

The Engagement of Firms in Environmental Collaborations: Existing Contributions and Future Directions

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Ulrich Wassmer¹, Raymond Paquin²,
and Sanjay Sharma³

Abstract

The engagement of firms in environmental collaborations has become a ubiquitous phenomenon in today's business landscape. Yet much of the research to date is fragmented across multiple disciplines and lacks a clear framework to support future study. The authors consolidate and synthesize existing contributions into a conceptual map comprised of antecedents, consequences, and contingencies to better understand environmental collaborations. This map offers a perspective on how firms develop strategies, structures, and capabilities to manage and balance environmental and economic performance and increasing demands for environmental sustainability from multiple stakeholders and society. The authors then highlight existing gaps in the extant literature and outline a future research agenda, including key questions and issues needing additional study.

Keywords

environmental sustainability, environmental collaborations, natural environment, research agenda

¹EMLYON Business School, Ecully cedex, France

²Concordia University, Montréal, QC, Canada

³University of Vermont, Burlington, VT, USA

Corresponding Author:

Ulrich Wassmer, EMLYON Business School, Strategy and Organization Department, CS 40203,
23 Avenue Guy de Collongue, 69134 Ecully cedex, France.
Email: wassmer@em-lyon.com

Since the 1992 United Nations Conference on Environment and Development (*Rio Earth Summit*) and the 2002 World Summit on Sustainable Development (*Johannesburg Earth Summit*) environmental sustainability has become a prominent concern for private, public, and civil society sector actors. As a consequence, firms have increasingly sought out environmental¹ collaborations (*ECs*) as a way to exploit opportunities and neutralize threats related to environmental issues.

Scholarly interest in *ECs* has grown tremendously in recent years, yet the research landscape remains fragmented, making it difficult to synthesize and evaluate the cumulative impact of this work. This fragmentation likely stems from the fact that researchers from a broad range of domains such as strategy, organizational theory, entrepreneurship, marketing, public policy and administration, operations management, and industrial ecology have tackled domain-specific *EC* research issues using only the specific theories and methods dominant in their respective domains. Moreover, recent review efforts in research areas important to the understanding of *ECs* have not painted a clear picture of existing contributions, current debates, and future research opportunities concerning the *EC* phenomenon. For example, Kale and Singh's (2009) review on strategic alliances identifies some future research challenges but does not include alliances with an environmental scope. Selsky and Parker's (2005) review offers insight into cross-sector social partnerships but provides little on partnerships with an environmental scope. Meanwhile, Etzion's (2007) review on organizations and the natural environment contributes to the strategy and organizational theory literatures but largely ignores the role of *ECs* within these domains. Likewise, review efforts on firm-government collaborations remained silent on the *EC* phenomenon (Hodge & Greve, 2007; Schaeffer & Loveridge, 2002).

The fact that the number of scholarly publications on *ECs* has increased in recent years suggests that the time is ripe to reflect on and integrate existing contributions and develop some directions for future research. Thus, the purpose of this article is to (a) identify, review, and organize key conceptual and empirical findings from *EC* research, and (b) establish a research agenda by identifying key research issues and questions in areas where further research is required. This study contributes to the literature on interorganizational collaboration and environmental sustainability in at least two ways. First, we develop a cohesive foundation and conceptual map for understanding *ECs*. This foundation and mapping helps further our understanding of how firms develop strategies, structures, and capabilities to manage environmental and economic performance to accommodate increasing stakeholder and societal

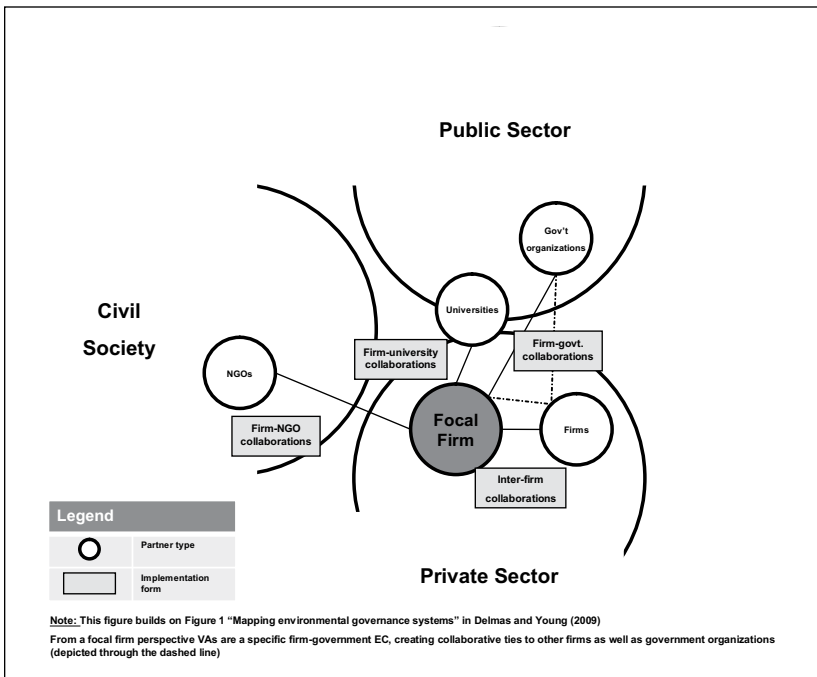


Figure 1. EC implementation forms.

demands on environmental issues. Second, we suggest a future research agenda that includes some key issues and questions for the *EC* domain.

For this study, we define *ECs* as arrangements between a firm and one or more other organizations with the goal of reducing negative or generating positive environmental impact in domains such as climate change, energy and resource efficiency, forestry renewal, clean water, reducing desertification, and natural resource depletion (Arts, 2002; Clark & Woodrow, 2007; Crane, 1998; Dutton, 1996; Glasbergen & Groenenberg, 2001; Gotschall, 1996; Hartman, Hofman, & Stafford, 1999; Hartman & Stafford, 1998; Mendleson & Polonsky, 1995; Steger, Ionescu-Somers, Salzmänn, & Mansourian, 2009). As we are applying a firm-focused perspective, our efforts address the four dominant interorganizational collaboration forms through which firms implement *ECs*: (1) interfirm collaborations, (2) firm-NGO collaborations, (3) firm-government collaborations, and (4) firm-university collaborations. Figure 1 depicts these four *EC* implementation forms and the boundaries of this review.

