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The Role of Linked Legitimacy in Sustainable Business Model Development

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1. Introduction

Business models (BMs) are known to affect the activities businesses engage in (Zott and Amit 2010), and sustainable business models (SBMs) have been identified as a way to create more sustainable business activities (Seshadri 2013). However, it is not clear how SBMs develop, grow or spread (Abdelkafi and Täuscher, 2016 ; Zollo, Cennamo, and Neumann, 2013), which makes it difficult for policy makers and managers to engage with SBMs in a meaningful way. In this paper we look at how legitimacy as a resource is created through sustainable development projects and introduce the idea of *linked legitimacy* as a key driver for developing SBMs within the business ecosystem of the focal firm. Using data from three business cases, we explore different ways firms build and exploit linked legitimacy and how this leads to SBM development. We show linked legitimacy is a resource built around sustainable development projects, and thus is linked to principles of sustainable business strategies or action around sustainability (Arnould and Press 2011). We suggest that linked legitimacy can cross firm boundaries to be exploited broadly by ecosystem stakeholders. We re-conceptualize the rules of engagement for SBMs and show how linked legitimacy facilitates the development of SBMs across ecosystem stakeholders, without the need for a trans-organizational BM governing the projects (Seshradi, 2013; Kramer and Pfitzer, 2016; Nidumolu et al., 2014; Norheim-Hansen, 2018). That is, we propose a de-centralized, collaborative approach to SBM development.

2. Literature Review

2.1 Legitimacy

2.1.1 Firm-focused legitimacy

Legitimacy has long been a topic of interest in general management studies (Dowling and Pfeffer, 1975; Suchman, 1995) and, increasingly, in marketing research (e.g., Giesler, 2007; Humphreys, 2010; Press and Arnould, 2011, 2014). Legitimacy is the understandings about acceptable, desirable and appropriate actions (Suchman, 1995). Firm legitimacy is considered a resource necessary for getting other resources (Zimmerman and Zeitz, 2002). Thus, this resource contributes to firm success, especially with a fledgling endeavor (Sahaym, 2013). In an organizational context, legitimacy implies shared social worlds that coordinate stakeholder actions to reinforce the stability of a given social order (Press et al., 2014), and this order is reinforced by the expectation and effects of external order, including laws, social norms, and cultural habitus (Weber, 1978).

Legitimacy is a construct typically focused on one firm. Legitimacy for the focal firm comes from internal actions aimed at external stakeholders who then endorse the validity of the focal firm (Drori and Honig 2013; Johnson et al. 2006; Zimmerman and Zeitz 2002). Research on new ventures presupposes that legitimacy comes from the activities an organization engages in to build its own legitimacy, which is then given by external stakeholders based on how well the focal firm has succeeded in impression management (Tornikoski and Newbert 2007; Uberbacher 2014). Each action from the focal organization is a message that carries meaning that is used to assess the focal organization (Tost 2011), and external evaluation comes from perceptions of how the organization is viewed by various institutions (e.g. media, government, social institutions) (Bitektine and Haack 2015). However, this conceptualization constrains legitimacy to outcomes including accumulation of additional resources, customers, clients, and investors, all for the focal firm (Bitektine and Haack 2015; Drori and Honig 2013). In this paper we propose that, rather than being a firm-focused resource, legitimacy is created through

engagement with the market and thus is a resource that is available to actors in the focal business ecosystem for their own opportunistic purposes. The cases presented here illustrate how organizations in the focal ecosystem use legitimacy to develop their businesses.

2.1.2 Legitimacy is action-specific

Many studies of legitimacy in new ventures use an institutional approach, which supposes that legitimacy comes from shared beliefs about normal behavior (Meyer and Rowan 1977). In this approach, evaluators of legitimacy pay attention to what constitutes good business practice, or alternately, judgments about legitimacy rely on evaluations of external institutions (governments, financial analysts, industry associations, media) to confer legitimacy on a firm or industry (Uberbacher 2014). Another approach is for new ventures is to try to control external legitimacy judgments through “or manipulation of, audiences’ expectations and values (Uberbacher 2014, 681; Suchman, 1995; Zimmerman and Zeitz, 2002), similar to impression management (Tornikoski and Newbert 2007). New entrants with a sustainable development agenda can seek legitimacy in established markets by changing perspectives at a higher level or by changing the performance criteria of product options (Bergek, Jacobsson and Sandén 2008). This dovetails with suggestions to align with other entrepreneurs to build collective legitimacy for a general issue or product (Thompson, Purdy and Ventresca 2018; Weber, Heinze and DeSoucey, 2008; Wry et al., 2011) or to build legitimacy for a particular cause, such as sustainable forestry or fisheries, or general environmental or social issues (Crespin-Mazet and Dontenwill, 2012; Uberbacher 2014). All of this research identifies legitimacy as being enmeshed with a particular source. Thus, the focal firm does not receive a general “legitimacy” but a constrained legitimacy that is linked to a particular action or project. For example, one firm is bestowed with legitimacy

linked to good business practice, another firm gains legitimacy linked to good financial reports, another has legitimacy linked to commitment to sustainable forestry (specific cause). We refer to this as *linked legitimacy*.

Legitimacy in the sustainability space has been defined as a “general assumption by the supplier’s stakeholders that the actions of the firm are authentically respecting the three components of sustainability i.e. environmental stewardship, social equity and economic performance” (Crespin-Mazet and Dontenwill, 2012, 2009). Strategies for new venture legitimacy creation are echoed in the sustainability space and here they are tied to specific sustainable development projects (Crespin-Mazet and Dontenwill, 2012). Thus, linked legitimacy is tied to its origin and cannot be separated from it. Linked legitimacy as a resource may be taken by firms and used to build other projects, but only if those projects are consistent with the linked content of the legitimacy. For example, if a firm gained legitimacy around a sustainable forestry project, it could use that legitimacy to innovate new products that promoted the values, norms, and shared understandings and actions stemming from alignment with the cause of sustainable forests (Suchmann, 1995; Arnould and Press 2011). However, the firm could not use that legitimacy to innovate in ways that were oppositional to values, norms and understandings surrounding sustainable forestry. As linked legitimacy is developed as a resource, its uses are constrained by its linked meaning. In this article, we introduce *linked legitimacy* as a key to spreading SBMs across different business ecosystems. We argue that dynamic capabilities around building legitimacy will benefit firms and stakeholders, and will lead to proliferation of SBMs.

2.2 Sustainable Business Models

2.2.1 Business models and sustainable business models (BMs and SBMs)

A business model (BM) describes how firms create and capture value (Chesbrough, 2007; Zott and Amit, 2010; Zott et al., 2011; Foss and Saebi, 2017; Battistella et al. 2017). The activity systems perspective of exploring and analyzing business models employs elements that address the systemic nature of the content (what is done), structure (where and when is it done) and governance (who oversees the actions) (Zott and Amit, 2010). These ideas are useful in identifying how linked legitimacy affects sustainable business model (SBM) formation and innovation in business ecosystems. Ecosystems refer to the key actors (e.g. organizations, customers) and systems (e.g. policies, management systems, technological platforms) that make up a focal firm's operating environment (Aarikka-Stenroos and Ritala, 2017).

