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**Article:**
Pinkse, Jonatan, Vernay, Anne-Lorene and D'Ippolito, Beatrice orcid.org/0000-0003-0778-4373 (2018) An organisational perspective on the cluster paradox : exploring how members of a cluster manage the tension between continuity and renewal. Research policy. 674–685. ISSN 0048-7333

https://doi.org/10.1016/j.respol.2018.02.002

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# An organisational perspective on the cluster paradox: Exploring how members of a cluster manage the tension between continuity and renewal

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**Abstract**

Clusters face what has been referred to as a 'cluster paradox'; a situation in which a collective identity breeds cohesion and efficiency in inter-organisational collaboration, yet it hinders the variety needed to adapt to disruptive change and prevent lock-in situations. Accordingly, a recurring theme in the literature on cluster evolution and cluster life-cycles is the need for constant renewal to allow clusters to adapt to a changing environment. However, how individual firms enact a process of cluster renewal and consider possible response options is not well understood. Using a French energy cluster as empirical setting, this paper investigates individual members' enactment of the renewal in terms of how it could affect their current position, both structurally and relationally, and to what extent members felt that they had agency to steer the process to safeguard their position. The findings show that members' enactment of the proposed change does not only depend on the perceived impact of cluster renewal on the member itself but also on the impact the renewal might have on other members in the firm's network. The analysis also suggests that cluster renewal leads to a leadership vacuum where it is not clear who, if anyone, will lead the renewal process.

**Keywords**: cluster; cluster identity; cluster renewal; cluster leadership; enactment

## 1. Introduction

A common assumption in the cluster literature is that a shared vision is what binds members of a cluster together (Morosini, 2004; Pitelis, 2012). If cluster members have a common understanding of the main objectives of the cluster, it creates a collective identity in terms of what the cluster stands for and how outsiders see it (Beebe et al., 2013; Staber, 2010; Staber and Sautter, 2011). A shared vision is considered an important boundary condition for clusters to function (Pitelis, 2012) because it stimulates the inter-organisational relations between members; these, in turn, facilitate the materialisation of economic benefits deriving from geographical proximity, such as spatially bounded knowledge spillovers (Maskell, 2001; Morosini, 2004; Suire and Vicente, 2014). However, the downside of a strong collective identity is that it might create too much uniformity in a cluster (Staber and Sautter, 2011). If all cluster members think alike, they might turn a blind eye to disruptive change in the external environment that requires the cluster to adapt and move in new directions (Grabher, 1993; Martin and Sunley, 2011). Consequently, a cluster could suffer from a lock-in and move into decline (Martin and Sunley, 2006; Østergaard and Park, 2015).

Clusters face what has been referred to as a 'cluster paradox', that is, a situation in which a collective identity and homogeneity breed cohesion between members and efficiency in inter-organisational collaboration, yet hinder the variety needed to adapt to disruptive change and prevent lock-in situations (Menzel and Fornahl, 2009; Tichy, 2001). Accordingly, a recurring theme in the literature on cluster evolution and cluster life cycles is the need for constant renewal, allowing clusters to adapt to a changing environment (Baglieri et al., 2012; Martin and Sunley, 2011; Menzel and Fornahl, 2009; Nooteboom, 2006; Suire and Vicente, 2014). While this literature shed light onto how clusters as a whole deal with the cluster paradox, it partly overlooks how individual firms deal with the tension between continuity and renewal. Cluster renewal might be beneficial for the longevity and resilience of the

cluster (Suire and Vicente, 2014), but it may lead to tensions between individual cluster members. Existing members might, for example, resent a change in cluster dynamics from bringing in new members, as this could marginalise their role. Individual members might not consider what is beneficial for sustaining the cluster as being favourable for them. Cluster renewal aimed at preventing lock-ins might thus lead to inter-organisational conflict because it shakes up various balances within the cluster, such as between large incumbents (so-called anchor tenants) and small firms (Aharonson et al., 2007; Baglieri et al., 2012; Hervas-Oliver and Albors-Garrigos, 2014); between cooperation and competition (Newlands, 2003); or between the creation of fundamental research and applied knowledge (Suire and Vicente, 2014).

This paper investigates how individual members of a cluster deal with the tensions arising from the countervailing pressures for continuity and renewal that may emerge in a cluster. Conceptually, we use an enactment lens which emphasises that organisations construct their own meaning of changes in their environment based on preconceptions and, in so doing, try to align such changes with their preconceptions (Weick, 1988; Weick et al., 2005). Accordingly, we examine how members' preconceptions of cluster identity and internal relations affect their perception of a proposed renewal and how this enactment process informs their consideration of potential responses to the renewal. Since cluster renewal might be advantageous for some but not for their collaborating partners, our analysis focuses on the way in which members enact cluster renewal while knowing that it affects their own structural and relational position in the cluster as well as that of others. In this context, structural position refers to members being at the core or at the periphery of the cluster (Suire and Vicente, 2014), while relational position denotes the nature of the relationship between members, that is, whether they have cooperative and trusting relationships or relatively more competitive and contentious relationships (Newlands, 2003).

To analyse how cluster members deal with the countervailing pressures for continuity and renewal, we conducted an in-depth case study of an energy cluster. Several public and private organisations set up the cluster as part of a government initiative, but a recent change in government policy put pressure on the cluster to renew itself. More specifically, the government tried to push the cluster to change its focus along the knowledge value chain (Suire and Vicente, 2014). While the focus used to be on collaborative R&D projects with the aim of producing fundamental knowledge, the government wants the cluster to shift towards encouraging commercialisation and producing applied knowledge instead. The proposed change has increased tensions between members because it questions the cluster's identity, initially built around cooperative projects for fundamental knowledge creation. With our analysis, we show how cluster members' enactment of cluster renewal not only depends on the perceived impact on their own structural and relational position in the cluster, but also on that of other members. Moreover, we show that cluster renewal can lead to a leadership vacuum when the current anchor tenants are not the ones initiating the renewal process. With these findings, we contribute to the debates on cluster evolution and life-cycles as well as cluster leadership.

## 2. The cluster paradox and sources of inter-organisational conflict

### *2.1 The paradoxical nature of clusters*

From a cluster life-cycle perspective, a cluster both needs to create continuity so that members can successfully cooperate based on mutual trust and to seek renewal in order to adapt to the external environment and avoid a lock-in (Menzel and Fornahl, 2009; Staber and Sautter, 2011; Tichy, 2001). The need for continuity and change means that a cluster should be both homogeneous and heterogeneous to maintain success and build resilience over time, even if being both is not possible all at once (Menzel and Fornahl, 2009; Suire and Vicente,

2014). This 'cluster paradox' draws attention to the ambiguous relationship between stability and change which concerns the chance of an organisational entity to prosper and survive (Farjoun, 2010). A high degree of homogeneity creates stability, which helps a cluster to function well through strategic cohesion, connectedness, social interaction, cooperation, and a common knowledge pool (Menzel and Fornahl, 2009; Staber and Sautter, 2011; Suire and Vicente, 2014). The risk, however, is that the homogeneity, which is generating benefits in the short run, becomes detrimental for the cluster in the long run as it leads to inertia. Too much stability and cohesion could lead a cluster to become locked into a technological trajectory (Martin and Sunley, 2006). Therefore, a need for heterogeneity has been advocated, because it facilitates change. While heterogeneity might lead to more conflict and disagreement between members, it also breeds creativity, needed to renew a cluster and stay abreast with changes in the environment (Baglieri et al., 2012; Suire and Vicente, 2014).

While the need for cluster renewal is generally acknowledged (Baglieri et al., 2012; Suire and Vicente, 2014), clusters suffer from inertia for two closely related reasons. First, renewal tends to imply a change in a cluster's purpose or direction - i.e., a change in identity (Beebe et al., 2013; Staber, 2010; Staber and Sautter, 2011) - and, second, it involves breaking up old and forming new collaborations - i.e., a change in the relations between members (Martin and Sunley, 2003; Menzel and Fornahl, 2009). While changing a cluster's identity and nature of relations may be possible over time, it tends to be a lengthy process and might therefore form a constraint for cluster renewal in the short run. Due to these sources of inertia, the cluster paradox manifests itself in two different underlying but related paradoxes: a *paradox of identity* (Staber and Sautter, 2011) and a *paradox of embeddedness* (Uzzi, 1997).

