered to maintain competitiveness; (4) New forms of mobility are to be developed; and (5) Public visibility and acceptance is to be obtained.

The “pathway to the lead electromobility market“ (German Federal Government 2009: 42) is subdivided in three distinct phases, namely the market preparation phase (2009-2011); the market escalation phase (2011-2016) and mass market phase (2017-2020). Especially, it addresses six topics: Research and development, batteries, vehicle technology, infrastructure, enabling framework and market development. These issues are further discussed between industry representatives, the scientific community and governmental authorities in seven working groups which were implemented in May 2010 after the National Platform of Electromobility was founded.

In March 2009, the German government passed the Second Economic Stimulus Package which includes an overall budget of €500 million to promote research and development, market preparation and introduction of battery electric vehicles in Germany. More than one fifth of the budget (€115 million) is dedicated to the Electromobility Model Regions Program to develop battery electric mobility with a regional focus. In June 2009, eight model regions were selected from almost 130 submissions by the German Federal Ministry of Transport, Building and Urban Development, namely the urban regions of Berlin/Potsdam, Hamburg, Munich, Bremen/Oldenburg, Rhine-Main, Rhine-Ruhr, Stuttgart and Saxony. The target of this program is twofold. First, it focuses on enhancing the visibility of electromobility as ongoing demonstration projects are embedded in the selected model regions. Second, the program addresses the installation of the charging infrastructure which is an essential but unresolved prerequisite for the diffusion of electric cars.

The program is organized as follows. At the national level, the program is coordinated by a state owned innovation agency on behalf of the German Federal Ministry of Transport, Building and Urban Development. It is responsible for the monitoring, coordination and implementation of the entire program. In all eight selected regions a local project coordinator

is implemented at the interface between regional projects and the national program coordination. These coordinating organizations are either regional innovation agencies, research institutions or local municipal utilities. At the project level, the program focuses on a diverse set of interorganizational projects which are clustered in five modules (private transport, public transport, commercial applications, infrastructure and project development).

At the regional level, interaction occurs within and between these interorganizational projects. The importance of regional coordination for bridging several sectoral boundaries is highlighted by the national program coordination: "…attention is turning to a regional approach, in order to facilitate the development of electromobility from regional clusters. Through cooperation of industry, the energy sector, science and individual regional authorities, competences and activities can be grouped together and the different building blocks of electromobility can be created in a targeted way" (NOW GmbH 2010: 86). To give an example, the installation of an alternative private and public charging infrastructure for battery electric vehicles is an important issue in all model regions. Altogether, it is planed to install more than 2000 charging points in the eight model regions by 2011 (see Tab. 1 for details).

Tab. 1: Planned charging infrastructure in eight model regions

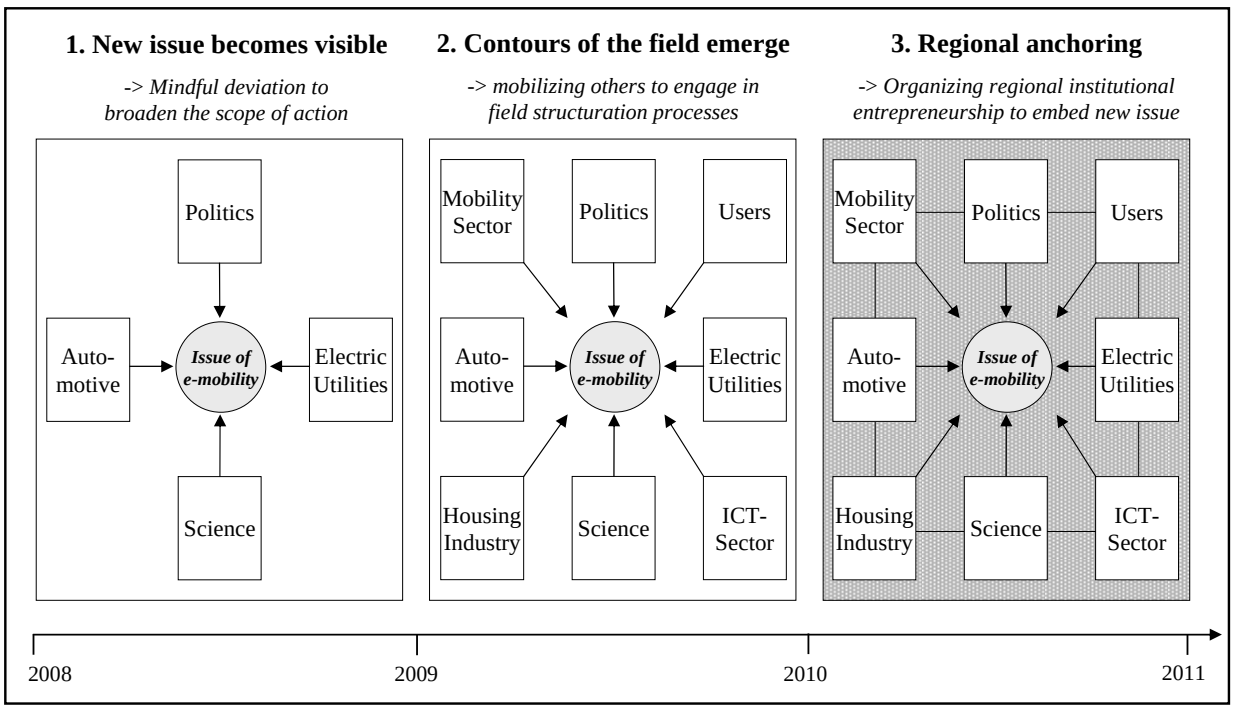
Model region	Berlin/ Potsdam	Stuttgart	Rhine-Ruhr	Munich	Hamburg	Rhine-Main	Bremen/ Oldenb.	Saxony	**Total**
Charging points (planned)	600	500	500	250	250	140	80	65	**2385**