Today, the business model concept is relevant to drive the market toward sustainability (Lüdeke-Freund, 2010; Bolton et al, 2016; Foxon et al., 2015) and recent research has tried to identify how businesses are adopting SBMs. In general, the concept of SBMs builds off that of BMs, however, SBMs include an awareness of negative environmental and social externalities from organizational activities and a desire to address them (Teece 2010; Starik and Kanashiro, 2013). There is agreement that in SBMs, sustainability means value must be created along triple bottom line measures of the firm's performance, those that address environmental, economic *and* social issues (Stubbs and Cocklin 2008, 119; Elkington, 1997; Bansal 2002).

Conceptualizations about how organizations approach collaboration on sustainable development projects focus on a variety of structures, with an increasing number of demands on participating organizations. In many conceptualizations, collaborators engage a formalized shared vision (Kramer and Pfitzer, 2016; Nidumolu et al., 2014; Seshradi, 2013; Norheim-Hansen, 2018) and an overarching governance structure, whether that is part of their

collaboration (Sedrashi, 2013) or in the form of an external governance structure (Kramer and Pfitzer, 2016; Nidumolu et al., 2014).

While recent work indicates that elements of SBMs are being adopted by businesses, especially those connected to energy and material efficiency, circular economy and renewable energy (Ritala et al. 2018), it does not address SBMs at the conceptual level. A clear definition of SBMs is still missing (Schaltegger et al. 2016), however, there are some consistent themes. The SBM should have an explicit sustainability orientation that integrates triple bottom line concerns and be able to identify how the firm creates economic value without creating negative externalities (Schaltegger et al. 2016), have a broad notion of value creation and capture (Bocken et al., 2014; Hörisch et al., 2014; Lüdeke-Freund, 2010; Rauteur et al., 2017; Schaltegger et al., 2012; Schaltegger et al., 2016; Wadin et al., 2017) that is communicated broadly to explicitly-recognized stakeholders, and be able to identify for whom value is created (Evans et al., 2017; Lüdeke-Freund and Dembek 2017; Schaltegger et al. 2016). The implication is that sustainability must exist in a supply chain or ecosystem for a focal firm to successfully develop and employ a SBM (Crespin-Mazet and Dontenwill 2012; Pagell et al. 2010). Further, adopting an SBM is seen as a catalyst for the transition to sustainability across the ecosystem (Lüdeke-Freund, 2010; Bolton et al, 2016; Boons and Lüdeke-Freund, 2013; Foxon et al., 2015). However, there is very little discussion about how this happens for focal firms, let alone for business ecosystems and there is hardly any discussion on how SBMs actually develop. We identify legitimacy linked to sustainable development projects as a resource that organizations use to develop SBMs across overlapping business ecosystems.

2.2.1 Collaborative sustainable development projects.

While much of the work on SBMs focuses on individual firms, there is research adjacent

to SBMs that looks at sustainable development projects in the context of multiple organizations coming together. Past research has reported myriad reasons for entering into a stakeholder network for sustainable development projects, including sharing or reducing risk (Canzaniello, Hartmann, and Fifka 2017; Garriga, 2009), creating value for the organization's economic and/or environmental objectives (Chertow, 2007; Kumar and Malegeant, 2006; Zaoual and Lecocq, 2018), increasing reputation (Kumar and Malegeant, 2006) and gaining legitimacy (Canzaniello, et al., 2017, 390), benefitting from shared resources (Kumar and Malegeant, 2006; Teece et al., 2016 Norheim-Hansen, 2018; Dyer and Singh, 1998; Canzaniello et al., 2017; Zaoual and Lecocq, 2018), gaining power in the market (Eisenhardt and Schoonhoven, 1996; Hagedoorn, 1993), and increasing capabilities including dynamic capabilities (Canzaniello et al. 2017; Norheim-Hansen, 2018).

Further, this work has highlighted challenges in collaborations stemming from trust issues and opportunistic behaviors (Porter and Kramer 2011; Snehota and Hakansson, 1995; Munksgaard and Medlin, 2014), from power differentials between small and large (entrepreneurial and MNC) organizations (Wadin, Ahlgren, and Bengtsson 2017), and from missing information (Zaoual and Lecocq, 2018). In imbalanced power relationships, building dynamic capabilities for the alliances helped neutralize this imbalance (Wadin, Ahlgren, and Bengtsson, 2017). However, what drives successful collaborations and what causes SBMs to grow remains unclear.

Past work suggest different formats for collaboration, from formalized eco-industrial parks organized around industrial ecology (Chertow, 2007; Egan, 2011; Decouzon et al, 2015), some of which emerge spontaneously and others of which are planned (Chertow 2007; Zaoual and Lecocq, 2018), to a model build by a matchmaker who identifies needs, resources and waste

across multiple firms (Zaoual and Lecocq, 2018). Finally, sustainability syndicates offer a different model to organize collaboration across multiple groups of organizations is in a (Seshadri, 2013). This is a formalized trans-organizational model (structure) with a “unifying agenda” that “unifies ethical and economic rationales for shared responsibility [to achieve] superior sustainability value through differentiation” (content). Seshadri (2013) argues that “unavoidable conflicts from divergent goals remain unresolved even with plural governance” (Seshadri, 2013, 770) and suggests a combination of governance contracts to provide recourse for violations of trust (Seshadri, 2013, 769), a view supported by research on creating common goals across business networks (Matinheikki et al., 2017). In this paper we explore how SBMs can develop in ways that do not necessarily require agreement on high-level “unifying agendas,” or enclosed shared governance.

We wish to counter two points about sustainability. There are that “[1] sustainability strategies demand shared responsibilities...[and 2;] efforts are risky and involve significant financial commitments” (Seshadri, 2013, 765). These ideas promote the belief that sustainability strategies are both risky and costly for organizations (Connelly, Ketchen and Slater, 2011; Beckmann, Hielscher and Pies, 2014; Sancha, Gimenez, and Sierra, 2016). This perspective effectively limits a firm’s ability to see innovation opportunities in these constraints and runs counter to industry commentary (c.f. Winston, 2018). We present a different conceptualization of SBM where groups of organizations interact in overlapping ecosystems, building and using linked legitimacy for innovation opportunities. Here, linked legitimacy is the key resource that is created, shared, exploited. We contend that it is linked legitimacy that enables each business to further innovate in its own ecosystems and continue to expand the SBM.

3. Context

Data were collected in the "Hauts de France" region (in the north of France), which has experienced several economic upheavals during two industrial revolutions, in the coal, iron and steel industry (19th century) and in the textile industry (20th century). These industrial revolutions traumatized the region, challenging its identity. In the 1980s, regional policy makers decided to engage in activities that would shift the economy toward embracing sustainability, and improve the image of the region as a now defunct industrial area. In the 1990s, regional authorities enacted public policies to modify industrial activities (Maillefert, 2009) and since then the "Hauts de France" has become known for experimentation with sustainable innovation. The region pioneered the development of recycling structures, implemented the first large-scale wind turbines, and delivered the first use of hydrogen in the French gas network.

In 2013, "Hauts de France" decided to promote sustainability as a regional development model. Over the course of nine months, regional governmental agencies worked with a diverse group of over 120 actors to develop "Rev'3," the long-term plan for the area. This plan focuses on the use of renewable energies, new ways to produce and consume responsibly, sustainable mobility, improvement in quality of life, well-being, and job creation. Since 2014, more than 62 companies in the region have been labeled "Rev'3," meaning they place sustainable development at the heart of their BMs.