Cluster identity is "the shared understanding of the basic industrial, technological, social and institutional features of a cluster" (Staber and Sautter, 2011, p. 1350). A strong

identity is paradoxical because it both adds to a cluster's success and forms a source of inertia. A strong identity allows members to benefit from their geographical proximity through mutual learning (Maskell, 2001; Staber, 2010) and exploiting technological synergies (Menzel and Fornahl, 2009). If members do not have a shared understanding of the cluster, there might be too much cognitive distance between them. As a result, they will not be able to profit from one another's knowledge creation and technological expertise, because they lack the absorptive capacity to translate outside knowledge into meaningful internal knowledge (Nooteboom et al., 2007). A strong identity also improves a cluster's reputation and is status-enhancing (Beebe et al., 2013; Staber and Sautter, 2011). However, it might lead to inertia, because it is based on a taken-for-granted understanding about a cluster's main purpose. As Staber and Sautter (2011: 1350) argued, "cluster identity may require a certain degree of fluidity, especially under environmental conditions that threaten the well-being of clusters." Hence, while a cluster's identity may change over time, it is complex to adjust it swiftly in response to environmental change (Staber and Sautter, 2011).

In a cluster, embeddedness refers to the social relations that facilitate the economic activities that members develop from being part of a cluster (Granovetter, 1985). As Granovetter (1985: 490) stated, embeddedness emphasises 'the role of concrete personal relations and structures (or "networks") of such relations in generating trust and discouraging malfeasance.' However, a cluster tends to suffer from a 'paradox of embeddedness', that is, '[t]he same processes by which embeddedness creates a requisite fit with the current environment can paradoxically reduce an organisation's ability to adapt' (Uzzi, 1997: 57). Strong relations can lead to a limited variety of views in a cluster which hinders the collective to adapt to disruptions (Grabher, 1993). Clusters with deeply embedded members run the risk of being locked-in into specific technologies and the same network of collaborating partners (Martin and Sunley, 2003; Menzel and Fornahl, 2009). Strong relations between members

might be at odds with external developments, when these require finding new partners instead (Eisingerich et al., 2010). As Grabher (1993) explained, an important reason that Germany's Ruhr cluster declined in the 1970s was a strong interdependence between coal, iron, and steel firms. While firms were able to adapt to others in the cluster, they failed to adapt to changes in the environment. In a cluster, embeddedness is particularly risky when members depend on a core organisation that might lose its core position, or when the social aspects of the relations become more important than the economic rationale of being part of the cluster (Uzzi, 1997).

The paradoxes of identity and embeddedness are two sides of the same coin and reinforce each other. When cluster members share a basic understanding of what the cluster's main purpose is, they also tend to have strong relations with each other. In response to the inertial forces of a cluster's identity and embeddedness, scholars who see clusters as being driven by collective agency and governance have argued that clusters should deliberately push for renewal (Martin and Sunley, 2011; Suire and Vicente, 2014). This tradition in the cluster literature argues that clusters have some form of leadership through which they are centrally governed (Provan and Kenis, 2008; Schüßler et al., 2013; Sydow et al., 2011), either by the government, the cluster management, or anchor tenants (Baglieri et al., 2012; Hervas-Oliver and Albors-Garrigos, 2014). While renewal might lead to a loss in cohesiveness and disagreement between members, initiative from a cluster's leadership to create more heterogeneity in terms of objectives and members allows it to change direction and anticipate environmental change and thus be beneficial for the cluster's longevity (Menzel and Fornahl, 2009; Suire and Vicente, 2014). Having the leadership questioning the identity encourages members to re-think the cluster's core values and objectives. Moreover, a contested vision could lead the cluster to explore new technological trajectories or partnership opportunities.

*2.2 Cluster members' enactment of the tension between continuity and renewal*

Scholars have discussed the cluster paradox mainly in aggregate terms (Menzel and Fornahl, 2009; Staber and Sautter, 2011; Tichy, 2001) and a recurring theme is that clusters need to constantly renew themselves to steer clear from ending up in a lock-in (Martin and Sunley, 2006). However, renewal might upset a cluster's internal balance and create tensions between members. A relevant question, therefore, is what consequences renewal has for the position of individual members within a cluster. Using an enactment lens to shift the discussion to the organisational level, the question becomes: how do individual cluster members enact a change in a cluster's purpose and direction and deal with possible ensuing tensions due to the renewal process? Enactment emphasises that members will make sense of the same process of cluster renewal in different ways, because their sensemaking is based on preconceptions of their current position in the cluster (Weick, 1988; Weick et al., 2005). Moreover, their consideration of potential responses will be influenced by how they make sense of the renewal process. We expect members' sensemaking to be related to preconceptions regarding the cluster identity and their embeddedness in the cluster. Members with strong affinity to the current identity and close relations with existing members are more likely to perceive cluster renewal as a threat, while those with less affinity are more likely to perceive it as an opportunity instead. To capture these preconceptions, we propose to examine whether individual members expect cluster renewal to either disrupt or enhance their structural (Menzel and Fornahl, 2009; Suire and Vicente, 2014) and relational position in the cluster (Newlands, 2003; Pitelis, 2012).

A member's structural position refers to whether it finds itself at the core or at the periphery of the cluster (Suire and Vicente, 2014). A member finds itself in a core position when it has a good fit with the cluster identity, the same understanding of the cluster's main purpose with other core members, and a strategic focus that corresponds to the cluster's

remit. The structural position also depends on the way the cluster's network is organised, though. A Marshallian industrial district, for example, has a decentralised structure and consists of many small firms, which means that there is no clear core or periphery (Markusen, 1996). Here, we focus on clusters with a fairly centralised structure of a few large members at the core and many smaller ones at the periphery, such as hub-and-spoke and state-anchored industrial districts (Markusen, 1996). In centralised clusters, a few incumbents play a key role and are referred to as anchor tenants (Baglieri et al., 2012) or technology gatekeepers (Hervas-Oliver and Albors-Garrigos, 2014; Morrison, 2008). Due to their unique knowledge, vast resources, and diverse relationships with actors in their network, anchor tenants tend to be better equipped than their counterparts at the periphery in influencing the cluster's technological trajectory. Firms are motivated to co-locate with anchor tenants for the potential knowledge spill-overs that accrue from being geographically proximate and embedded in their network (Baglieri et al., 2012).

When members are in a core position (e.g., anchor tenants), they tend to enjoy stronger reputational benefits from being part of the cluster. However, they also stand to lose more and are, as a result, more likely to fall victim to the inertial forces of the current cluster identity and resist cluster renewal (Staber and Sautter, 2011). Anchor tenants, for example, "have their own individual objectives which are not always to the best advantage of their networks, nor to that of the cluster as a whole" (Hervas-Oliver and Albors-Garrigos, 2014, p. 433). Their main interest tends to be the creation of continuity to safeguard their central position, instead of pushing for change. While renewal would prevent a lock-in and an eventual downfall of the cluster (Hervas-Oliver and Albors-Garrigos, 2014; Martin and Sunley, 2003; Menzel and Fornahl, 2009; Suire and Vicente, 2014), members at the core may fear being pushed to the periphery. This fear of losing a central position not only concerns

anchor tenants, but also smaller members that strongly associate themselves with the cluster identity.

The relational position of a member refers to the nature of its relations with others in the cluster and the extent to which it might fall victim to the inertial forces of embeddedness. A member finds itself in an embedded position when its relations with others tend to be of a cooperative and trusting nature (Granovetter, 1985). A less embedded member will instead experience a more competitive and contentious attitude towards others in the cluster. It has been argued that both cooperative and competitive relations are needed between members for a cluster to flourish (Newlands, 2003; Pitelis, 2012). The need for cooperation is fairly obvious as only through close interaction can cluster members benefit from agglomeration economies (Menzel and Fornahl, 2009). However, there is also a need for competition as it creates the market discipline allowing each member to operate more efficiently (Newlands, 2003). Nonetheless, competition in a cluster can also have negative consequences, for instance when cluster members compete for scarce resources and fear losing valuable knowledge or skilled people to other members (Broekel et al., 2015).