The remainder of this article is structured into four primary sections. First, we review the four dominant *EC* implementation form attributes identified above. In the second section, we describe the methods used in conducting our extensive survey, review, and literature categorization. We close this section by introducing the conceptual map used to organize this literature. Next, we review and map scholarly findings concerning the antecedents, consequences, and contingencies related to *ECs* and highlight how they apply to the four *EC* implementation forms. The article concludes by identifying and discussing future research opportunities.

EC Implementation Forms

ECs often form in response to increasing political, economic, and social forces demanding environmental action (Austin, 2000; Delmas & Montes-Sancho, 2010; Hartman & Stafford, 1997; Long & Arnold, 1995). From a firm-level perspective, *ECs* represent a melding of market, nonmarket², and environmental strategies and occur through four dominant interorganizational collaboration types³: (1) interfirm collaborations, (2) firm-NGO collaborations, (3) firm-government collaborations, and (4) firm-university collaborations. Table 1 summarizes their key attributes.

Interfirm ECs

Interfirm collaborations are voluntary collaborations between two or more firms involving the exchange, sharing, or codeveloping of resources and capabilities as part of a project or business operation (Dussauge, Garrette, & Mitchell, 2000; Gulati, 1999). Their main objective tends to be economic value creation through jointly exploiting opportunities and/or neutralizing threats in the market environment (Chan, Kensinger, Keown, & Martin, 1997; Hagedoorn & Schakenraad, 1994). However, firms increasingly implement *EC*-type interfirm collaborations to combine economic and environmental objectives (Ammenberg & Hjelm, 2003; Amundsen, 2000; Andersen & Lund, 2007; Glasbergen & Groenenberg, 2001; McEvily & Marcus, 2005), involving suppliers (Crane, 1998; Vachon & Klassen, 2006), customers (Vachon & Klassen, 2006), and competitors (Crane, 1998). Alliances that develop more environmentally sustainable products fall into this category; they seek to create economic value by exploiting new market opportunities while simultaneously seeking to generate positive environmental impacts. The General Motors-Dow Chemical partnership to jointly develop commercial hydrogen fuel cells for power generation provides one

Table 1. Attributes of EC Implementation Forms.

Attributes	Interfirm ECs	Firm-NGO ECs	Firm-government ECs	Firm-university ECs
Types of participating actors	Firms	Firms and NGOs	Firms and government organizations	Firms and universities/research centers
Primary objective/s	Economic	Environmental and economic	Political but to some extent also economic	Economic
Main use	Exploit economic opportunities surrounding natural environment related issues, for example, the need for greener products	Improve firm's reputation	Preempt regulatory threats and shape potential future regulations	Exploit economic opportunities, for example, need for greener products, by bridging the gap between research base and market
Types of benefits sought by the partners	Private benefits, that is, benefits accruing to the firms	Private and public benefits	Private and public benefits	Private benefits, that is, benefits accruing to firms and the university partner
Exemplary studies	Codevelop new environmental products and processes (Glasbergen & Groeneberg, 2001; Hartman & Stafford, 1997) Implement economically feasible environmental systems (Hartman & Stafford, 1997; von Malmborg, 2003)	Firm license of NGO name (Hartman & Stafford, 1997; Mendelson & Polonksy, 1995) Corporate sponsorship of NGO project/s (Hartman & Stafford, 1997; Mendelson & Polonksy, 1995) NGO endorsement of firm's	Public policy alliances (Hartman & Stafford, 1997) Advocacy of new legislation (Steger et al., 2009) Public involvement in management of internal environmental practices (Glasbergen & Groeneberg, 2001)	Research projects (Glasbergen & Groeneberg, 2001; Steward & Conway, 1998)

(continued)

Table 1. (continued)

Attributes	Interfirm ECs	Firm-NGO ECs	Firm-government ECs	Firm-university ECs
	Develop new businesses focusing on new technologies, products or services, and market domains (Steger, Ionescu-Somers, Salzmann, & Mansourian, 2009)	product/s (Hartman & Stafford, 1997; Mendelson & Polonsky, 1995)	Develop a certifiable standard (Steger et al., 2009)	
	Develop, test, and apply best practices (Steger et al., 2009)	Conflict resolution round tables (Glasbergen & Groeneberg, 2001)		

example (Daily, 2004). Although such a positive environmental impact provides public benefits⁴ (i.e., reduced carbon emission), traditional interfirm alliance research has focused mainly on the common and private benefits accruing to alliance partners (Khanna, Gulati, & Nohria, 1998) with much less attention paid to the potential public benefits. We return to this point in our discussion of future research. To conclude, *ECs* implemented through interfirm collaborations can be seen as vehicles to realize economic value through addressing environmental problems.

Firm-NGO ECs

Firm-NGO collaborations are voluntary, formal, and informal collaborative arrangements between firms and NGOs concerning a broad range of social and environmental issues (Austin, 2000; Berger, Cunningham, & Drumwright, 2004, 2006; Le Ber & Branzei, 2010; Rivera-Santos & Rufin, 2010; Sagawa & Segal, 2000; Seitanidi & Crane, 2009; Selsky & Parker, 2005) and may be considered a subset of cross-sector partnerships more broadly (Gray, 2000; Selsky & Parker, 2005). The objectives of firm-NGO collaborations often involve social, environmental, and economic value creation with private economic benefits accruing to partners and public benefits accruing to actors that are beyond traditional organizational boundaries (Waddock, 1988).