4. Methodology

Our goal is to build theory on how legitimacy affects SBM development. We use a methodology based on multiple case studies to advance the conceptualization of the role of legitimacy in SBM development (Eisenhardt 1989; Ridder 2017). This method is appropriate for

contemporary and empirical phenomenon (Eisenhardt and Grabner, 2007; Yin, 2009). Following Eisenhardt (1989), we use a comparative analysis within and across three case studies to identify processes of legitimacy development and SBM expansion. As Eisenhardt (1989) states, developing a theory from case studies consists of exploiting one or more cases to bring out propositions or even construct an inductive theoretical construct from a data collection.

This methodology seems entirely appropriate for studying the "how" or the "why" in a world of little research (Yin, 1989). We selected three companies engaged with the energy sector (Gecco, ArcelorMittal and Dumont). The energy sector illustrates a diversity of approaches to integrating sustainability into business models. Cases were selected based on theoretical criteria (Ridder 2017): they focus on innovative sustainable development projects; they are engaged with different parts of the same industry; they address multiple stakeholders; and they act through a variety of phenomena. In addition, highlighting three cases from the same sector allows us to explore similarities and tensions in the SBM ecosystems (Eisenhardt et Grabner, 2007). The innovations of the SBM in the three cases are diverse both in terms of the nature of innovation and the development of the ecosystem.

Data were primarily qualitative and collected through interviews, documents, and observations (Ridder 2017). In 2016 and 2017, we conducted semi-structured interviews with managers and/or owners in each company, with key stakeholder, and with managers and owners at each company (Eisenhardt, 1989; Yin, 2009). Interviews focused on sustainable innovation in each firm, including the impetus and origins for the disruptive modifications to the business, how partnerships and relationships were developed and how they are maintained. In total, we conducted 28 interviews, which lasted between 20 minutes and three hours and 20 minutes (90 minutes on average) (see Table 1 for details). Each interview was recorded and transcribed.

Interviews were analyzed by multiple researchers to give complementary points of view, reinforce the richness of the analysis and the confidence in the results. (Eisenhardt, 1989). In addition, we engaged in participant observation (Leonard-Barton, 1990) at company meetings and forums on energy transition for entrepreneurs (see Table 1 for details). Finally, we collected secondary data from 2014-2018 examining sources including as company websites, corporate, NGO and administration reports, local newspapers, information in social media and other artefacts (Mariadoss, Tansuhaj, & Mouri, 2011). Including multiple data sources helps increase the credibility and consistency of the findings (Jick, 1979) and contributes to the validity of our results (Leonard-Barton, 1990; Woodside and Wilson, 2003).

First we analyzed primary data within each case according to the elements of the activity systems perspective Zott and Amit (2010, 2011). We mapped the actors in the ecosystem to highlight key stakeholders and their role in creating legitimacy. Second, we cross-referenced primary and secondary data to check details and arrive at a coherent picture of the firm and its ecosystem. Third, we iteratively wrote the cases highlighting key actors, legitimacy creation and SBM development.

5. Findings

We present cases from three companies that engage in sustainable development projects that touch on the energy sector. Gecco has developed a BM based on the transforming waste into fuel, Dumont has a vision of integrated value in building projects, increasing energy efficiency, and ArcelorMittal engages in projects that directly address local environmental and social issues, including transforming waste heat into residential heat and electricity. We discuss each case from

the point of view of the focal firm, and also offer insight into how others in the ecosystem were affected by actions, choices, and alliances.

5.1 Gecco

The first case illustrates how the focal firm used linked legitimacy created through relationships to obtain financial funds, develop a scientific research program and diversify its products and activities. At its start in 2007, Gecco collected used oil from restaurants and chip shops and sold it to a Belgian intermediary that re-sold it to biodiesel plants in Europe. In 2010, Gecco's founder and a scientific associate began developing a biological process to transform used oil into biodiesel, so that oil collected locally could be transformed into biodiesel and used locally. In 2017, Gecco began a pilot program selling the city of Lille some of the locally processed biodiesel.

5.1.1 Key actors

Gecco built a network of players that create a web of value (Porter, 1980) for its key stakeholders. At the beginning, Gecco's founder was actively looking for connections to build his biodiesel business. Because he was involved in social business networks and a partner of APES, a social business incubator, his actions were recognized as useful by the state French Ministry of the Economy. This immersion in social business allowed him to join Ashoka, an international group for social business. It was through Ashoka that the founder of Gecco developed his relationship with McCain, the world's largest frozen French fry producer. McCain already had a well-established CSR program and was looking for additional local CSR collaborators. In addition, Gecco was recognized by the state French Ministry of Agriculture,

making it an attractive partner to McCain. The Alliance network, a prestigious regional organization that supports businesses interested in sustainable development, gave Gecco initial legitimacy in the business world. Gecco’s founder successfully forged connections with the City of Lille at a moment when the city was politically motivated to reduce emissions from their vehicles, support local businesses and develop partnerships with local startups. Finally, Gecco built a relationship with the University of Lille to create a lab to develop a biological biodiesel production technique; this lab was funded in part by EU grants and support from McCain.

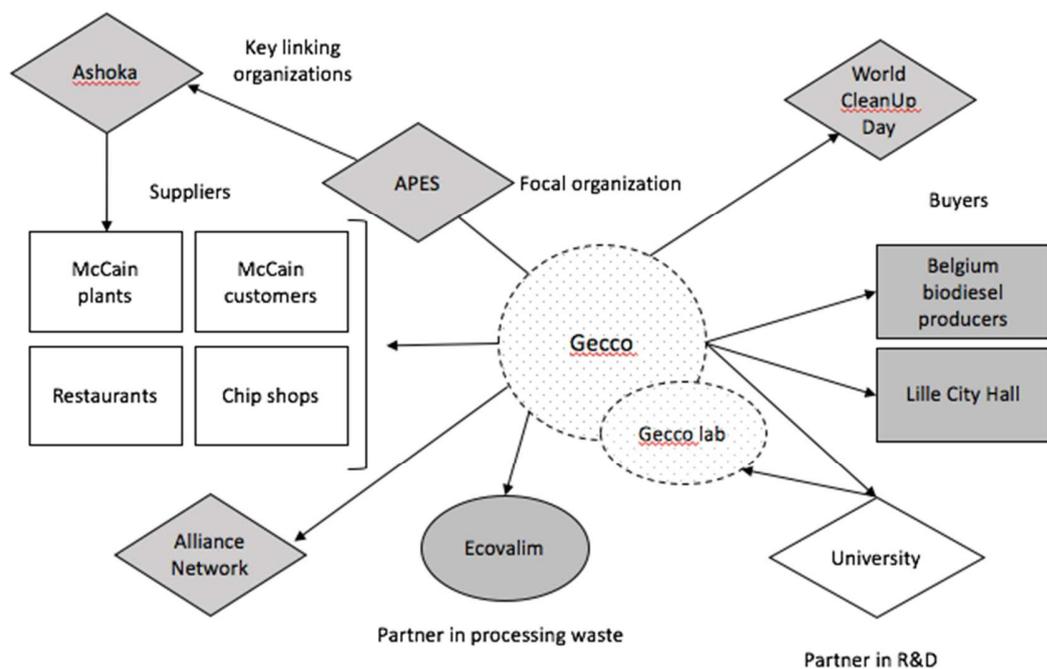


figure 1: Gecco’s key actors

5.1.2 Business development and firm-focused legitimacy

Gecco has worked on several projects, including waste collection, biodiesel production, and consulting. Gecco benefitted from national recognition from the Ministry of Economy and

Ministry of Agriculture that gave it an early boost as a business engaged in important work. Gecco used this early recognition plus its social networks to build the strategic partnerships it needed to grow. The Alliance network helped Gecco emerge as a “real business” that was engaged in issues around waste, alternative fuels, and circular economy, rather than *just* a social business.