When members are in highly embedded position, they tend to have strong relations with other cluster members and are more likely to have found the right balance between cooperation and competition. Cluster renewal may disturb this complex balance of a simultaneous need for cooperation and competition between members (Newlands, 2003). For example, maintaining a balance between the two depends which activities of the knowledge value chain the cluster is focusing on (Suire and Vicente, 2014). While pooling resources might be beneficial for joint value creation, the more cluster activities affect the strategic position of individual members in the marketplace the less likely they will engage in such activities. As Newlands (2003, p. 528) explained, “the decision to develop closer relations with others then becomes a trade-off between the benefits of mutual collaboration and the

potential loss of competitive advantage." Therefore, provided that the main purpose of a cluster is to produce fundamental knowledge, i.e., without clear implications for commercialisation, members will find it easier to cooperate. Once the cluster activities change in focus towards the production of applied knowledge with clear implications for commercialisation, cluster members could see this as a competitive threat. Mutual collaboration in the context of the cluster may be seen as coming at the cost of each individual member's distinctive resource profile (Broekel et al., 2015; John and Pouder, 2006), which lies at the heart of a firm's competitive advantage (Barney, 1991). To defend their competitive advantage, cluster members might have an interest in resisting renewal that would focus on the creation of applied knowledge, as they would risk getting too close in resource profile to other members (John and Pouder, 2006). More generally, highly embedded members are more likely to resist cluster renewal because it could threaten their relations with other members, while less embedded members do not risk losing much and might even gain from the entrance of new members.

As the discussion of members' structural and relational position suggests, even though cluster renewal might help clusters steer clear from getting stuck in a lock-in, members will enact such a change based on preconceptions they hold regarding their fit with the existing cluster identity and their degree of embeddedness. These preconceptions, in turn, depend on members' perception of their current structural and relational position in the cluster and how these might change. Depending on how they exactly perceive cluster renewal, individual members will consider different response options and either support or resist such a renewal. In the empirical part of this paper, we will investigate how individual members perceive their current and possible new position in the cluster and how this perception informs their consideration of different options to respond to government pressure for cluster renewal.

## 3. Methods

### *3.1 Research setting*

Our empirical analysis draws on the case of Tenerrdis, one of the competitiveness clusters (called "Pôle de Compétitivité"), the French government established as part of its nation-wide cluster policy. This cluster policy was primarily designed to foster interaction between research organisations, e.g. research centres and universities, and profit-oriented organisations, e.g. large corporations and small and medium-sized enterprises (SMEs). The broader policy remit was to enhance local competitiveness, economic growth, and job creation (La Documentation Française, 2008). Established in 2005, Tenerrdis was a joint effort of the Rhône-Alpes region, the County of Savoie, a Grenoble-based engineering school, and a national research lab. Some of the most active firms in the region welcomed the initiative and joined the cluster as founding members. The cluster's focus and governance structure show strong overlap with the founding members' values and long-term objectives. The six themes falling under the cluster's remit – biomass, hydrogen, solar PV (research lab), smart grids, energy efficiency in buildings (research lab and engineering school), and hydropower (engineering school) – align well with the research activities of the national research lab and the engineering school.

Tenerrdis has grown significantly over the years, although we could observe a considerable turnover in its composition. Membership is rather heterogeneous in composition with a wide spread of large, medium, small and start-up firms. It also focuses on myriad (renewable) energy technologies currently at different stages of development. Over the past years, several founding members have rivalled for the position as anchor tenant and aimed to steer the cluster's direction. This rivalry is also reflected in the cluster's governance: a representative from one of the local industrial actors has chaired the cluster and general

managers have either been selected from within the research lab (until December 2013) or from a major local industrial actor. The cluster represents what Markusen (1996) labelled a state-anchored cluster, that is, a government-owned or supported entity surrounded by related suppliers and service firms. In this type of cluster, the anchor tenant tends to be central to many of the inter-firm ties, but there will also be exchange between other co-located firms.

In 2013, the French government set out a new objective for competitiveness clusters to make sure that funded research projects give rise to marketable products or services, both in France and internationally. Using the French Ministry's terminology, clusters were required to shift their overall mission from managing a 'factory of projects' (from the French "usine à projets") to managing a 'factory of future products' (from the French "usine à produits"). The government is seeking to increase clusters' financial autonomy in the development and provision of new products or services along with the creation of new job opportunities. In the government's grand plan, clusters should provide support to SMEs tailored towards facilitating access to external funds, their internationalisation process, and a more effective anticipation of the type of competencies they are in most need of. The 'performance contracts' signed between each cluster and the local government(s) have been redesigned to include the (re)new(ed) cluster mission and objectives. In brief, the cluster is in the process of making a shift towards an approach that encourages commercialisation and produces applied knowledge. To recall Markusen's (1996) typology, the government is encouraging a shift towards a Marshallian industrial district, in which innovative SMEs become embedded in the regional social dynamics and rely on substantial inter-firm exchanges. At the time of data collection, no transition had happened yet, but the cluster management team and member firms were already reflecting on how to tackle the on-going changes. As we will see in more detail in the findings section, given the way different

members enact the cluster renewal, what is more likely to emerge is a hub-and-spoke type industrial district, dominated by one or a few externally oriented anchor firms.

*3.2 Data collection and analysis*

As mentioned, this research investigates how Tenerrdis' members deal with the tensions arising from the countervailing pressures for continuity and renewal in the cluster. Based on the recent policy developments, we had reasons to believe that such tensions could lead to a contested cluster identity. In our analysis, we first explore how cluster members perceive the government's proposed change to the cluster and then how this perception influences the response options they are considering to deal with tensions that may emerge between members due to this change. As antecedent of members' enactment of the proposed cluster renewal, we considered how they were assessing their structural and relational position and how these might change. Ultimately, the analysis sought to shed light on the influence that cluster members have on the process of cluster renewal through their individual action.

For the analysis, we relied on a multiple case study design (Miles and Huberman, 1994; Yin, 2009). We collected primary and secondary data following a loose timeline which overlapped with the data analysis (Eisenhardt, 1989). This approach allowed us to strengthen data validity and facilitated the adjustment of deductively pre-established objectives with aspects that were inductively identified later on in the research process. The project started at the outset of 2014 with the collection of archival data about the establishment of competitiveness clusters in France. We gathered documents about the French government's cluster policies and benchmark reports about the performance of existing clusters. These were complemented by data specific to Tenerrdis, including results of a survey conducted to assess members' satisfaction and the latest performance contract signed between the cluster and the

French Government. Next, we conducted 21 semi-structured interviews. A representative set of cluster members were pre-selected jointly with the cluster management team based on the following criteria: size, date of joining the cluster, business focus and member firms' engagement in activities organised by the cluster, the latter aiming to sample both firms that are very active in the cluster and firms that do not participate actively (anymore). Three members that act as anchors – two incumbent firms and the national research lab – were included in the selection.

During the interviews, we aimed to uncover how members were assessing the renewal process and intending to deal with the proposed changes. We asked them to reflect on how they perceive the cluster, its function, and its focus as well as how they contribute to the cluster, what they are looking for in the cluster and how they have benefited from their membership. In addition, we asked them to reflect on the on-going changes initiated by the government. We also conducted two semi-structured face-to-face interviews with representatives from the cluster management team; these included the general manager, the innovation and partnership coordinator, and the business development and IT project manager. Interviews were conducted between July and December 2014 and lasted 60 to 90 minutes (see Table 1 for details on the interviews). Interviews were transcribed verbatim. The transcripts were sent to all interviewees to verify consistency and confirm their participation to the research. We used the archival data to triangulate the analysis of the interview data (Yin, 2009).