Similar to the muddling of CSR and sustainability in the literature (May, Cheney, & Roper, 2007; Sharma & Ruud, 2003), firm-NGO collaboration research tends to view social and environmental collaborations as somewhat the same (Austin, 2000; Berger et al., 2004, 2006; Le Ber & Branzei, 2010). Yet we found a lot of firm-NGO collaboration work with an environmental scope (e.g., Ählström & Sjöström, 2005; Arts, 2002; Arya & Salk, 2006; Austin, 2003; Crane, 1998; Dutton, 1996; Glasbergen & Groenenberg, 2001; Gunningham, 2001; Hartman & Stafford, 1998; King, 2007; Livesey, 1999; Rondinelli & London, 2003; Stafford & Hartman, 1996). Our review distinguishes this work clearly from work on social collaborations⁵ more broadly. Examples of firm-NGO *ECs* include firms licensing NGOs' names, sponsorships of NGOs' work and/or specific projects, and NGO endorsements of firms' products (Hartman & Stafford, 1997; Mendelson & Polonksy, 1995). In summary, firm-NGO *ECs* can be seen as vehicles to create economic and broader societal value by addressing environmental issues.

Firm-Government *ECs*

Building on Delmas and Toffel (2008, pp. 1034-35) we view firm-government *ECs* as voluntary "... collaborative arrangements between firms and regulators whereby firms voluntarily commit to actions that might improve their environmental performance (Delmas & Terlaak, 2001). These programs are designed by policy makers to associate private benefits with the voluntary provision of public goods (Delmas and Terlaak, 2001)." Firms engage in collaborations with government organizations for a number of reasons, including signaling positive environmental behavior to stakeholders, reducing regulatory pressures, and learning new skills. For firms, these *ECs* fall into the domain of nonmarket and political strategy (Baron, 1995; Bonardi & Keim, 2005); their scope ranges from preempting regulatory threats to shaping future regulations (Delmas & Marcus, 2004; Delmas & Terlaak, 2001).⁶ Such collaborations frequently aim to influence government policy and norms through proactive collective political action (Delmas & Montes-Sancho, 2010; Oliver & Holzinger, 2008). Firm-government *ECs* tend to be an effective approach when certain environmental issues challenge firm boundaries (Delmas & Terlaak, 2001). Research has found that firm-government *ECs* occur both at regional (Ammenberg & Hjelm, 2003; von Malmborg, 2004) and industry levels (Amundsen, 2000). Often firm-government *ECs* occur as multipartner alliances, and participating firms demonstrate three different types of behaviors: noncooperation and free riding (Delmas &

Keller, 2005), symbolic cooperation, and substantial cooperation (Delmas & Montes-Sancho, 2010). Government actors participate in these *ECs* as a way to build environmental capabilities and strengthen regional interfirm environmental networks or clusters (von Malmborg, 2003, 2004). Local authorities, in particular, can play critical supporting roles for interfirm learning and knowledge transfer and becoming knowledge repositories that firms can leverage to improve their own actions over time (Gombault & Versteeg, 1999; von Malmborg, 2003, 2004, 2007).

Firm-University ECs

Firm-university collaborations are agreements between firms and university-based research organizations (public or private) focused on collaborative R&D, university-provided contract research and consulting, development and commercialization of technology through a firm owned partly by the academic inventor, employee training, and/or transfer of university-generated intellectual property to firms (Agrawal, 2001; Perkmann & Walsh, 2007). Increasingly, firms collaborate with universities to address environmental issues and foster green innovations. One example is the 2008 BP-University of California, Berkeley alliance to develop renewable energy solutions (www.dailycal.org). The BP-UC Berkeley example demonstrates that firm-university *ECs* are similar in nature to interfirm *ECs* except that one partner comes from the higher education sector.

Method

This review follows a method similar to other recent reviews (Kourula & Laasonen, 2010; Wassmer, 2010). First, we performed an extensive search of peer-reviewed journals in management, marketing, public policy, political science, economics, finance, sociology, operations, environmental sciences, and industrial ecology, using prominent research databases (EBSCO Academic Search Premier, the JSTOR Arts and Science Collection, and ABI/INFORM on ProQuest) and journal websites.

We searched the period from 1989 to present, beginning 3 years prior to the 1992 Rio Earth Summit, when broad-based interest in *ECs* was first generated (Glasbergen, Biermann, & Mol, 2007). This time frame also captures research generated from public and academic events such as the 1998 Greening of Industry Network (GIN) conference with the theme “Partnership

and Leadership: Building Alliances for a Sustainable Future” (Hartman et al., 1999) and subsequent UN-sponsored environmental conferences and special journal issues and academic conferences related to *ECs*, for example 1999 and 2005 *Business Strategy and the Environment*’s special issues on partnerships around sustainable development (Hartman et al., 1999; Young, 2005) and the 1995 *Academy of Management Review* and 2000 *Academy of Management Journal* special issues on organizations and the natural environment (Starik & Marcus, 2000).

To search for individual articles, we developed a two-dimensional search matrix combining collaboration and sustainability-related search terms. We supplemented this search matrix with additional individual journal website searches for in-press articles. We refined our list of potential articles by culling those with titles and abstracts relevant to this review. When the title and abstract proved inconclusive, we read the articles in more detail to determine their relevance. Next, we searched the reference sections of key articles to identify additional sources, such as books and other articles, not found in our original article search. We read and summarized the selected articles highlighting key characteristics such as study type (i.e., theoretical or empirical, practitioner or scholarly), research issue/s and question/s, theoretical underpinnings, research design, variables, empirical setting, findings, and implications. We categorized each study using keywords and concepts, which helped identify emerging research issues and themes in the literature. Given our firm-focused perspective on *ECs*, we excluded studies focused primarily on NGO-governmental collaborations (e.g., Selsky & Parker, 2005; Sinh, 2002) and community-level collaborations aimed at formulating and implementing policy change (e.g., Hills & Man, 1998; Regeczi, 2005). Based on our reading of these articles, we found the categories antecedents, consequences, and contingencies of *ECs* provided a parsimonious conceptual map, depicted in Figure 2, to view this diverse literature.

EC-Relevant Antecedents, Consequences, and Contingencies

EC-Relevant Antecedents

Our analysis of the extant literature revealed that antecedents relevant to *ECs* can be understood best at three levels of analysis: (1) the focal firm level, (2) the interorganizational level, and (3) the external environment level.