Part of Gecco’s plan was developing a biological (non-chemical) procedure to transform oil into biodiesel, which remains a novelty for biodiesel production. In 2010, Gecco received technological support from the University of Lille as well as significant support from many small individual donations collected through APES to develop its biodiesel process. Over the next five years, Gecco successfully developed the biodiesel process, which was overseen by a PhD candidate in biochemical engineering who was funded by Gecco. This process added research and technology to Gecco’s linked legitimacy.

The relationship with McCain gave Gecco formal access to the used oil in their factories, opened a network of restaurants to collect used oil, and significantly increased the amount of oil Gecco was collecting, creating stability in terms of accessing its main material input. In 2014, McCain contributed funding to Gecco’s lab to help promote the development of their biodiesel technology, solidifying McCain’s role as a key player in Gecco’s network. In 2016, Gecco received an EU grant under the Life program to further develop their lab.

While it was perfecting its biodiesel production, Gecco built a relationship with the City of Lille that leveraged Gecco’s linked legitimacy as an answer to the City’s political pressures. In 2017, Gecco began a pilot program selling its biodiesel to the City of Lille to power a bus, a street washer and street sweeper. Gecco’s BM transformed from passing fry oil through its supply chain to a BM focused on transforming local waste into locally-used product.

In 2016, Gecco's founder recognized a market opportunity to spearhead a "total solution for all organic waste" from restaurants. He started building collaborations with diverse businesses that process different types of restaurant waste, (e.g. Ecovalim, a company that processes coffee grounds into fire logs). In addition, Gecco recently started a consulting and training program, helping project leaders in other regions of France navigate regulations, certifications, collection logistics, and build an efficient and circular waste collection program. Finally, the founder of Gecco was recently asked to serve as president for World CleanUp Day France, a forum that raises awareness about the proliferation of waste and encourages citizens to "clean the planet in a day." This new position gives Gecco a national platform to find the stakeholders it needs to create and manage a national network of recycling franchises, develop additional biodiesel processing facilities, and further develop its consulting business.

In each of these projects Gecco and its partners develop legitimacy linked to the specifics of the project (e.g. circular economy, waste management, social business). In addition, they work to develop capabilities to exploit the linked legitimacy in other projects. Gecco has been recognized in social enterprise circles as a model of success, in enterprise circles as a way to address CSR goals, and in government circles as an example of how to engage local business and enact sustainable development goals.

5.1.3 Legitimacy benefits for ecosystem partners

Gecco's partners also benefit from the linked legitimacy created in their projects and relationships. McCain's partnership with Gecco represents a way to bolster existing CSR activity. The partnership supports McCain's policy to develop social businesses in the region, it expands McCain's CSR story by addressing downstream waste in their supply chain and

highlighting engagement with circular economy project, and thus, it helps McCain build legitimacy with local potato farmers and customers. Supporting Gecco's biodiesel production process further solidified McCain as an innovative leader in CSR in their industry.

The City of Lille partnered with Gecco in a politicized move to buy local biodiesel to promote energy autonomy in the region. The City of Lille benefits from its relationship with Gecco in several ways; it fits into a city policy to end the use of diesel in municipal vehicles (more vehicles will be powered by biodiesel in the future), promotes energy autonomy, improves air quality, adds jobs through collaboration with startups, and generally provides political and reputational support for the City. Linked legitimacy developed through this partnership improved Lille's reputation as an innovative city because it supports local business innovations and works toward a circular economy. In addition, the European Life funding program plans to replicate Gecco's BM, both the innovation in technologies and relationships, in France and other European countries.

While the structure and governance of individual projects remain with Gecco, benefits from linked legitimacy are shared, allowing stakeholders to develop new projects. Further, stakeholders beyond those directly engaged in projects with Gecco also benefit from access to Gecco's linked legitimacy and use this resource to address their own goals. For example, the social business network promotes Gecco as a great example of how social business can be relevant and innovative, which helps the network gain additional support from funders. In these ways, linked legitimacy emerges as a key resource in developing and expanding SBMs across the overlapping business ecosystems of Gecco and its stakeholders.

5.2 ArcelorMittal Dunkirk

The second case illustrates a model in which the focal firm reluctantly adopts sustainable development projects as a result of external pressures. ArcelorMittal is one of the largest steel producers in the world. It employs over 230,000 people in 60 countries worldwide. ArcelorMittal is the dominant firm in a large industrial park on the northern coast of France in the Dunkirk-Grande Synthe zone. On its website it states it is one of the leading industrial sites in France in terms of energy recovery. It describes the efforts it makes toward sustainable development along the coastline, promoting biodiversity, for example (ArcelorMittal, n.d.). However, while ArcelorMittal became the dominant company in the region in terms of employment and economic generation starting in the 1960s, it also disfigured the coastal landscape and generated an enormous amount of pollution. For many years, local residents have pressured ArcelorMittal to improve air quality by reducing industrial discharge. At the same time, Dunkirk is plagued by high unemployment due to the decline of industry and this steel mill has been a stable source of employment for people in the region. Since the 1990s, sustainable development projects taken on by ArcelorMittal stemmed from an urgency to respond to social and regulatory pressure.

5.2.1 *Key actors*

Early impetus for ArcelorMittal to engage in sustainable development projects came from non-business actors in their ecosystem. In the late 1970s, there was increasing conflict among companies, local residents and representatives of environmental NGOs. In response, local authorities in Dunkirk created two entities. The first, Opal'air (initially AREMADE), was created in 1976. It was a collaboration among the cities of Grand Synthe and Dunkirk, the central government, the Dunkirk Chamber of Commerce and Industry, local businesses, and environmental NGOs to measure and publish official air quality indices. Continued demands for

healthy air led to the creation the secretary for the prevention of industrial pollutions (SPPPI) in 1990. SPPPI is a regional body that publishes reports on “air, smells and noises” and helps actors jointly identify targets for pollution limits, using reporting from Opal’air. These two entities had enough sway to oblige ArcelorMittal to address its practices and alter the content and structure of its BM. In 2001, a network of actors including both big companies such as Arcelor and SMEs developed an association to promote industrial ecology (ECOPAL). ECOPAL was recognized as part of the EU’s “Answers to the Carbon Economy” project.

Key business actors in ArcelorMittal’s ecosystem include Dalkia, a company that specializes in increasing energy efficiency and developing renewable energy and GDF, France’s largest gas company. ArcelorMittal built extensive projects with both these companies. Recently, new firms interested in accessing ArcelorMittal’s waste are joining the ecosystem and developing industrial ecology projects in Dunkirk.