------TABLE 1 ABOUT HERE------

The data analysis occurred in an iterative fashion and we went back and forth, multiple times, between the data and the emerging theoretical argument (Locke, 2001). For

the sake of clarity, we will present the analysis in a sequential manner. In a first round of coding, we identified whether members, in their discourse, seem to be in favour, neutral or against the ongoing renewal process which questions the cluster identity. As such, we also looked for perceived tensions in the cluster to identify which aspects of the cluster identity are affected by the renewal. We found that renewal creates tensions around three components of the cluster identity that are all variations of the paradox between stability and change (Farjoun, 2010): the heterogeneity of cluster members, the core mission of the cluster (whether it should support R&D or help members commercialise their products or services), and whether the cluster should support fundamental or applied research. In this round of coding, the analysis revealed that whether and how the cluster should renew itself was a controversial issue and that members have very different stands on the direction the cluster should take.

The second round of coding was aimed at better understanding who cluster members are and what their position in the cluster is. We classified members along three dimensions: their size (large, medium, small or very small), their structural position in the cluster (at the core or at the periphery), and their relational position (whether they are well embedded in local networks, or not). We determined whether and how members benefited from their membership and how they see their own contribution to the cluster. This informed us about each member's activity level in the cluster, how satisfied they are about the way it has been functioning so far, and what their current position is. We also analysed how members talked about the impact that the renewal could have on their structural and relational position. In other words, we gained a better understanding of members' preconception of their current structural and relational position in the cluster and how they believe these might change. Regarding the structural position, we analysed whether members felt they would benefit from the renewal by moving closer to the core or whether they would be penalised and pushed into

the periphery. We understand that members gain in structural position when the focus of the cluster and its mission becomes more aligned with their own business focus. Members that engage mostly in short-term, applied research projects, for example, would likely gain a more prominent position in a cluster that tried to move away from fundamental research. On the contrary, members would lose out structurally if the cluster's focus starts to differ from their own. Regarding the relational position, we analysed how members see renewal affecting their relations with other cluster members. We observed whether they expected their relational position to worsen because of more competition between cluster members or because their support of cluster renewal might jeopardise existing relations with other cluster members. We also considered whether their relations might improve, as it might be easier to find members who have similar business interests and with whom they can thus collaborate. To assess the relational position, we sometimes had to interpret a juxtaposition of the tone that cluster members used when criticising cluster renewal and their current structural and relational position.

In a third round of coding, we identified the responses that members had adopted to deal with the tensions resulting from the cluster renewal, or were considering adopting, and how a perceived change in their structural and/or relation position influenced these possible responses. To address this, we structured the codes in a way that could capture how members dealt with the identified tensions or intended to deal with them. To make sense of the repertoire of potential responses, we drew on Oliver's (1991) five responses to institutional pressure: acquiesce, compromise, avoid, defy, and manipulate. We coded for 'acquiesce' when members talked about cluster renewal as something they could not influence much and that they had to live with regardless. We coded for 'compromise' when members had mixed feelings about renewal and looked specifically for aspects of the process that interested them. We coded for 'avoid' when members actively looked for ways to distance themselves from

the cluster or other cluster members, either in space or in time. We coded for 'defy' when members actively tried to prevent renewal. Finally, we coded for 'manipulate' when members used their agency to shape the renewal process in a way that was more favourable to them. In coding these responses, we included concrete actions that they had already put in place and actions that they intended or envisaged to put in place. While doing the coding, however, we realised that some responses did not fit any of the categories. For instance, some members had very ambivalent reactions and did not seem to opt for any of the responses, whilst others perceived renewal as positive and actively tried to encourage it, beyond mere acquiescence. We coded the latter as 'encourage'. Once we had gone through all three steps in the coding, we analysed the relation between members' enactment of the proposed change of the cluster and the potential responses. In doing so, we considered to what extent a perceived change in structural and relation position forms an antecedent of this enactment process.

## 4. Findings

In the data analysis, we focused on individual members' enactment of the government's initiative to renew the cluster. We analysed members' enactment of the renewal in terms of how it could affect their current position, both structurally and relationally, and to what extent members felt that they had agency to steer the process to safeguard their position. Based on this analysis, we identified five settings, each reflecting whether cluster members perceived the renewal as having a positive, neutral, or negative impact on their structural and/or relational position. Figure 1 summarises the observed settings in terms of members' preconception of their current position in the cluster and how they perceive it might change. Table 2 summarises the response options members are considering for each of the observed settings, depending on whether they felt to have agency to steer the process, or not. The following section will first describe each setting, then explain what kind of members find

themselves in these settings, and finally characterise the kind of responses members are considering and how these settings played a role in their consideration of these responses.

------FIGURE 1 & TABLE 2 ABOUT HERE------

**Setting 1: Worsening the structural and the relational position**

The first setting denotes a perception of members that their structural and relational position could worsen as a result of the cluster renewal. Because of the cluster's changing priorities, these members fear losing their central position, a position that would be taken over by other members. As the focus of the cluster changes, they also fear that their relational position may weaken as other members start looking for partners to develop commercial applications rather than research collaborations.

Only one member out of the whole sample, the national research lab, found itself in this setting. As a founding member, they contributed to the creation of the cluster and are highly engaged in the cluster's day-to-day activities. They have had strong influence on the choice of research themes the cluster addresses and possess competences in four out of five themes covered. Moreover, as a national research lab, they are very well embedded in local networks and dominate the local research environment. Multiple (local) SMEs and start-ups acquired licenses of technologies developed in the research lab. This makes them a very important anchor tenant in a cluster created to foster research collaborations between industrial firms and research labs and universities. However, if the cluster develops as the government intends to and becomes more commercially oriented, the research lab fears it might lose its central position in favour of local industrial players.

The research lab bears significant agency to respond to the renewal process and has already employed two response options. First, they defy the proposed change. This is

illustrated in the following quote: *"They [clusters] had a meaning when they were seen as factories of projects. Now they are more factories of products. But we should not stop the logic of the factories of projects. I have a strong feeling about this and it is the position I defend when I attend the board [of the cluster]."* On multiple occasions during the interview they also praised the work of the cluster management team and highlighted that "*it worked quite well so far, and we should really continue in this direction.*" They take full ownership of the cluster, which, in their own words, "*would not be credible without them in it".* They react as if questioning the performance of the cluster is like questioning their own performance. This member uses its role as one of the anchor tenants to lobby for the cluster to continue fulfilling its initial (in their opinion, *"most essential"*) mission, that is, to connect researchers and SMEs. Nevertheless, even though they disapprove of the renewal policy, the research lab is also very well aware that the cluster management team has to find a way to meet the demands of the government if it is to continue receiving government support.

The research lab also uses various tactics to manipulate the process and make sure they do not lose their central position in the structure of the cluster. First, they try to frame the current activities of the cluster in a way that fits the new policy direction. For instance, they argue that it is precisely because the cluster brings together SMEs and a research lab that an innovative ecosystem could emerge for new products to be commercialised: "*Industrial firms got organised. There are now innovative SMEs, large groups and that makes an ecosystem capable of going to regions, metropoles, precisely to develop new products. Now we need to find a good balance again to keep the basis which is the research that makes innovation possible."*

Second, given their extensive involvement in the clusters' activities, they have privileged access to the cluster management and know the type of challenges they are facing. The research lab for instance knows that the cluster management team is understaffed, which

limits the type of initiatives they can accomplish. As a board member, they try to steer the cluster management by helping them set the 'right priorities'. Besides stimulating collaborative research, they acknowledge that the cluster is legitimate when it participates in the development of large technological demonstration projects. These demonstration projects are also often an opportunity to showcase the SMEs and start-ups that bought the licenses for technologies develop in the research lab. However, they also stressed that offering consultancy services would be irrelevant for the cluster because it does not have this competency. Overall, the research lab has a rather paternalistic attitude towards the cluster management team, praising their work and encouraging them to develop activities which they view as positive; at the same time, the lab seeks to set limits to what they can or cannot do.