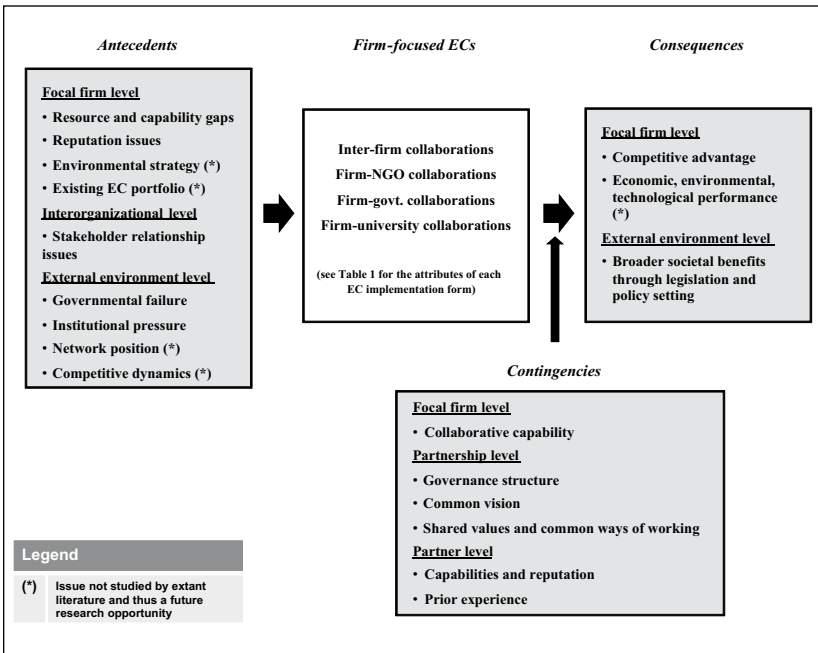


Figure 2. Conceptual map for understanding ECs.

Focal Firm–Level Antecedents

A key focal firm–level antecedent for all four *EC* implementation forms can be classified as “resource and capability gaps.” As no one firm possesses all the necessary resources to exploit every opportunity and neutralize every threat in its external environment, firms frequently use nontraditional market mechanisms such as interorganizational collaborations to obtain preferential access to resources they do not possess (Gulati, 2007). The extant literature shows that firms often seek out *ECs* to access resources and capabilities required to green their operations and business practices (Glasbergen & Groenenberg, 2001; Gotschall, 1996; Perez-Aleman & Sandilands, 2008; Rondinelli & London, 2003; Roy & Whelan, 1992; Sarkis, 2003; Vachon & Klassen, 2006; Vermeulen & Ras, 2006), identify and exploit market opportunities (Arts, 2002; Hartman & Stafford, 1998; Mendelson & Polonsky, 1995; Rangan, Samii, & Van Wassenhove, 2006; Rondinelli & London, 2003; Stafford, Polonsky, & Hartman, 2000), develop a greener marketing mix

(Crane, 1998; Glasbergen & Groenenberg, 2001; Mendelson & Polonsky, 1995; Polonsky & Rosenberger, 2001), develop solutions to their environmental problems (Fischer & Schot, 1993; Tombs, 1993), develop contingencies for environmental disasters (Stafford & Hartman, 1996), and formulate more proactive and sustainable strategies and business models (Hart & Sharma, 2004; Hartman & Stafford, 1998; Livesey, 1999; London & Hart, 2004).

More specifically, firms tend to engage in firm-NGO *ECs* (Clarke & Roome, 1999; Crane, 1998; Hartman & Stafford, 1997, 1998; Rondinelli & London, 2003; Steger et al., 2009) and firm-government *ECs* (Delmas & Marcus, 2004; Delmas & Montes-Sancho, 2010; Delmas & Terlaak, 2001; Helby, 2002; Videras & Alberini, 2000) when seeking to access critical network resources required to tackle the opportunities and threats described above. For firm-NGO collaborations, access to complementary resources is an especially important determinant, as firms often provide tangible rent-generating resources in exchange for NGOs' intangible resources such as specialized environmental expertise, awareness of social forces, reputation and legitimacy, and access to distinct networks (Arts, 2002; Hartman & Stafford, 1998; Yaziji, 2004). Interestingly, the extant literature reveals that firms use firm-NGO *ECs* not only for addressing specific environmental problems (Crane, 1998; Fischer & Schot, 1993; Steger et al., 2009; Tombs, 1993) but also to become more responsible overall (Arya & Salk, 2006; London, Rondinelli, & O'Neill, 2005). Although research evidence is limited, it appears that firms use firm-university *ECs* specifically to bridge the gap between the research base and the market in order to develop green product innovations (Steward & Conway, 1998).

Another key focal firm-level antecedent can be classified as "reputation issues." Here, the literature shows that firms engage in firm-NGO *ECs* and to a lesser extent, firm-government *ECs* (Videras & Alberini, 2000) as a way to improve their reputations. More specifically, the extant literature indicates that firm-NGO *ECs* where NGOs serve as champions for firms' environmental actions (Hartman & Stafford, 1998) allow firms to gain (or regain) public trust and improve their reputations around environmental matters (Arts, 2002; Crane, 1998; Griesse, 2007; Hartman & Stafford, 1997; LaFrance & Lehmann, 2005). For example, Stafford and colleagues (2000) analyzed the Foron-Greenpeace *EC* finding that such collaborations can help firms to create consumer credibility through product endorsement by a powerful NGO. Although firm-NGO *ECs* tend to involve a substantial resource exchange, firms also use them strategically as rhetorical mechanisms in an environmental discourse to gain reputational benefits (Livesey, 1999).

Interorganizational-Level Antecedents

A desire for managing “stakeholder relationship issues” is a key antecedent for firm-NGO *ECs* as firms seek to develop and strengthen stakeholder relationships through mitigating conflict and addressing stakeholder concerns (Clarke & Roome, 1999; Rondinelli & London, 2003; Stafford et al., 2000; Steger et al., 2009; Wesley & Vredenburg, 1991). Firm-NGO *ECs* seem to play a particularly important role in helping firms improve their standing with environmental NGOs, preempt potential attacks, and build strategic bridges to other societal stakeholder groups (Arts, 2002; Dutton, 1996; Livesey, 1999; Stafford & Hartman, 1996). For example, firm-NGO *ECs* can be used to align different stakeholder groups to drive the adoption of an environmentally friendly technology (Stafford et al., 2000). However, such collaborations do not guarantee success as they can be thwarted by individual concerns of trust, loss of control, and misinterpretation of partners’ motivations and intentions (Long & Arnold, 1995). The level of conflict that exists between firm-NGO *ECs* partners prior to the collaboration is also an important factor. In fact, many *ECs* emerge to address prior conflict and deepen the dialogue between partners as well as to incorporate other stakeholders into the decision-making processes (Arts, 2002; Dutton, 1996).