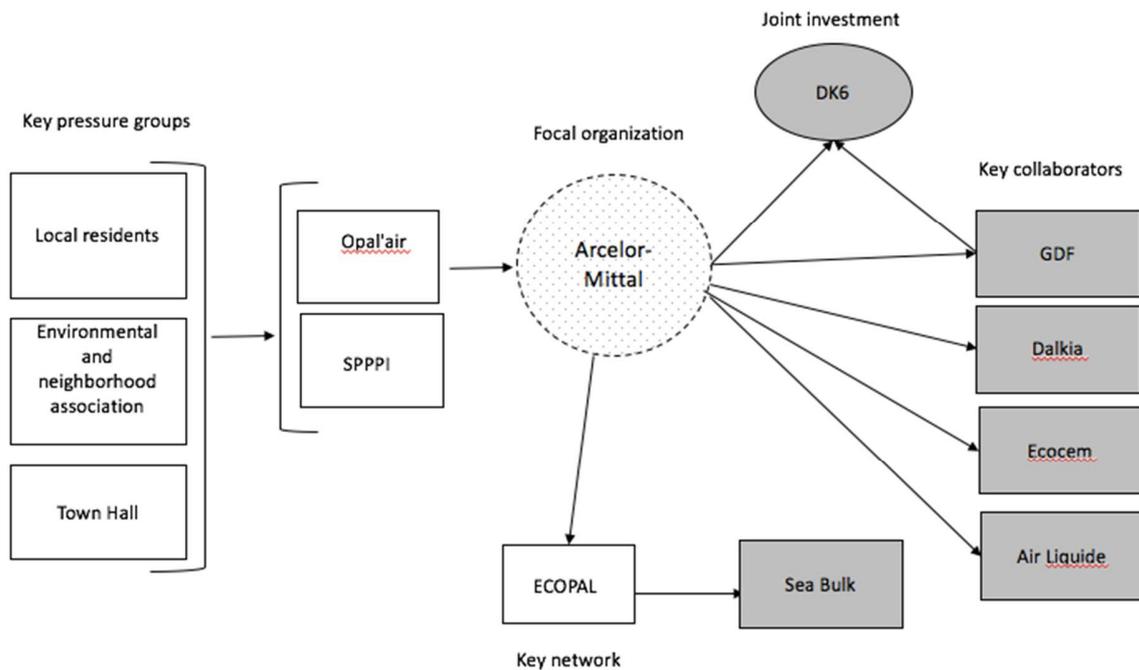


figure 2: ArcelorMittal's key actors

5.2.2 Business development and firm-focused legitimacy

Starting in the 1960s, ArcelorMittal had relationships with private actors that revalorized its industrial waste; these were motivated by economic gains. As in other industrial ecology examples (Chertow 2007), it was not until an outsider provided an environmental lens that ArcelorMittal began identifying such projects as anything beyond economically beneficial. In 1983, as part of an effort to reduce regional dependency on fossil fuels, the city of Dunkirk selected ArcelorMittal to build a district heating scheme with Dalkia. This heating system recovers steam from ArcelorMittal's blast furnaces and provides heat to over 6,000 private and municipal buildings, apartments and houses. In the partnership, ArcelorMittal gives the steam to Dalkia, but charges a "right to use" fee for the land to build the pipes to transmit heat to the

dwelling. ArcelorMittal gained economic benefit from the partnership and decreased risk management costs by removing the need to cool steam in its industrial system, which is a potential serious health risk (like *legionellosis*). This project is managed by Dalkia. This was one of the first examples of industrial ecology in France and was, and still is, widely praised, generating legitimacy linked to industrial ecology for ArcelorMittal. In November 2009, this heating network was recognized by the International Energy Agency for its relevance to sustainable development, generating more linked legitimacy.

In the early 2000s, ArcelorMittal partnered with Gaz de France (GDF), which funded the building of DK6, a combined cycle power plant that captures gas emissions from the steel factory and converts them into electricity. DK6 is a textbook example of industrial ecology because it recovers waste from steel plant gas emissions and converts it into electricity, most of which is then used by the steel plant, the rest is sold on the energy market. ArcelorMittal again benefits from the reduction plant emissions and from the electricity. These two capture and transformation projects monetized waste, decreased negative externalities, and created legitimacy linked to industrial ecology, waste management, and sustainable development. In addition, following ECOPAL's inventory of material flows in the Dunkirk area, ECOPAL was able to connect ArcelorMittal with Sea Bulk, a firm that had technology to recover iron from fleet waste, which ArcelorMittal was then able to reuse.

ArcelorMittal is now attracting other manufactures that recognize potential for the waste and by-products generated by its blast furnaces. Ecocem France, a manufacturer of ecological cement, has just created a second production unit near ArcelorMittal Dunkirk to recover the steel slag to produce low carbon cement. A project with Air Liquide is underway to recover hydrogen produced during the coal combustion to use as fuel for new generation vehicles. The

multiplication of projects enables ArcelorMittal France to position itself as a key innovator in industrial ecology and to participate in EU-Sponsored research projects. Finally, as a demonstration of commitment to circular economy, ArcelorMittal now has a webpage devoted to the topic.¹

These projects illustrate how ArcelorMittal added new content and activities to its BM by joining forces with both big and small companies and responding to local pressure groups to address environmental and health concerns (Zott and Amit, 2010). ArcelorMittal's structural investments and partnerships with reputable companies signal a commitment to sustainable projects, now embraced by the company. These projects build linked legitimacy for industrial ecology and pave the way for ArcelorMittal to replicate them at its other plants. The ongoing tension with local residents and environmental groups remains, as does pressure to continue work on environmental projects.

5.2.3 Legitimacy benefits for ecosystem partners

These projects were useful not only for ArcelorMittal, but also for other members of its ecosystem (Crespin-Mazet and Dontenwill, 2012). GDF and Dalkia each gained economic value from the linked legitimacy they created with ArcelorMittal, improving the image and acceptance of a polluting industry in the region. Access to legitimacy linked to industrial ecology enabled Dalkia to focus on developing innovative energy recovery solutions and industrial ecology. Dalkia now manages about fifty heat networks in the Hauts-de-France. Likewise, ECOPAL has been able to demonstrate the technical, economic and environmental reliability of industrial ecology and “initiated new behaviors based on mutual trust and openness, a spirit of cooperation,

¹ <http://www.arcelormittalinfrance.com/developpement-durable/economie-circulaire.aspx>

and a focus on collective responses to environmental challenges” (Zaoual et Lecocq, 2018, p 145). Finally, linked legitimacy developed in this ecosystem is used by the Urban Community of Dunkerque, a regional project focused on constructing regional energy excellence, promoting circular economy and reinforcing of the regional attractiveness.

5.3 Dumont

The case of Dumont illustrates specific challenges in creating linked legitimacy through social networks. Dumont is a family company created in 1949. For most its existence it has focused on installing electrical, heating and plumbing systems for companies and residences. Today it employs 35 people.

Didier Dumont, the son of the founder, has a personal passion for sustainable development. In 2003, he took over the family business and he decided to focus on sustainable development by advocating for renewable energy installations among its clients (geothermal energy, heating and solar water, Canadian wells). In 2014, Dumont decided to extend this strategic change into a more challenging ideological change (Press et al. 2014) and wanted to transform the business from a product logic to a service logic (Barquet et al, 2013). In B2C work, Dumont develops holistic energy solutions with each client, making suggestions for improvements and highlighting the quality of the service (e.g. responsiveness, respect of commitments, deadlines). This is the core of his business, however he wants to work on larger B2B projects. In B2B work, Dumont developed a value proposition to design and build sustainable housing projects that meets triple bottom line needs. He uses the concept of sustainable housing, which includes health (materials, electromagnetic waves), environmental (reduction of energy consumption and use of local products), and social (e.g. mixing generations,

low-income housing) issues. While he has developed many product-oriented projects, so far he has had difficulty initiating sustainability-focused projects in B2B contexts.