**Setting 2: Improving the structural position but worsening the relational position**

The second setting that we identified involves members perceiving that their structural position could improve while their relational position might deteriorate. Members that find themselves in this setting see potential structural benefits because a commercially oriented cluster would give more standing to members that are doing applied rather than fundamental research. Hence, they would have more concrete results to show to the government. The renewal would favour members that are commercially oriented, especially if they could offer markets for products developed by other cluster members or if they could help other members in getting market access. However, members in this setting also anticipate that the renewal could worsen their relational position, for instance, by increasing competition between cluster members. As one interviewee explained, "*the difficulty that I see is that the closer we are to the market, the more problems of confidentiality and strategy become important. As long as we are in the TRL 5-6, it is possible to work together. However, it is more difficult when you start to reach the TRL 9."* They also fear that the more

the cluster becomes commercially oriented, the higher the risk that confidential information leaks out. As one interviewee explained: "*The problem with the clusters is that they need to communicate about what they do, to share. It is a bit contradictory because at the same time when you are close to the market, you don't want to disclose too much.*" Members anticipate that by actively supporting the cluster renewal, they may jeopardise the relations they have with other cluster members. They would rather avoid this from happening, especially if these relations are strategic for them or if they feel insecure about their current relational position in the cluster. In other words, it seems more important for them to stay on good terms with their existing partners than to try and benefit more from their membership by aiming for a more central role.

In this setting, reflecting the views of four firms in the sample, we can identify three types of members. First, large, well-embedded industrial firms whose size and local connections already make them important anchor tenants. As founding members, they have an important voice in steering the cluster's development. Second, there are smaller, commercially-oriented members whose business focus is well aligned with the proposed new cluster identity and who are in favour of the renewal process because the new focus would fit better with their own business interest. These members tend to be more peripheral, either because their technology is unique, or they are interested in applied research, even though they are well embedded locally. One member, for example, co-develops the various technologies they commercialise with the national research lab. This relation gives them some leverage to influence the development of the cluster. However, being well embedded is not a necessity. The final type in this setting encompasses members who are less connected to local networks and feel they need to legitimate their participation in the cluster.

Interview data revealed that members who have the agency to shape the process try to manipulate the renewal to protect their interests. This concerned two of the members in this

setting. They first delegitimise the policy of the government arguing that the government is "*trying to square the circle*" and that the clusters neither have the competences nor the appropriate means to become 'factories of products'. Referring to the ambitions of the cluster to self-finance by selling services, one interviewee argued, for instance: "*It can only work if the cluster is credible, and to be credible, one needs to have real competences because becoming a consultant cannot be decreed.*" Building on the argument that clusters cannot play a more active role in the commercialisation of members' products, they propose possible alternatives for the cluster to get closer to the 'factory of products', the government wishes to establish. They suggest that the cluster should play a more formal role in bridging large member firms and innovative SMEs: "S*ome crowdfunding platforms they say they have international scientific networks behind them. Why could we not do the same but with groups of SMEs. This is an action that we could imagine with the clusters. We could do open innovation but with cluster members only.*" At the same time, these large members are conscious that their prominent role is criticised by some of the cluster members. They argue that there are "*false rumours or urban legends […] where people have the impression that the large group is here to reap the benefits of others' business activities."* They see the cluster renewal as an impetus for the cluster management to relieve these tensions and further facilitate collaborations between SMEs and large member firms. As explained by one interviewee, "*the cluster could gain in competences on this topic […] to allow synergies between large groups and SMEs.*" In other words, these members plan to use their agency to manipulate the process to make sure that they improve their structural position while making sure that they would not lose out in terms of their relational position.

The interviews revealed that the two members who lack agency to shape things on their own but depend on others to have their voice heard have quite ambivalent reactions and it is difficult to attribute any specific response to them and to anticipate what they will do

exactly. Even though they see that they might improve their structural position when pushing for the renewal to move forward, they prefer responding in a way that does not jeopardise their relational position. One member for instance gives contradicting statements several times during the interview. They argue that they would like the cluster to "*help [them] address the right mass market*", while at the same time "*[the cluster] should not focus on giving services*" but help develop "a *vibrant ecosystem*" within which collaborative research projects could emerge. This example suggests that their relational position seems to prevent them from encouraging the renewal even when it would help them getting what they really need: assistance to commercialise their technology. Another member has a similar attitude in criticising the current R&D focus to be very long term and not "*linked to the questions that actors face today*". They would clearly favour a switch to more applied research, but they are also very careful when criticising the cluster and proposing changes aligned with the on-going renewal process. They state that "*the cluster is really in a R&D position, of course it is one of the pillars of the cluster. That's also why it was created. But maybe, sometimes, we should consider more current issues.*" This quote suggests that this member does not seem to feel legitimate to criticise the cluster from fear to put the relations at risk, they built up over the years.

**Setting 3: Improving the structural and the relational position**

In the third setting, we identified three members who perceive that they might benefit both structurally and relationally from the cluster renewal. These members expect to gain structurally because their business focus is more in line with the cluster's new direction and their competencies can thus be better valorised. For instance, one member explained that the attempts to renew the cluster highlights *"that [research labs] need us because we represent the knowledge about the field, we represent the methodology, the project management.*"

Regarding their relational position, members believe it will be easier to meet other members with whom they could collaborate. One member explained how difficult it is to collaborate with members who, contrary to them, "*live from research and not from production*", suggesting that it will be easier to find partners to collaborate with to win bids once the cluster becomes more commercially-oriented. Moreover, these members believe that they could gain relationally when the cluster renewal leads to changes in the kind of activities organised. They argue that a commercially oriented cluster should organise events aimed at developing business relations and meet potential customers rather than potential research partners only. One interviewee explains that he expects to be more directly "*in contact with customers, and to present their offer."*

In this setting, we see small members that all find themselves at the close periphery. Their business focus is well aligned with one of the themes of the cluster. While these members are interested in doing R&D, they prefer more applied research projects with marketable results that can be achieved in the short run. As one member explained: "*We do applied research. This idea is not to say we do a project in three years but that instead, after one year, we should already have a product, even if it is not perfect yet, but we should have a product that is almost marketable.*" Interestingly, these members are already very satisfied with the way they benefited from their membership so far. One member explained that they "*benefited from a service that was really appreciable.*" They have used the opportunity to be very active in the cluster and proposed events or workshops that the cluster could organise. One of them initiated a mission where the cluster brought members in contact with firms from another cluster located in Tunisia. These members have strong network relations with other influential members. "*We know a lot of people in the cluster*", which allows them to influence change processes. Because of their level of participation in the cluster or personal network, they also have good connections with the cluster management team. One member

explained that the former general manager was "*a friend of [his]*". They see such connections as giving them some leverage to influence the cluster renewal.

These members perceive the renewal process as a very positive change from which they could derive benefits. They seem to have this positive outlook because the objectives of the renewal fit their business interests and they can build on their existing relational position to further benefit from the renewal. Interviews revealed that these members either plan to encourage or to manipulate the process. First, some members see much potential for the cluster to help them reach the market more effectively and thus plan to encourage the renewal. One member stated that "*the new direction taken by the competitive cluster really corresponds well to us, we are very happy with it. It fits well the philosophy we have about applied research.*" Another one explained that he is looking forward to contributing to some of the new types of events that will be organised by the cluster and recently made preliminary appointments with the cluster management in that regard. Another member envisions leveraging its network to influence the renewal process to make sure that his firm benefits most of the on-going changes in the cluster: "*There is another effort, and that's what I'm going to do with [(the first name of) the general manager] and others, is lobby*" to obtain a feed-in-tariff for their technology.