Source: BMVBS 2010

Case study description: The emerging field of electromobility in the Berlin region

Since the issue of electromobility was introduced at the national level by political authorities and involved industries, actors in the Berlin region simultaneously started to shape the contours of the emerging regional field. Up to date, the total volume of all electromobility projects in the Berlin region amounts to €80 million, more than in any other German region. The case description serves to illustrate the processes evident in the preformation phase of regional field genesis. This phase has been decomposed in three distinct periods to structure the description of processes and events, assuming continuity within each period and certain discontinuities at its frontiers (Langley 1999). The first period focuses on how the new issue of electromobility became visible in the Berlin region, the second period demonstrates how the contours of the regional field emerged and finally, the third period illustrates how electromobility is anchored and permanently embedded at the regional level (see Fig. 3).

Fig. 3: Genesis of emerging field in the Berlin region 2008-2011



Source: own illustration

Period 1: New key issue becomes visible in the region

While Berlin was already a hub of electric mobility at the end of the nineteenth century, the issue was taken up once again in 2008. At that time, three exclusive project consortia between German automotive manufacturers and electric utilities announced field tests in the Berlin region to experiment with battery electric vehicles. The partnerships of RWE/Daimler, Vattenfall/BMW and EON/Volkswagen were subsidized by several federal ministries. One reason that these projects were set up in the capital region was to gain public and political awareness. Both industries aimed to demonstrate their general commitment to this technological alternative. Additionally, the urban region of Berlin serves as a well suited experimental ground as electromobility will first and foremost emerge in urban regions due to the limited range of battery electric vehicles. At this early stage though, these projects lack of regional embeddedness. The Berlin region was rather used as a "technology sandbox" by automotive companies and electric utilities in the first place. Nonetheless, these actors showed their willingness to broaden their scope of action signalling to take battery electric mobility into consideration, thus mindfully deviating from their dominant course of action. Even before the first cars were used in demonstration projects, electric utilities started to install charging points in public spaces which rapidly revealed different interests of electric utilities and the municipality concerning the future expansion of an alternative charging infrastructure - simply because of a lack of regulative institutions. In sum, the issue of electromobility became visible and was put at the regional agenda at the end of the first period.

Period 2: Contours of the field emerge in the region

In June 2009, the Berlin/Potsdam region was selected as a model region for electromobility by the Federal Ministry of Transport, Building and Urban Development. Both

the Berlin transport technology systems network (TSB-FAV) and the Berlin senate for urban development (Senatsverwaltung für Stadtentwicklung) act as local project coordinators. Five interorganizational projects have been set up in the Berlin region so far. The diverse set of projects focus on different aspects of electromobility such as private and public transport, commercial applications and the infrastructure installation. Compared to the demonstration projects initiated by the automotive industry and electric utilities, these projects are characterized by the involvement of further industry sectors that are considered to play an important role for the implementation and diffusion of battery electric mobility. For instance, the German railroad company Deutsche Bahn leads a project called “be-mobility” which includes partners from the energy sector, automotive industry, public transport and academia. This project deals with the integration of battery electric vehicles into public transport systems. In addition, housing companies are involved in regional projects to integrate electromobility in residential neighborhoods and logistics companies aim to demonstrate the viability of inner-city deliveries with battery electric vehicles. Even though these projects mainly aim to demonstrate the viability and to enhance the visibility of electromobility from the outset, it can be stated that the contours of the regional field started to emerge even though the field membership is still fluid. For instance, certain constellations of actors became visible who started to shape early regulations and practices. In sum, several different actors from formerly disparate sectors were mobilized in the Berlin region to engage in field structuration processes at the end of the second period.