5.3.1 Key players

Dumont has built his vision for holistic housing development projects through his networks. This includes a mix of business networks such as the Centre des Jeunes Dirigeants de France (CJD), a National business group that supports entrepreneurs and which he was president of. CJD gave him access to many small firms. He also worked in more sustainability focused networks like the Alliance network, which coaches companies on how to develop their CSR initiatives. Through the Alliance network, he was able to create Club Noé in 2013, a group focused on the functional economy. He then started a sub-interest group called Habiter, which brings together 15 companies committed to sustainable housing to respond to large calls for proposals. It was also through Habiter, that Dumont met Delecroix, a carpentry firm, and Sylvagreg, a firm specializing in the design, construction and renovation of sustainable housing (among others) who became partners for his B2C service offerings (See figure 3). He is also involved with a national construction industry group (Groupement économique sanitaire électricité chauffage – GESEC), which brings together more than 300 small companies in France to facilitate collective responses to large contract bids.

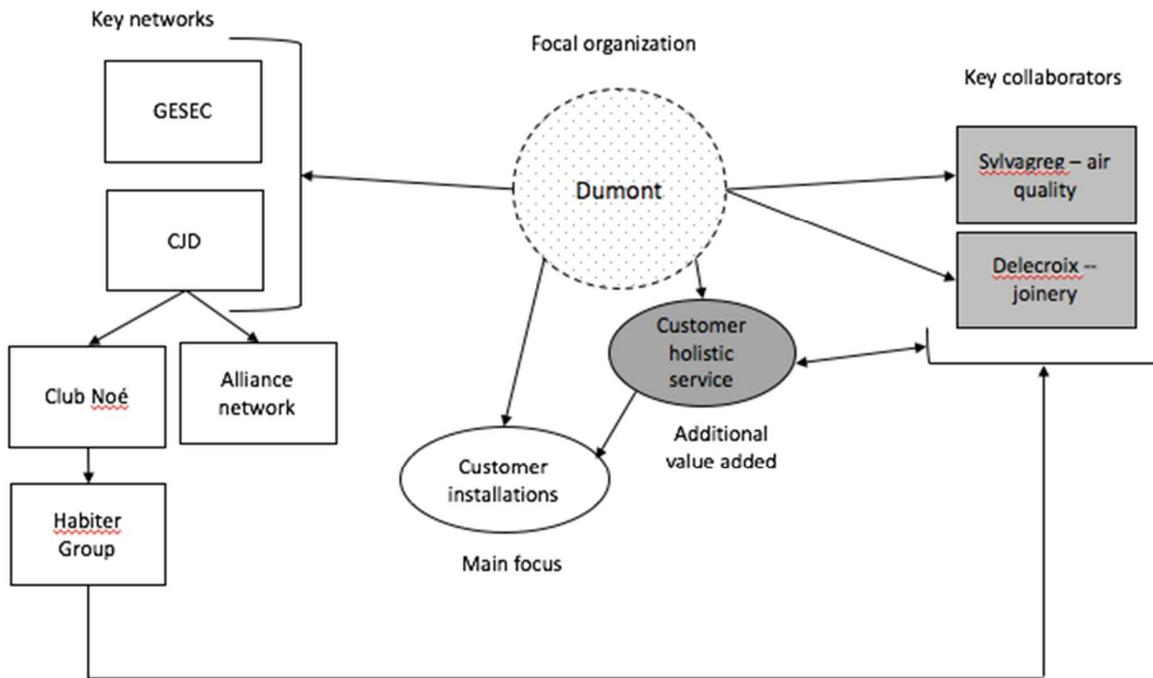


figure 3: Dumont’s key actors

5.3.2 Business development and firm-focused legitimacy

Dumont has dedicated himself to creating a vision of an ideal housing development. Over the past four years, with the help of various experts he has articulated this vision in terms of the environmental impact of building and taking into account environmental efficiencies, done costing from a long-term perspective and chosen materials based on lifecycle analysis and environmental and health implications, designed social spaces, and incorporated solutions for disabled residents and low income residents. His vision is compelling on economic, environmental and social dimensions. In addition, Dumont responds to large bids through the Habiter group. As a result of this cooperation, he has been a finalist for large housing

development bids, but has not won any contracts. Thus, he has been unable to work on large residential development projects.

We will now highlight some of the constraints to Dumont's success. First, Dumont offers holistic bids, which are difficult for developers to understand because they are used to receiving separate bids for each functional area (e.g. building, plumbing, heating, glazing). Plus, Dumont includes things that developers do not know how to judge such as social mediation in case of conflict, modularity of housing over time, and participation of the client in the different steps of construction. Second, there is not currently external political or regulatory pressure on developers to build more sustainable housing from any perspective (e.g. long-term costing, environmental, social, health), so they have little incentive to partner with Dumont. Third, Dumont has not found a developer-partner who understands his vision, sees the economic potential, and is willing to be his advocate in the marketplace. Thus, Dumont is in a position of trying to gain legitimacy for his vision while remaining stuck outside the marketplace. Without working on an actual project that enacts the ideals of his vision, Dumont's efforts as a spokesperson for his vision build reputation, which marks him as a visionary in his circles, but do not build linked legitimacy to enter the marketplace. A final constraint is the resistance of Dumont's employees to the change he proposes. Offering renewable energies and housing rehabilitation was easy for employees, but new services are difficult for employees. They are being asked to change from a builder/installer to a sustainable housing advisor. Thus, employees are not very engaged. While Dumont has not had success with his holistic housing vision, he has only been trying for four years and it may just take longer for him to influence how the building industry functions in France. He could be laying the groundwork for future change by infiltrating many small organizations and other grassroots efforts in social networks.

5.3.3 Legitimacy benefits for ecosystem partners

Benefits for ecosystem partners are minor because legitimacy linked to Dumont's holistic vision has not been created. However, legitimacy linked to a holistic service offer has developed within the group Habiter. As this group has gained the support of the region and the Chamber of Commerce and Industry, more businesses have joined and specific businesses in Habiter have found new work based on holistic sustainable solutions. For example, Delacroix found new customers by offering a more substantial value proposition and additional services, and Sylvagreg altered its focus to maintenance of homes owned by an aging population and exploration of shared housing projects. However, members of Habiter face the same obstacles mentioned above concerning their interaction with real estate developers, and fail to win substantial tenders. It is possible that linked legitimacy built among the actors in Habiter could become a resource that allows them to access ecosystems open to partnering. So far, however, linked legitimacy, and indeed the holistic vision remains with small firms working on small projects.

5.4 Linked legitimacy across cases

Our cases illustrate how linked legitimacy is developed as a resource available for ecosystem stakeholders to use for future projects. In this way, organizations take on new sustainable development projects, which change their BMs as they add new content, structure and governance. As legitimacy linked to sustainable development projects grows, organizations recognize more opportunities to leverage it and SBMs grow, spread (even into other ecosystems) and are solidified through ongoing activity (see figure 4). Further, as linked legitimacy grows in

scope, reputation and popularity, it becomes known and understood as a valuable and rare resource. Other ecosystem partners recognize the value of the resource and opportunistically seek to exploit it for their own projects, which may be only marginally linked to the firm that created the linked legitimacy.