**Setting 4: Improving the structural position and leaving the relational position unaffected**

In the fourth setting, we find members who expect their structural position to improve as the cluster renews itself but do not think that their relational position will be affected. First, these members believe they might gain structurally for the same reasons as those in setting 3, that is, the cluster's new direction would have a better fit with their own business focus. They also expect potential gains because the centre of attention could move away from Grenoble

and the established networks that contributed to the cluster's creation. The following quote illustrates how members coming from outside perceive the closed local networks: "*I live in Lyon […] I am not historically from Grenoble. I arrived here and tried to integrate, to understand, to talk to different people. But the mountain between Lyon and Grenoble is really incredible!"* One of the ambitions of the cluster renewal is to increase membership by attracting firms based in other parts of the region. Finally, these members appreciate the fact that they might benefit from the renewal if it strongly favours SMEs instead of large multinationals. Some members in this setting resent the disproportionate influence of large members in the cluster. They describe large actors as "*being everywhere"*, "*being almighty*", and "*eating everything*". Large members are also criticised for having too much of a say in deciding upon the cluster's direction, leaving the voice of smaller members unheard. As one interviewee expressed it: "*The big problem is that you have a direction that is not chosen by SMEs. It is chosen by large firms and big research institutes.*"

Smaller members recognise that the cluster renewal may present an opportunity for them to gain in importance, especially given that clusters are expected to help innovative SMEs commercialising their products. However, contrary to setting 3, these members do not expect their relational position to improve. First, they have doubts about the willingness of cluster members to work towards marketable products. As one interviewee argued, "*I think that the [cluster] is more something made by researchers, public and private, for researchers to get more money from the regions or from Europe and so on.*" From their experience, "*large cluster members are only interested in long-term, big research projects*" and less in commercialising research output. Second, they also doubt the capacity of the cluster management to mobilise firm representatives that are looking for business opportunities. As one interviewee explained, "*people from large groups that come to the cluster are people that*

*are here to do market intelligence. They are not managers looking for solutions to their operational problems.*"

In this setting, we find seven members that can be divided in two groups. First, we have small or very small members whose business focus is well aligned with one of the themes of the cluster. However, these members are not very well connected in the cluster. They either have very few contacts (e.g., for firms located outside of the Grenoble area) or only know other small firms. Some even feel that they have been marginalised by a large member: "*We are blacklisted by the [large member].*" Others consider themselves as being in direct competition with an anchor tenant and thus feel overshadowed. Overall, these members feel that they have little leverage to influence what the cluster does and are located on the periphery of the cluster. Second, we have very small members that are at the far end of the periphery. They work on topics not directly linked with the themes of the cluster or hardly do any research at all. These firms usually joined the cluster in the hope of expanding their networks and receiving services that could help them grow their business. However, they often failed to find what they were looking for. One interviewee expressed his frustration: "*I spent many days, many hours. I had fascinating discussions. Generated turnover: zero. I mean that not a single relationship established generated some turnover.*" They also do not feel that it is safe for them to present their ideas in the cluster. One interviewee stated: "*We are a small structure. Sometimes we present interesting ideas, sometimes we are completely off track. Nevertheless, when we do present interesting ideas to large firms, if the idea really is interesting, then it goes. And we have no means to keep it.*" These members do not really fit in the cluster and expected more than what it could deliver.

Members in this setting considered adopting two types of responses. Those that were generally satisfied with their membership acquiesce with the on-going cluster renewal. They agree with the on-going changes and mention various possibilities to further benefit from

their membership. One member mentioned on multiple occasions his interest in meeting project developers in order to boost his sales; another discussed the need of the cluster to encourage large firms to provide more support to smaller ones by offering their competences. These members remain, however, prudent about what they expect from the cluster. They question the relevance for the cluster to offer services that are already provided by other institutions: "*If I would like to export my product, I have the BPI France. It has a good potential to support me. The cluster, I don't know very well what it could do.*" The members who so far did not benefit much from their membership tend to consider adopting avoidance tactics instead. Because they do not see things improving, they contemplate reducing their involvement in the cluster. As one interviewee stated: "*We don't invest much in [the cluster] anymore.*" Even if the renewal could benefit them, they have little faith that changes will materialise. Talking about the movement towards a factory of products, one interviewee for instance stated: "*This is not simple ha! It is a beautiful, really beautiful idea. But as for the implementation, I think it is going to be very difficult for the cluster. It is going to be very difficult."*

**Setting 5: Leaving the structural and the relational position unaffected**

The fifth setting involves members that do not feel affected at all by the proposed changes. In these members' perception, the renewal will neither influence their structural nor their relational position. These members do not seem to have a clear idea about how a change in the cluster might affect them because their involvement in the cluster is rather limited.

This setting concerns five members, including large and (very) small firms, and firms that have and those that lack connections to the local networks. Besides, the business focus of members in this setting may or may not be in line with one of the themes of the cluster. Despite apparent differences between the members, they have two things in common. They

are all in the periphery of the cluster and they all joined the cluster for opportunistic reasons. Some joined (or were even pushed to join) to obtain the label required to access some of the government funds: "*For me it was really practical. It allowed me to get the stamp needed to present my project to the government, to the Ministry.*" Besides obtaining the label of the cluster, these members are not looking for additional services from the cluster because they can either get them internally, if they are large, or get them by mobilising their external networks, if they are small. As one member argued, "*in terms of services we don't need too much. We have a contract and R&D program with [the research lab].*" These members hardly participate in any of the activities organised by the cluster and seem to have limited knowledge about the types of activities that the cluster organises. Others joined to meet local actors, follow on-going developments, and track whether technological developments that could influence their business activities in the future are gaining momentum. As one interviewee stated, when explaining why they joined the cluster: "*The idea was to be in contact with different firms in the region in the hydrogen sector, to try to see how things are developing and to get to know each other as well.*" However, this is not of high strategic importance for them and they describe their activities as representing a very small part in the collaborative research projects of other members. They see themselves as being "*in the background.*"

Members in this setting seem satisfied with what they get from the cluster and do not expect much else. They give the impression that they do not have a stake in the on-going changes. As a result, they all passively acquiesce with the renewal and respond to questions about how they perceive the future role of the cluster by "*I don't know*" or answer that they think the cluster could offer new services to others with "*why not*", but that it is not for them.

## 5. Discussion

Clusters seem caught in a 'cluster paradox': a strong cluster identity and the presence of highly embedded members improve a cluster's reputation and stimulate collaboration but at the same time stop it from adapting to disruptive change (Menzel and Fornahl, 2009; Staber and Sautter, 2011; Tichy, 2001). Cluster renewal has long been considered as the step needed to make sure that a cluster survives in the long run rather than getting caught in a lock-in (Baglieri et al., 2012; Hervas-Oliver and Albors-Garrigos, 2014; Martin and Sunley, 2011). However, while cluster renewal might be beneficial for the cluster as a whole, it is less clear how individual members perceive such a change and whether they will support or resist renewal. In this paper, we investigated how individual cluster members enact cluster renewal instigated by a new national cluster policy. In our empirical case, the proposed renewal involves a change in cluster identity (Staber and Sautter, 2011) because the government urges the cluster to shift from being research-oriented to becoming market-oriented. This change means that the cluster should provide services to support short-term projects with marketable outcomes rather than long-term projects to do fundamental research. Moreover, it requires the cluster to bring in new types of members and disturb the existing relations between members which are currently based on collaboration in research projects. In our findings, we analysed the different ways in which members perceive the proposed change and how these different perceptions influenced the response options they considered. In what follows, we discuss how our findings contribute to the debates on cluster evolution and life-cycle and on cluster leadership.

### *5.1 Contributions to the literature on cluster renewal and life-cycles*

With our analysis, we provide further insight into the debate on cluster renewal as a response to the well-documented cluster life-cycle which documents that after a period of

success clusters move into decline (Baglieri et al., 2012; Martin and Sunley, 2011; Menzel and Fornahl, 2009; Nooteboom, 2006; Suire and Vicente, 2014). Existing research has shown that a cluster that is too homogeneous can be locked into pre-existing courses of action which eventually leads to its decline (Martin and Sunley, 2003, 2006). In line with this research, we observed that despite attempts from outside to change the cluster's direction, core and peripheral members' respective influence on the cluster's course of action has hardly changed. It is (still) the same group of core members – members that are against the cluster renewal – setting the tone of the conversation.

Our findings suggest that this inertia comes from core members enacting the renewal so as to protect their own structural (Suire and Vicente, 2014) and relational positions in the cluster (Newlands, 2003; Pitelis, 2012). They have a strong preconception about what the cluster's purpose is and use their agency to defend the status quo. More surprisingly, though, members in a more peripheral position also seem to follow this course of action. Members' hesitation to re-enact the cluster's purpose and their role in it reflects the paradox of identity (Beebe et al., 2013; Staber, 2010; Staber and Sautter, 2011). A strong identity creates inertia because cluster members tend to share a taken-for-granted understanding of a cluster's main purpose and direction which takes time to change. In our case, the majority of members shared a preconception that the cluster's identity is based on research. Seeing research as the main purpose meant that members use the cluster to obtain research funding. For better or worse – some heavily criticised the role of the anchor tenants – most members kept viewing the current anchor tenants, especially the research lab, as the gatekeepers to get grants from the government. The anchor tenants have the complementary assets (Hervás-Oliver et al., 2017), such as the intellectual, human, and social capital to help in obtaining such funding. As a result, most members felt that they should follow the anchor tenants' lead, not to

jeopardise their own research activities. As a result, in their response to the proposed renewal, most members seemed to re-enact the dominance of the anchor tenants.