External Environment–Level Antecedents

With the growing importance of the environmental sustainability discourse (Livesey, 1999), public and civil society actors have pressured firms increasingly toward self-governance (Arts, 2002; Hartman et al., 1999; Starik & Heuer, 2002). Increasing NGO engagement around policy formulation and implementation may have also contributed to the increased external pressure on firms (Hendry, 2003; Hoffman & Bertels, 2010; Starik & Heuer, 2002).

At the external environment level of analysis, two key antecedents exist: government failure and institutional pressures. Firm-government *ECs* are one response to overcoming previously failed interventions by governments and multilateral institutions in developing meaningful regulations (Andonova, 2010; Bäckstrand, 2006; Glasbergen & Groenenberg, 2001; Kolk, van Tulder, & Kostwinder, 2008; Steger et al., 2009). Such *ECs* develop “a specific type of private environmental policy arrangement” (Arts, 2002, p. 30) to address particular situations. In other words, firms come together to create self-regulation in the absence of existing formal government or multilateral action.

“Institutional pressures” include pressure from a variety of sources, including NGOs, stakeholders, governments, and industry (Arya & Salk, 2006; Harrison, 1995; Sharma & Vredenburg, 1998). Firms use *ECs* to address environmental issues proactively before government-imposed threats can be made or carried out (Delmas & Montes-Sancho, 2010; Hartman & Stafford, 1998) or competitive pressure from industry peers weaken their market position (Delmas & Montes-Sancho, 2010). Firms may also use *ECs* reactively as a defense against such regulatory threats (Stafford & Hartman, 1996; Stafford et al., 2000). Firm-government *ECs* are a dominant implementation form in these instances because of their effectiveness in influencing and/or preempting impending regulations (Christmann & Taylor, 2006; Hartman & Stafford, 1998; Howard-Grenville, 2002; King, Lenox, & Terlaak, 2005; Stafford & Hartman, 1996) and shaping potential future environmental regulations (Delmas & Marcus, 2004; Delmas & Terlaak, 2001).

EC-Relevant Consequences

Consequences of *ECs* can be best understood by classifying them at the level of the focal firm and the external environment. While *ECs*, by definition, seek to develop environmental benefits, research reveals that they also generate economic and political benefits.

Focal Firm–Level Consequences

The key focal firm–level consequence for all four *EC* implementation forms is the potential to create some level of “competitive advantage.” Competitive advantage results from decreasing costs through efficiency improvements and/or increasing revenues from new products and markets (Hartman & Stafford, 1997; Rondinelli & London, 2003; Sharma & Vredenburg, 1998; Yaziji, 2004), through jointly developed and operated environmental systems and technologies (Ammenbergh & Hjelm, 2003; Stafford et al., 2000), greener supply chain practices (Perez-Aleman & Sandilands, 2008; Vachon & Klassen, 2006; Zhu & Cote, 2004), compliance with industry and/or international environmental standards, training on energy efficient procurement (Helby, 2002; McEvily & Marcus, 2005), increased internal information sharing (Amundsen, 2000; Mendelson & Polonksy, 1995), changes in human resource management (Austin, 2000), and broader structural and technological changes (Helby, 2002). However, this work also shows *ECs* can have potentially negative consequences when set up and managed poorly and may

even destroy firm value (Westley & Vredenburg, 1991). Thus, firms should consider possible negative impacts while forming and managing *ECs*. We return to this point in the contingencies section below.

For small- and medium-size enterprises (SMEs), in particular, research shows that *ECs* can enhance competitiveness, environmental reputation, and credibility (Mendelson & Polonksy, 1995; Stafford et al., 2000) by increasing reach and access in the marketplace (Gombault & Versteeg, 1999; Gunningham & Sinclair, 2002) and better engaging and educating consumers through product and organizational endorsements. For example, through interfirm *ECs*, small and medium sized combined heat and power plants competed more effectively in regulated energy markets by offering services through their *ECs* similar to those that their larger competitors offered on their own (Andersen & Lund, 2007).

Moreover, firm-government *ECs* can help firms enhance environmental performance and reputation through improved operational efficiency. The potential benefits include increased flexibility in dealing with existing and deterring future regulations, enhanced learning around developing solutions to their environmental problems, and improved public recognition and goodwill (Arora & Gangopadhyay, 1995; Delmas & Terlaak, 2001). Still, research shows free riding can be a problem, as firms not involved or only symbolically involved may nevertheless benefit from the overall improved industry reputation from particular collaborations (Delmas & Montes-Sancho, 2010; Delmas & Terlaak, 2001).

External Environment–Level Consequences

ECs, particularly firm-NGO or firm-government *ECs*, can also create “broader societal benefits” (Amundsen, 2000; Sharma, Vredenburg, & Westley, 1994) by influencing environmental legislation and policy making (Gulbrandsen & Andresen, 2004; Koontz et al., 2004). Examples include industry-level and international standards and certifications and the adoption of new practices and technologies (Yaziji, 2004). This approach may occur through setting, adopting, and enforcing agreed-upon practices and standards within an industry (e.g., Responsible Care adopted by the chemical industry) or at a broader level (e.g., ISO certifications or Global Reporting Initiative; Arya & Salk, 2006). Research shows that larger-scale *ECs*, especially implemented as firm-government *ECs*, can potentially have regional-level impacts, serving as a marketing tool for attracting new investments among environmentally responsible firms (Amundsen, 2000; von Malmborg, 2004).

EC-Relevant Contingencies

The extant literature has identified focal firm-level, partnership-level, and partner-level contingencies that influence the consequences of *ECs*.