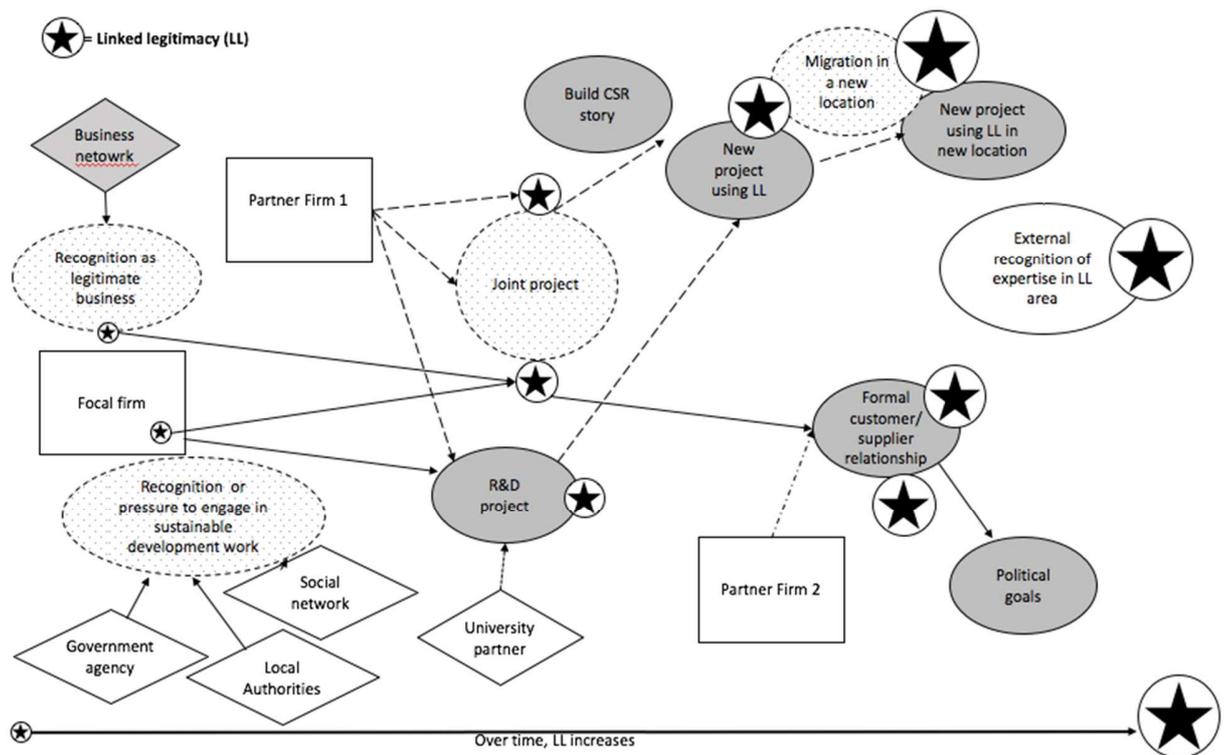


figure 4: Linked legitimacy growing in a business ecosystem

Linked legitimacy illustrates one way that businesses identify opportunities for innovation and open their boundaries. Our cases show different examples of how firms do this. Gecco collaborates opportunistically and expands cautiously, retaining a clear value proposition and governance over its projects. Gecco uses linked legitimacy directly to build and expand the activities and content of its business model to open the door for bigger projects. Further, Gecco

linked to larger cultural and political pressures in the region and found support from a large partner. Linked legitimacy is used by partners for their own projects.

ArcelorMittal is diligent in keeping control of the structure of its sustainable development projects. It controls the main economic activities of the firm while collaborating with social networks, governmental bodies, and NGOs to leverage legitimacy and good will gained from new projects. ArcelorMittal creates legitimacy linked to its expertise around industrial ecology. Over many years, it has learned how to interact with local residents/government/NGOs, even when it is contentious. ArcelorMittal illustrates how a firm can change over time as it engages in sustainable development projects; shifting from reluctant to publicizing their efforts. Linked legitimacy created by ArcelorMittal is used by ecosystem stakeholders to promote their own projects, including by the City of Dunkirk to promote itself as a green industrial city.

Dumont collaborates with a limited number of businesses and builds its value proposition through social networks. He is interested in creating linked legitimacy around an ideology, but the idea remains caught at the level of social networks and has not spread into the market. This case illustrates the necessity of concrete actions in the marketplace to build linked legitimacy. It could be that because of his activity in networking circles, we will eventually see entrepreneurs who have been touched by his grand vision emerging with new businesses that enact these values. It could even be that he will gain traction in the B2B arena, but so far there has been no indication of this.

6. Discussion

6.1 Legitimacy and SBMs

Past work has framed SBMs in a cautionary tone, pointing out transaction costs, sustainability costs, opportunism, and a lack of a shared goal (Connelly et al., 2011; Beckmann, et al., 2014; Sancha et al., 2016); our cases illustrate that firms can work on joint projects while having different specific goals that are fulfilled by the same project. We show how SBMs can develop in an overlapping ecosystem model (see figure 4), through creation of linked legitimacy that can be used by several stakeholders, without the need for a trans-organizational BM governing the projects (Seshradi, 2013; Kramer and Pfitzer, 2016; Nidumolu et al., 2014; Norheim-Hansen, 2018). Thus, for example, Gecco transforms used fry oil into biodiesel and the City of Lille wants to reduce fossil fuel consumption and support local entrepreneurs. A common desire to engage with sustainable development projects, a common need for legitimacy, and a recognition that joint work and association with each other makes the linked legitimacy available to both parties incentivizes each organization to engage and increases likelihood that they achieve their goals. Further, we suggest that as linked legitimacy is created and spreads through stakeholder ecosystems, the structure, content and governance (BM elements) of sustainability projects are solidified. As legitimacy bolsters sustainable development projects, shapes BMs, and spreads across the focal firm's ecosystem and beyond, SBMs are also solidified. Thus, linked legitimacy that increases positive externalities and decreases negative externalities also builds SBMs. Without the antagonistic, constraining viewpoint of a risk-laden approach to adopting sustainability (Snehota and Hakansson, 1995; Seshadri, 2013; Munksgaard and Medlin, 2014), organizations can create this resource, use it to operate as self-interested entities (Williamson, 1975), and at the same time be motivated to preserve and capitalize on linked legitimacy, thus innovating more sustainable development projects and expanding their SBMs.

The overlapping ecosystem model of SBM development that we present here has lower barriers to entry than models that propose overarching governance. Because governance rests with individual firms, or is shared only on specific projects, it is not as daunting or disruptive for firms to join. Indeed, identifying opportunities for legitimacy creation is motivation for firms to collaborate; successfully exploiting a valuable resource in linked legitimacy may motivate firms to remain committed to sustainable development goals. Further, sharing legitimacy opens the door to future collaborations that could use linked ecosystems to address broader goals from different access points.

We find factors that affect both the creation of and the ability to use linked legitimacy in our cases. Internal factors include whether the firm is able to understand market needs in terms of the resource provided in the linked legitimacy. That is, whether the firm has the capabilities to identify market needs in terms of content and communication. In addition, we find that whether a firm has internal buy-in for its strategic development direction affects its course of action (Drori and Honig 2013; Press et al. 2014) and ability to develop and exploit linked legitimacy. Further, having a marketplace partner who acts as an advocate for the focal firm helps develop projects in the market. External factors include the presence of political or regulatory pressure, which can accelerate the pace at which sustainable development projects are found, created and enacted. Finally, our data indicate that heterogeneity in ecosystems lends itself to increased and more creative sharing of ideas and seems to lead to more opportunities for innovation and success. These factors identify rich areas for future research as well.