Our findings thus also suggest that cluster members' enactment of the cluster renewal is indicative of them being mindful of the renewal's perceived impact, not only on their own organisation but also on other members within their network. Because they observe and adapt to one another, there is increased uniformity in the responses that members consider. The inertia in the cluster evolution thus also reflects the paradox of embeddedness (Granovetter, 1985; Menzel and Fornahl, 2009; Uzzi, 1997). Members keep working with the same partners even if more heterogeneity in their collaborations is necessary (Grabher, 1993). Observing a member's structural position, one might expect a certain response; yet, the response they actually considered tended to differ due to the relational position of that same member. Our analysis indicated that the relational position tends to have stronger weight than the structural position. In practical terms, this means that, if members could benefit structurally but at the same time lose out relationally, they will not fully support the renewal process (Setting 2). Instead, they seem to manipulate the process to minimise the relational loss or remain indecisive as to which response to pursue. In other words, members prefer to protect existing relations and the access to resources that they confer (Granovetter, 1992), rather than obtaining a more central position in the cluster. This prevalence of protecting the relational position further reinforces the commitment of members to the existing cluster identity (Staber, 2010), which locks them into certain pathways (Grabher, 1993) and makes it difficult to implement change.

### *5.2 Contributions to the literature on cluster leadership*

With our findings we also provide insight into the debate on cluster leadership in relation to cluster renewal. We show that whether a cluster will manage to break free from a

potential lock-in depends significantly on *who* leads the cluster renewal. Scholars have argued that there is a relative invisibility of leadership in clusters, which means that leadership is non-hierarchical and based upon negotiations rather than controls (Sydow et al., 2011). Yet, this relational dimension is mediated by the level of agency that each member has in the cluster. In a cluster in transition, there may be certain members taking leadership over the renewal process. Before the renewal process was initiated, the research lab acted as self-proclaimed cluster leader or network orchestrator (Dhanaraj and Parkhe, 2006). By stimulating a reorganisation of the network in the cluster, the government created an opportunity to re-define who is leading the cluster. However, it is unclear who will (be willing and able to) take over this role.

Our findings suggest that members who could gain both structurally and relationally (Setting 3) are the most likely candidates to lead the renewal process. These members have complementary assets that are relevant for the cluster's newly proposed direction (Hervás-Oliver et al., 2017). That is, their expertise is relevant to the functioning of the cluster from a conceptual perspective (e.g., they have knowledge in specific energy domains) and an operational perspective (e.g., they have skills that could benefit other commercially-oriented cluster members). Besides, the government's decision to push for commercialisation gives them legitimacy to demand that R&D support should be of a more applied nature or that organised events should have a stronger commercial focus. The leading role of these members may be further reinforced by the passive acceptance or the attitude of 'indifference' some members may have, in particular those for which the change would have no impact whatsoever on either their structural or relational position (Setting 5). Since the cluster has already met these members' expectations, or these members consider themselves as not having enough agency to influence the process, they do not or cannot engage with the renewal process (Settings 4 and 5). Nonetheless, even the members that could gain

structurally and relationally from the cluster renewal seem to be caught up in existing relations as they were all highly embedded.

Moreover, it is questionable whether members favourable to renewal will be a match against those that seem to oppose the renewal process (Settings 1 and 2). The analysis shows that it is not in the interest of the anchors tenants – those that are the best equipped to influence how the cluster develops (Baglieri et al., 2012) – to support the cluster renewal. On the one hand, they fear being pushed to the periphery of the cluster because of their focus on long-term rather than applied research (Setting 1). On the other hand, they have a negative perception of participating in a cluster where the balance between cooperation and competion would change in favour of the latter as the cluster moves down the knowledge value chain (Setting 2). While they appreciate collaborating on projects related to the development of fundamental knowledge for which is it interesting to pool resources and benefit from agglomeration economies (Menzel and Fornahl, 2009; Suire and Vicente, 2014), they resent having to focus on aspects that bring the various members' distinctive resource profiles in closer proximity (John and Pouder, 2006). These members show more interest in defying or manipulating the process for their own good rather than encouraging a process that could benefit the majority (Hervas-Oliver and Albors-Garrigos, 2014). To conclude, then, the renewal has created a kind of leadership vacuum and there is uncertainty as to who (if anyone) is taking the role of leading the change. Due to the specific structure of the cluster, a state-anchored cluster (Markusen, 1996), the initiator of change (the government in our case) seems to struggle to lead and implement the change.

## 6. Conclusions

This paper aimed at contributing to the growing body of literature on cluster renewal, life-cycles and the role of leadership in the evolutionary process. While most recent studies

focus on clusters as a whole (Baglieri et al., 2012; Martin and Sunley, 2011; Menzel and Fornahl, 2009; Nooteboom, 2006; Suire and Vicente, 2014), this paper addresses cluster renewal from the perspective of individual cluster members. More specifically, it analyses how individual members enact a process of cluster renewal and whether they will support or resist renewal. Our findings show that members' preconceptions regarding the cluster's identity and nature of relations have a considerable influence on how they might respond to a proposed change. More specifically, members' perception of the renewal's potential impact on their structural position is not sufficient to fully understand their possible responses to such change. Instead, members also seem to consider the impact that cluster renewal might have on their relational position as well as the possible response of other members in their network. It is the combined effect of members defending their structural and relational positions in a cluster that forms a significant force of inertia and slows down cluster renewal. The analysis also shows that cluster renewal can lead to a leadership vacuum where it is not clear who (if anyone) should take the lead in pushing the cluster renewal forward.

Based on these results, we can draw a number of recommendations for policy makers as they try to steer cluster renewal. First, we suggest that the cluster management team should step in to address the observed lack of leadership. To be able to do so, however, they should have enough resources and incentives to try to increase the cluster's heterogeneity and create more openness by attracting firms further away from the cluster's core (either in terms of focus or location) and whose business focus is aligned with the new cluster identity. Improving a cluster's openness has been shown to improve cluster's performance, especially under conditions of increased uncertainty (Eisingerich et al., 2010). A more open cluster allows its members to continuously modify their activities and collaborations which help in staying abreast with changes in the environment (Baglieri et al., 2012; Suire and Vicente, 2014). Over time, as members with different expectations join, an intervention of creating

more openness and heterogeneity might help counter-balance the forces of inertia at play. The cluster management team may also try to organise activities that help cluster members find new ways to collaborate with one another and make sure they can benefit from the collaboration without putting their competitive advantage at risk (Newlands, 2003). The empirical evidence points to some possibilities: one of the anchor tenants for instance already envisages using the cluster as an open innovation platform to set up privileged partnerships with innovative SMEs. This new perspective on the cluster could be an opportunity for cluster management to create a more competitive cluster environment and, in turn, motivate small firms to exploit heterogeneity (i.e., an intrinsic characteristic of the cluster) rather than being locked into a cluster dominated by a few large members.

Finally, this study has several limitations, which form the starting point for future research. First, our analysis has a European bias as it is focused on a cluster where the national and regional government play a crucial role. One can argue that the dynamics in such centrally governed clusters (Provan and Kenis, 2008; Schüßler et al., 2013; Sydow et al., 2011) will be quite different from the dynamics in participant-governed clusters, more common in the United States (Feldman et al., 2005). Future research could therefore investigate whether individual members' enactment of cluster renewal will be different when the pressure for change comes from outside, as in our case, or from within. Second, this study took place at the onset of the renewal process and we could only analyse how members reflected on the proposed renewal. We could not examine what they actually did, as, at that stage, the outcome of the renewal process was quite uncertain. Future studies on this topic would thus benefit from a longitudinal research design, which allows comparing individual members' perspectives on the cluster before and after a fundamental change in direction.