Focal Firm-Level Contingencies

A firm's "collaborative capability" is the key success factor for *ECs*, irrespective of the implementation form (Austin, 2003; Dyer, Kale, & Singh, 2001). This capability includes a firm's ability to adequately screen, assess, and select partners (Dyer et al., 2001; Gray, 1985; Gray & Wood, 1991) in light of supporting an *EC's* particular objectives (Mendelson & Polonsky, 1995). Among the aspects of *collaborative capacity* that firms need to consider are whether potential partners have the requisite resources and credibility to support the *EC* (Hendry, 2003; King, 2007; Rangan et al., 2006) and have established or can establish and maintain common values and approaches for collaborating effectively (Glasbergen & Groenenberg, 2001; Rondinelli & London, 2003).

More important, collaborative capability in the *EC* context differs from what more traditional interfirm collaboration literature discusses as alliance capability (Kale, Dyer, & Singh, 2002), and their success relies on a different treatment and approach (Rondinelli & London, 2003). In particular, firms need to engage and manage their *ECs* and *EC* partners beyond the confines of traditional interfirm collaborations (Austin, 2003), supporting the likely more diverse types of *EC* partners involved in ways that leverage prior experience to support new collaborations (Rondinelli & London, 2003; von Malmborg, 2003). For technically oriented *ECs* this collaboration might require leveraging specialized expertise or infrastructure, as demonstrated by *ECs* between small- and medium-sized combined heat and power plants (Andersen & Lund, 2007).

Partnership-Level Contingencies

At the *EC* partnership level a number of important factors influence the outcomes of *ECs*. First, the "governance structure" is essential to *EC* success (King, 2007; Rangan et al., 2006). Governance of *ECs* runs a continuum from more informal knowledge-sharing arrangements on particular environmental issues (Arts, 2002; Glasbergen & Groeneberg, 2001; Milne, Easwar, & Gooding-Williams, 1996) to formalized joint R&D and product development (e.g., Greenpeace and Foron *EC*, Stafford et al., 2000). In particular, firm-NGO

ECs appear to have relatively high levels of formalization (Milne et al., 1996), perhaps due to the longer-term perspectives of these partnerships, and/or that firm-NGO *ECs* often develop into more in-depth relationships over time (King, 2007; Vachon & Klassen, 2006).

“Common vision” and “shared values and common ways of working” are also important determinants for *EC* success, particularly among firm-NGO, firm-government, and firm-university *ECs*. Partners’ ability to balance their varied goals and motivations due to their different backgrounds (including different economic, environmental, and political goals) is critical for *EC* success (Crane, 1998; Hartman & Stafford, 1997, 1998; Polonsky & Rosenberger, 2001). An obvious though often difficult aspect involves balancing firms’ profit-seeking motives with more environmentally focused motives of partners from other sectors (Hartman & Stafford, 1997, 1998). Von Malmberg (2004) provides an example of such goal diversity in his work on local authorities in Sweden, where public actors sought environmental value creation mainly and private actors sought economic value creation. Success here may mean *EC* partners become intentionally inclusive to better understand the goals and motives involved in an *EC*. As Newig and Fritsch (2009) found with firm-government *ECs*, greater inclusiveness of actors from within governmental agencies tended to improve the quality of environmental policy outcomes developed from *ECs*. Failing to overcome such conflicting objectives may doom *ECs*, particularly firm-NGO or firm-government *ECs* (Westley & Vredenburg, 1991). However, actively managing and overcoming these conflicting (and sometimes adversarial) viewpoints can also help avert failure of an *EC* and support developing more in-depth future collaborations (Hartman & Stafford, 1998; Rondinelli & London, 2003). From a different perspective, among interfirm or firm-NGO *ECs* collaborating with partners of similar size may reduce resource and power asymmetries that might otherwise destabilize an *EC* (Arts, 2002).

It is also important that *EC* partners are willing to accept input and advice from one another when developing and managing *ECs* (Dutton, 1996; Glasbergen & Groenenberg, 2001; Rondinelli & London, 2003). Doing so likely helps align an *EC*’s objectives among partnering organizations and may be necessary in several areas, including developing a collaboration’s market positioning (Hartman & Stafford, 1997), transparent and defensible environmental objectives (Stafford & Hartman, 1996), agreed-upon rhetorical justifications (Livesey, 1999), and result-oriented focus around specific “win-win” outcomes (Glasbergen & Groenenberg, 2001; Hartman & Stafford, 1998). For *ECs* implemented through firm-NGO collaborations in particular, it is necessary to develop agreeable means to compensate NGO partners for

their contributions (Pratt, 2001). As successful *ECs* tend to evolve and deepen over time, partners need to ensure continued open communication and partner independence to ensure continued success (Glasbergen & Groenenberg, 2001; Stafford & Hartman, 1996).

The above insights come primarily from studies on dyadic firm-NGO *ECs*, though these points likely hold for multipartner *ECs* as well. Although less work exists on multipartner *ECs*, we found ideas similar to those discussed above in terms of input legitimacy (i.e., balanced representation of various stakeholders, accountability, and transparency within the partnership) and output legitimacy (i.e., ways of measuring a partnership's attainment of its goals and targets; Bäckstrand, 2006). This work also suggests that leveraging existing institutional, industry-level, and/or other multilateral agreements linked to established measurable targets, such as industry or international certifications and outcomes, enhances success. Doing so likely supports more effective leadership, improved accountability and a more systematic review, and reporting and monitoring of outcomes (Bäckstrand, 2006).

Partner-Level Contingencies

The bulk of the extant literature on this subject has focused on firm-NGO *ECs* with partners' (usually NGOs) "capabilities and reputation" and "prior experience" in the partnering firm's domain of interest, which is particularly critical for an *EC's* success (Glasbergen & Groenenberg, 2001; Hartman & Stafford, 1997; Mendelson & Polonksy, 1995). In these situations, successful NGOs engage as liaisons or bridging organizations among collaborating partners by clearly articulating the collaboration's vision to all parties, balancing its own needs and interests with those of the involved partners and other stakeholders, and having internal support and capability to manage partner relationships and cope with threats to the partnership itself (Sharma et al., 1994; Stafford et al., 2000; Westley & Vredenburg, 1991).