6.2 Managerial implications

BMs help firms identify different ways they can create value. Past work has called for a

better understanding of how BMs are created and change (Zott and Amit 2010; Achtenhagen et al. 2013), and for identifying supporting and enabling conditions for BM innovation (Battistella et al 2017; Schneider and Spieth 2013). The same clarifications are needed for SBMs. If we want businesses and institutions to engage more with sustainability, we need to provide firms with a framework within which to conceptualize their engagement with sustainability, and we need to provide examples of the capabilities and resources that can support such an endeavor (Rohrbeck et al. 2013).

Linked legitimacy and overlapping ecosystems identifies an innovative (Chesbrough, 2010) approach to developing SBMs that managers can employ. Firms can identify linked legitimacy in their ecosystems and use it to create and capture value (Chesbrough, 2007; Zott and Amit, 2010; Zott et al., 2011; Foss and Saebi, 2017; Battistella et al. 2017), and to address environmental, economic and social issues (Stubbs and Cocklin 2008, 119; Elkington, 1997; Bansal 2002). However, to benefit from linked legitimacy and build a BM around a logic of sustainability, firms must be able to develop dynamic capabilities to acquire, reconfigure and exploit partnership resources and skills (Teece et al. 1997). This requires that firms identify stakeholders who could participate in a sustainable development project, who may become a source of legitimacy for the firm, and who are interested in exploring complementarities in their respective ecosystems. Further, as firms develop new capabilities around linked legitimacy (financial, technological, reputational), they will also need to identify how to reconfigure linked legitimacy for use in their own ecosystem. In rapidly changing environments, such strategic agility, “the ability to dynamically revise or reinvent the company and its strategy” (Fartash et al, 2012), becomes essential to identify and seize opportunities and innovation (Battistella et al 2017).

6.3 Limitations and implications for further research

A study of how S&P 500 firms actually implement SBMs reveals a tendency to be reactive, rather than proactive, to social trends (Ritala et al. 2018). Additional research into how to facilitate more engagement with SBMs is needed. Linked legitimacy could represent a way to incentivize firms toward being proactive about finding partners with whom to exploit this available resource and could encourage the adoption of SBMs across the ecosystem (Lüdeke-Freund, 2010; Bolton et al, 2016; Boons and Lüdeke-Freund, 2013; Foxon et al., 2015), thus increasing the rate and impact of sustainable development projects. A linked legitimacy approach to SBM development advocates for exploiting value created around sustainably virtuous legitimacy, which creates shared value and collective impact (Kramer and Pfitzer 2016). Research is also needed to identify the mechanisms by which linked legitimacy can be created and exploited in other industries, and how SBMs spread across business ecosystems. For example, what kinds of innovation are most likely if firms envision linked legitimacy as a core driver in their ecosystem development and what are the impacts on value creation across 3BL measures? In addition, are there limits or dark sides to positively-focused opportunistic behavior? For example, does the virtue of the linkage to sustainable development activities and capabilities change or diminish over time? Finally, a better understanding the role of policy makers at the local and national level in the emergence of SBMs (Aarikka-Stenroos and Ritala, 2017) is needed, as is insight into how public actors can help augment linked legitimacy to create conditions for SBM development.

We see in these three cases that linked legitimacy is not equally good for everyone, that some populations do not benefit from the focus of the sustainable project. For example, residents

near ArcelorMittal still suffer from poor air quality. Future research should investigate how more stakeholders could benefit from linked legitimacy, or how to expand the reach of SBM impact. Could an industrial matchmaker system (Zaoual and Lecocq, 2018) advocate for vulnerable populations while growing SBMs with linked legitimacy? In another vein, the Dumont case highlights the need for more research on the interactions between linked legitimacy and the marketplace. For example, we posit that linked legitimacy needs marketplace exchanges to cross ecosystem boundaries and grow SBM; are there cases when market exchanges are not necessary to facilitate that? Further, there are cases where the SBM must be built in different ways, for example when an industry or network must come together to push major changes (e.g. Matinheikki et al. 2017). Finally, we encourage an exploration of the boundaries of our conceptualization of SBM development.

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Appendix

Table 1. Overview of cases and data sources

	Case: Gecco
Primary data	<p>Number of respondents: 11 employees/stakeholders</p> <ul style="list-style-type: none"> Company founder and owner (interviews and three informal meetings at meetings of the Alliance association, CERDD and Club Noé)

	<ul style="list-style-type: none"> • Project manager at Gecco • Restaurant holder: Canard Street • Restaurant holder : Chantecler • Employee of the APES following the launch of Gecco • Manager Marketing Food Service France chez McCain • CEO of the social business « Bon et Bien » • El municipal council of the city of Lille in charge of energy policy • Projet Manager at CERDD • Coordinator of the AVNIR platform at Cd2E • Municipal council of the city of Lille in charge of international and European cooperation
Secondary data	<ul style="list-style-type: none"> • Company website • Follow-up of the company's actions and events on the social network facebook • Review of articles devoted to the company since October 2016 • Activity reports, Gecco's report to the eco-design contest on life cycle analysis
	Case : ArcelorMital
Primary data	<p>Number of respondents: 9 employees/stakeholders</p> <ul style="list-style-type: none"> • Director of Sustainable development • Director DK6 • Ecopal manager • Project manager of Dunkerque Chamber of Commerce and Industry • Project Manager Opal'air • Director Project Ecological and social transition of the city of Grande Synthe • Representative of ADEME • Territorial manager Gaz de France • Project leader at the urban community of Dunkerque
Secondary data	<ul style="list-style-type: none"> • Company website • Review of articles devoted to the company since March 2014 • Review of the environmental authority on the DK6 project • Public investigation into the operation of DK6 • Proceedings of meetings of the SPPPI • Synthesis of the 2017 Great Synthe Transition Forum • Gaz de France press kit • Final report: le territoire entrepreneurial durable. Le cas de Dunkerque (Nord de France) sous la direction de Sophie Boutillier, Blandine Laperche et Dimitri Uzunidis, Réseau de recherche pour l'innovation, janvier 2015
	Case : Dumont

Primary data	<p>Number of respondents: 8 employees/stakeholders</p> <ul style="list-style-type: none"> • CEO • Human resource manager Dumont • Heating engineer/Repair employee • Co-manager of Delecroix Carpentry • Two members of the Noé corporate club (specialized in the economy of functionality) • General delegate of Club Noé • Head of the business club "territory startup" • Informal meetings with heads of companies participating in the group Living in the Noah Club
Secondary data	<ul style="list-style-type: none"> • Company website • Review of articles devoted to the company since October 2016 • Noé Club Activity Report (Economics of functionality) • Summaries of the Plenary meetings of the Club Noé of the Hauts-de-France Region since August 2013 • Summary of Club Economics meetings of the Paris feature on the economics of housing functionality
	<p>Participant observation</p>
	<p>Participant observation since 2014 in the various business networks where the CEOs of the three cases studied were active members; regular participation in organized meetings:</p> <ul style="list-style-type: none"> • by the Noé company club Club on the economy of functionality), • by the CERDD (Resource Center for Sustainable Development), • by the city of Grande Synthe as part of the Transition Forum, <p>by the Orée association within the framework of the COMETHE project on the on the approaches of industrial ecology</p>