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Table 1: Details of interviews

| Firm | Size | Market Reach | Sector | Informant | Interview date | Length |
|---|---|---|---|---|---|---|
| Member 1 | Large | Global | Across thematic/Electricity producer | 1) Integration director<br>2) Expert biomass | 09/07/2014 | 71 min<br>60 min |
| Member 2 | Large | Global | Energy | Innovation and Partnership Manager | 16/10/2014 | 72 min |
| Member 3 | Large | Global/Lyon | Components | R&D Manager | 25/06/2014 | 84 min |
| Member 4 | Medium | Global/outside RA | Components | 1) Sales Engineers<br>2) Sales and Marketing Manager | 24/07/2014 | 51 min |
| Member 5 | Medium | Global/Grenoble | Technology producer/CSP | 1) Partnership Director<br>2) Project Manager | 15/07/2014 | 56 min |
| Member 6 | Medium | National/Grenoble | Software/Energy efficiency | Business Development Manager | 15/07/2014 | 74 min |
| Member 7 | SME | Regional/Grenoble | System's components | General Manager | 03/09/2014 | 75 min |
| Member 8 | SME | Regional/Lyon | Components/(PV) | Market Manager | 29/07/2014 | 74 min |
| Member 9 | SME | Regional/Chambery | Software; Consultancy /Energy efficiency-PV | Firm Director | 18/07/2014 | 66 min |
| Member 10 | SME | Regional/Chambery | Consultancy | 1) Head of the Regional Business Unit<br>2) Knowledge and Innovation Manager | 21/07/2014 | 37 min |
| Member 11 | SME | Global/Chambery | Energy demand/energy efficiency | R&D Manager | 23/07/2014 | 99 min |
| Member 12 | SME | Global/Grenoble | Components/smart grid (storage) | R&D Coordinator | 30/06/2014 | 61 min |
| Member 13 | SME | Global/Grenoble | Software/Energy efficiency | Firm Director | 24/07/2014 | 62 min |
| Member 14 | Start-up | Regional/Grenoble | Technology producer | Chief Operating Officer | 15/07/2014 | 65 min |
| Member 15 | Start-up | Regional/Lyon | Components/(PV) | Founder | 24/07/2014 | 60 min |
| Member 16 | Start-up | Regional/Chambéry | Technology producer/Biogas | Founder | 30/07/2014 | 56 min |
| Member 17 | Start-up | Regional/Grenoble | Technology producer/hydro | Founder | 02/09/2014 | 91 min |
| Member 18 | Start-up | Regional/Chambéry | Software/Energy efficiency | Founder | 07/07/2014 | 82 min |
| Member 19 | Start-up | Regional/Chambéry | Technology producer/(biomass) | Head of Strategy, Finance and Administration | 05/09/2014 | 81 min |
| Member 20 | Large | National | Research and development | Scientific Director | 17/12/2014 | 62 min |
| Cluster management 1 | | | | 1) Innovation project manager<br>2)Information system manager | 28/07/2014 | 57 min |
| Cluster management 2 | | | | General manager | 28/07/2014 | 58 min |
| 23 interviews in total, lasting 25h55m. Interviews took place face-to-face except those with Member 4, 10 and 15. | | | | | | |

Table 2: Effects of renewal on the structural and relational position of cluster members

| | | | |
|---|---|---|---|
| Setting 1 | Members fear to lose both structurally and relationally. Their business focus becomes less aligned with that of the cluster and they are less likely to collaborate with other members. | 1 member | Defy; Manipulate |
| Setting 2 | Members expect their structural position to improve as their business focus becomes better aligned with the cluster. However they think they will lose relationally due to increased competition or by risking to jeopardise existing strategic relations. | 2 members<br>2 members | Manipulate<br>No clear response |
| Setting 3 | Members expect their structural and relational position to improve as their business focus becomes better aligned with the cluster and they have more opportunities to develop partnerships. | 2 members<br>1 member | Encourage<br>Manipulate |
| Setting 4 | Members expect their structural position to improve as their business focus becomes better aligned with that of the cluster. However, they do not believe they will get additional opportunities to collaborate with other cluster members. | 2 members<br>5 members | Acquiesce<br>Avoid |
| Setting 5 | Members do not expect any impact of the renewal process. They opportunistically use the cluster and are generally satisfied with what they obtain from it. | 3 members<br>2 members | Acquiesce<br>Acquiesce |

**Legend:**

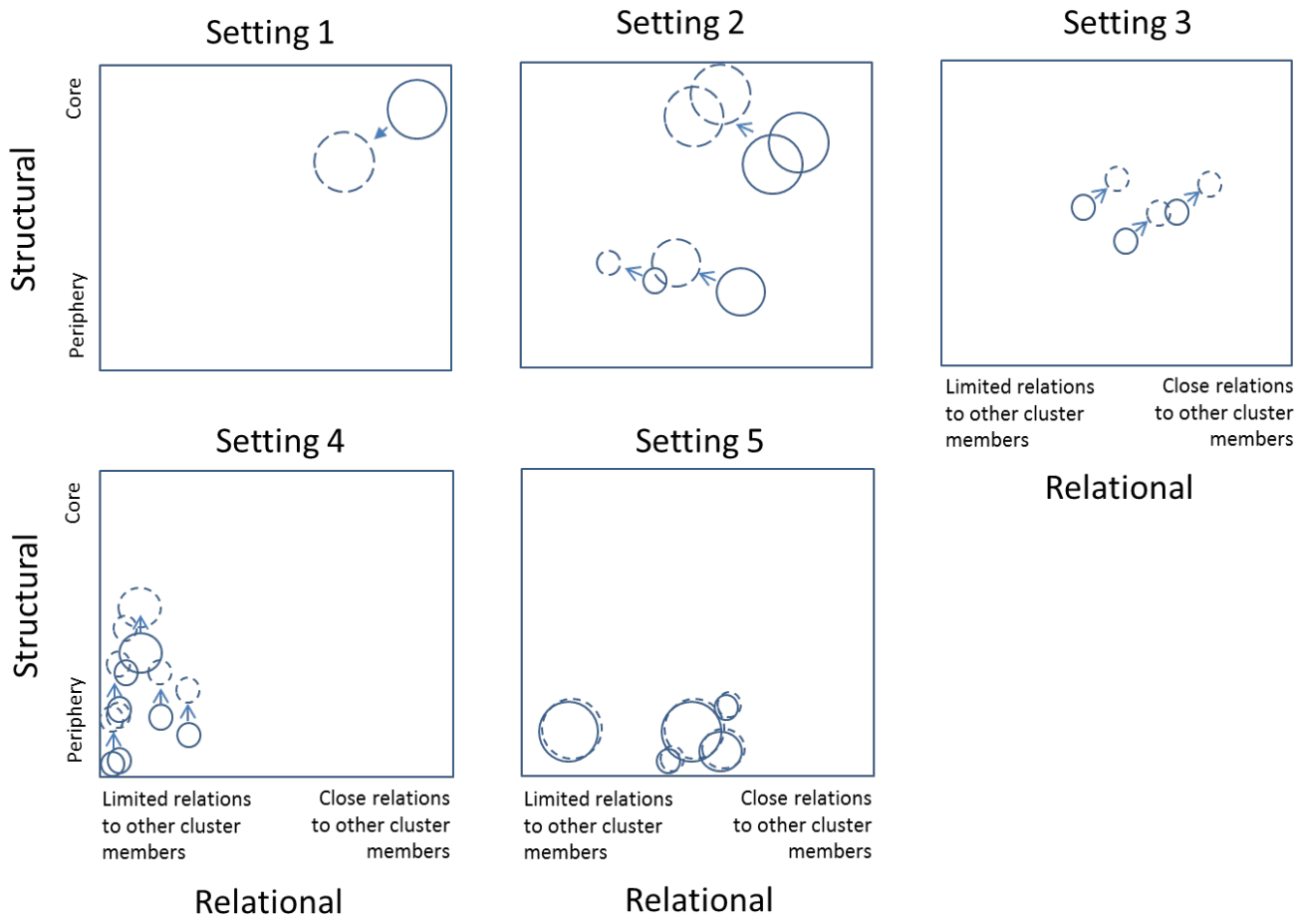


Figure 1: Cluster members' perceived impact of the cluster renewal