Period 3: Organizing regional anchoring

As the Model region program will expire in summer 2011, regional actors such as regional innovation agencies, municipal authorities and regional industry associations increasingly called for a long-term implementation of electromobility in the Berlin region to

stabilize regulations and practices aimed at regional value creation within the emerging field. In the recent past, the issue electromobility became a fundamental part of the already existing competence cluster transport and mobility within the Berlin-Brandenburg region. The Industrial Master Plan 2010-2020 aims to provide new jobs in the industrial sector in general and in the green economy in particular. Currently, 140 companies from the automotive sector employ 20.000 employees and 600 researchers work for public research facilities in the Berlin region[2]. In the field of electromobility, Daimler announced to start the production of electric engines in Marienfelde by 2012 and first-tier supplier Continental set up a R&D unit focussing on Li-Ion batteries with 350 engineers in Berlin. Several regional initiatives emerged to shape the preconditions for regional value creation in the future. At present, a diverse set of activities can be witnessed in the field of electromobility in the Berlin region. Thus, it is increasingly complained that field tests, R&D projects, the installation of infrastructure and the like are not coordinated in a targeted way. As a result, a collective of regional actors such as regional industry associations, regional innovation agencies, unions and municipal authorities push for creating new regional institutions such as a formal coordination agency, a harmonization of local regulations and a stabilization of interorganizational and intersectoral practices to permanently embed the issue of electromobility in the Berlin region. As a first cornerstone, a regional agency for electromobility was set up in November 2010. The main purposes are to coordinate pilot projects of electromobility and involved actor constellations and their divergent interests, to strengthen research and training capacities and to attract new production facilities for component manufacturing such as batteries in the Berlin region. In the near term, the Berlin region makes a bid to become a “national showroom” for further demonstration and R&D projects. In sum, an increased effort to organize the regional anchoring and permanent regional embeddness of the issue can be observed in the ongoing third period.

[2] Altogether, the competence cluster transport and mobility in a broad sense includes 103.500 employees

DISCUSSION

This paper examined the formation of a region's institutional endowment at a stage where an institutionalized space, e.g. an industry cluster, has not yet fully emerged. Informed by neoinstitutional theory, the regional field was introduced as a promising level of analysis to study both the emergence of place-specific institutions and the role of collective entrepreneurship that underlie the creation, destruction and maintenance of a region's institutional arrangement. Drawing on path related arguments, this paper provided a basic model of regional field formation that differentiated emerging, developing and mature stages of regional fields. The attempt to apply the field concept at the regional level was motivated by the recent claim in neoinstitutional theory, that "institutional theorists' neglect of community-level influences is particularly ironic, given the theory's underlying premise that action and choice cannot be understood outside of the cultural and historical frameworks in which organizations are located" (Marquis, Glynn, Davis 2007: 941).

Empirically, the first phase of regional field formation was illustrated by a case description of the emerging field that is forming around the issue of electromobility in the Berlin region. For analytical purposes, this phase has been further decomposed in three distinct periods. The first period focused on how the new issue of electromobility became visible in the Berlin region, the second period demonstrated how the contours of the regional field emerged and finally, the third period illustrated how regional actors attempted to permanently embed the issue of electromobility at the regional level aiming at regional value creation in the future. Particularly, it has been argued that organizing regional anchoring can be considered as an important prerequisite to generate momentum for new institutional paths within this emerging field.

This paper has two modest implications. First, acknowledging the recent scholarly interest in the genesis and origins of institutionalized spaces such as industry clusters, it was pointed out that the suggested term “emerging clusters” (Menzel, Henn, Fornahl 2010) may be misleading. Due to its non-ergodic nature, path dependent processes in nascent clusters evolve as a consequence of its own history. Thus, it is not known ex ante if a cluster will emerge in the first place and in which direction the institutional path of a cluster will develop. According to this, the notion of regional fields may be a more applicable level of analysis to shed light on processes in the early stage regional institutional emergence. As a regional field can be seen as a medium and outcome of field structuration processes, both its genesis and its effects on regional economic evolution can be taken into account.

Second, this paper contributes to the ongoing discussion on the role of collective agency in the preformation phase that aims to trigger path dependent dynamics. Although path dependence is commonly seen as a fundamental feature of the economic landscape, processes of regional path creation have been rarely discussed in the regional science literature (Martin & Sunley 2006). Thus, the role of agentic processes that underlie regional institution building is by and large neglected. Predominantly, initial location choices of new industries have been explained as a purely random phenomenon which subsequently may trigger geographical clustering processes driven by path dependent dynamics. In contrast, this paper takes on the call for a more agency orientated approach (Sydow, Lerch, Staber 2010) that is more sensitive to processes in the preformation phase where the initial seed of regional fields is planted and continuously fostered by collective path creating efforts such as organizing regional anchoring as evident in the case of electromobility in the Berlin region. In other words, one can conclude: “Louis Pasteur said that fortune favors the prepared mind and cluster formation appears to favor the prepared region. Path dependence and resource accumulation are part, but only part of the story” (Feldman & Braunerhjelm 2006: 11).

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