Directions for Future Research

Having reviewed the literature on *ECs* from 1989 forward, we draw two general conclusions about the state of this research. First, firm-NGO and firm-government *ECs* have received the most attention. Consequently, future research should broaden its focus to other *EC* forms. Specifically, little work has been done on interfirm *ECs* or firm-university *ECs*, despite the relatively large and diverse literatures (albeit not focused on environmental alliances) in both these domains (e.g., George, Zahra, & Wood, 2002; Kale & Singh,

2009). Such a broadened focus would likely contribute to and benefit from exploring *ECs* in more depth. Of particular interest and relevance for these two *EC* forms, and still underexplored, are the public benefits created by them. As stated earlier, interfirm *ECs* or firm-university *ECs* can, besides the private and common benefits that accrue to the partners, create public benefits that accrue to stakeholders beyond organizational boundaries such as civil society (Waddock, 1988). One interesting aspect pertains to how creation of such public benefits affects the governance of these two *EC* forms. Last, research on trisector *ECs* is surprisingly absent and future research should, therefore, examine this particular *EC* form in more detail. Issues of particular interest include the alignment of incentive mechanisms among three partners with different objectives and a comparison of the governance complexity between trisector and more simplistic *EC* forms (Delmas & Young, 2009).

Second, future research needs to become more rigorous theoretically and methodologically to develop greater insight into and connection with other facets of the organizational literature. Most existing work involves descriptive and relatively atheoretical single-case studies and practitioner-oriented research (Bäckstrand, 2006; Crane, 1998; Glasbergen & Groenenberg, 2001; Hartman & Stafford, 1998; Livesey, 1999; Mendleson & Polonsky, 1995; Perez-Aleman & Sandilands, 2008; Steger et al., 2009). Although this approach provides necessary insight into *ECs* as a phenomenon, future research needs to extend this work through more systematic and theoretically grounded research to establish greater generalizability of conclusions. In particular, future work could investigate and extend this work through the lenses of existing management theories, for example, institutional theory, transaction cost economics, resource-based view, or social networks. Because available databases such as SDC platinum contain data focused mainly on market-based interfirm collaborations, press *EC* announcements from sources such as *Factiva*, *Lexus-Nexus*, firms' annual reports, or even managerial surveys seem to be the most promising avenue to gather data and construct proprietary data sets on *ECs* for such studies. Research using large samples will help establish generalizability. Given the wide scope of alliances discussed in this article, survey-based research can be conducted across industries rather than within single industries to address the challenge of obtaining a large "*n*" suitable for reliable statistical analysis. In addition to these general conclusions, we discuss a more detailed agenda for future research below, extending our conceptual map of *EC* antecedents, consequences, and contingencies.

EC-Relevant Antecedents

In our review, we found the extant literature has examined only a relatively small number of antecedents influencing whether and how firms choose to engage in *ECs*. Given this finding, we feel relatively little is still known about what influences firms to enter into an *EC*. Below, we discuss a few relevant possibilities, which are highlighted in Figure 2.

Although it seems obvious that a firm's environmental strategy would influence its engagement in *ECs*, little of what we reviewed studied this relationship explicitly. We know firms engage in a continuum of environmental strategic actions from "proactive" to "reactive" and proactive firms are more likely to engage others to acquire necessary resources and capabilities (Aragón-Correa, 1998; Aragón-Correa & Sharma, 2003; Sharma, 2000). Yet little research explores the role of a firm's environmental strategy in determining "why" and "how" firms engage in *ECs*. Although some support exists for this point (Judge & Douglas, 1998), we found little empirical research investigating this issue in depth. Thus, a promising avenue for future research would be to develop more insight into the link between a firm's environmental strategy, its *EC* behavior, and its overall competitiveness. Specific questions to ask here are as follows: What factors influence the type of *EC* in which firms choose to engage? How do these initial choices influence the types of benefits (value) created through the *EC* and to which actors do these benefits accrue? From a theoretical perspective, the relational view (Dyer & Singh, 1998) and the resource-based view (Barney, 1991; Wernerfelt, 1984) seem well suited to develop new insights. Despite our critique, exploratory case studies would provide insight into developing propositions that could be tested through survey-based research.

Our review showed that the extant literature has researched *ECs* largely as stand-alone transactions instead of viewing them as elements of a collaboration portfolio. Recent work in strategy shows firms engage in multiple simultaneous collaborations with different partners (Wassmer, 2010) and firms' existing collaborations affect the formations of new collaborations and create interdependencies that must be managed together rather than in isolation (Wassmer & Dussauge, 2012). The idea of an *EC* collaboration portfolio, that is, the engagement in multiple simultaneous *ECs* with different partners (Wassmer, 2010), suggests firms with such portfolios are likely to deal with unique trade-offs balancing various *EC* forms across their portfolio (Wassmer & Dussauge, 2011). Yet we found *EC* research largely ignores these broader "portfolio" issues of collaboration. Thus, future work might shed light on

why and how firms build *EC* portfolios, including what may influence the configuration of *EC* portfolios, that is, balancing various *EC* implementation forms, and broader issues around portfolio strategy, composition, and management. Some specific questions worth asking are as follows: What are the performance implications of *EC* portfolios? How are *EC* portfolios constructed and managed? How does managing multiple *ECs* in a portfolio enhance firm's performance and/or ability to meet its environmental strategy objectives? What are the complementarities of managing multiple *ECs* as a portfolio and how can firms manage them for competitive advantages? In this instance, collecting fine-grained data using survey-based research is a promising avenue to pursue, as data from databases may not provide the necessary insights or may be difficult to obtain (as mentioned earlier).

Another finding of our review is that *institutional pressures* primarily drive firms' *EC* engagement. Building on this finding, future work might explore how institutional forces may cause firms to change how and whether they engage in *ECs* over time. Hoffman's (1999) study of the chemical industry, which showed the chemical industry moving from stonewalling to embracing environmental concerns over time, provides a useful foundation for such research. Extending this foundation by taking a field-level view, future work might examine how diverse communities of organizations within and across institutional fields (Scott, 2000) influence the emergence and evolution of *EC* as a legitimate action for firms and actors from other sectors seeking to create environmental benefit. Doing so may in turn provide insight into how *ECs* as a broader interorganizational action form and change over time and how organizational fields themselves may change such collaborative action. Network analysis is the prominent analytical method. Some question to ask are as follows: How does the legitimization of *ECs* over time influence how firms manage their environmental performance and relationships? What impact does the increased prominence of *ECs* among firms have on how they conceive of and manage their environmental actions and strategies?

In a related vein, we know relatively little about how a firm's *network position* (e.g., in its industry, supply chain, regional cluster, with stakeholders) may impact its *EC* behavior or the likely iterative relationship between a firm's *EC* behavior and its network position over time (Paquin & Howard-Grenville, 2012). As well, taking a network perspective may generate greater insight into how stakeholder relationships influence firm *EC* behavior and subsequent outcomes. Given prior work suggesting that *ECs*, once established, often develop into more deeply integrative and impactful collaborations over time (Ehrenfeld & Gertler, 1997; Jacobsen & Anderberg, 2005), it

is likely important to understanding the changing network dynamics that facilitate this deepening of relationships.

More broadly, future research might consider some of the following questions. What is the influence of initial collaboration decisions on an *EC*'s subsequent evolution? How do these decisions influence future *EC* behavior? What is the life cycle of relationships as *EC* partners repeatedly engage with each other or new actors over time? What are the factors enabling and inhibiting the evolution of more integrative relationships over time? In addition, future work can help to understand better how the competitive behavior of rivals, for example, *competitive dynamics* (Gimeno, 2004), may influence a firm's *EC* behavior. Network analysis may help elucidate the interaction of partnering organizations within their broader interorganizational environments. In-depth longitudinal case studies could provide insight into the changing natures of relationships and interactions within an *EC* over time.

EC-Relevant Consequences

A key conclusion of this review is that much of the work exploring the consequences of *ECs* is descriptive, providing little insight beyond identifying broad types of benefits, making it another area in need of attention. Future work could develop some explanatory insight into the relationship between *EC* antecedents, implementation forms, and their outcomes. More rigorous work in this area would be greatly beneficial. One approach may be to extend related work studying linkages with economic performance (Chan et al., 1997; Hagedoorn & Schakenraad, 1994), environmental performance (Russo & Fouts, 1997), innovation and competitive imagination (Hart & Sharma, 2004), and expanding it to include linkages to social performance and other, nonmarket, outcomes such as license to operate (Hart & Sharma, 2004), reputation, and legitimacy. We found little work systematically measuring and analyzing the likely varied *EC* impacts in any great detail. As work in industrial ecology shows, capturing such data is not always straightforward (Chertow & Lombardi, 2005), but it is necessary for the research in this field to progress. Leveraging and extending existing performance frameworks, such as the United Nations' Millennium Development Goals, offer one approach toward more robust systematic measures (Kolk et al., 2008). Last, future work is needed to explore and capture the broader impacts—regional, industrial, and societal—of *ECs* as one way of creating more environmentally responsible organizations across sectors (see Amundsen, 2000; Sharma et al., 1994). Quantitative research designs using large samples seem to be among the most promising avenues. Another avenue to

pursue is survey-based research that includes actors from all sectors: civil society, private sector, and public sector.

EC-Relevant Contingencies

Much of the work we reviewed is practitioner oriented and lacks strong theoretical foundations for hypothesis development and testing. Thus, as a way to continue to develop this literature, we feel future work needs to focus explicitly on developing more rigor around theoretical underpinnings, analyses, and conclusions of *ECs*.

One approach can be to clarify, operationalize, and begin testing the conceptual relationships underlying this work. Doing so might involve creating new or leveraging existing performance measures (e.g., partnership, firm, economic, environmental, political) and would likely support a stronger theoretical foundation for this literature. Moreover, such an approach might leverage related work from interfirm collaborations, cross-sector partnerships, or other literatures to provide insight on particular research designs. In particular, future work might leverage a common approach from the strategy literature to establish a large-sample data set for developing and testing hypotheses from existing case-based work.

Last, at the partnership level, there is considerable interesting work focused on *governance structure* issues (King, 2007; Rangan et al., 2006; Rondinelli & London, 2003; Steger et al., 2009). An opportunity for future work lies in how actors engage each other over time, how governance decisions are revisited and adapted over time, and the impact of such decisions on future *EC* development.

Conclusion

We began this review by noting the importance of *ECs* in today's business landscape. We found interest in *ECs* has become increasingly prominent among practitioners and scholars. Yet this research comes from a variety of domains, building an interesting but fragmented body of literature. To address this condition, we organized the literature on *ECs* along antecedents, consequences, and contingencies, highlighting existing gaps and proposing a number of opportunities for future research. Our organizing framework, shown in Figure 2, represents the key *EC*-relevant antecedents, consequences, and contingencies from the literature as well as areas not yet covered in that literature, which we feel could provide additional insight into the areas we identified. One of the key findings of this study is that although

research interest in this field has grown significantly in recent years, many of the most theoretically and empirically relevant aspects of *ECs* have been addressed only peripherally, if at all. Thus, we feel it is time to build a solid empirical and theoretical foundation for future research, which we have begun to do through this review. We contribute a future research agenda and explore a number of research questions to move this literature forward. In doing so, we have begun to lay a foundation for future *EC* research that allows for the development of additional insights and theoretical extensions.

In conclusion, this review contributes to our conceptual understanding of *ECs* in various ways. First, it identifies and reviews key *EC* research that has accumulated to date. Second, our conceptual map provides a better understanding of *ECs*. Finally, we develop a research agenda with a number of promising avenues for future study. In bridging the literature on organizations and the natural environment with interorganizational collaboration, *ECs* represent an exciting and promising research area rich with opportunity.

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Notes

1. By environment the authors refer throughout to the “natural” environment.
2. Although the market/nonmarket categorization is useful to distinguish different strategy types in a firm, it is less useful to distinguish different collaboration types. For example, interfirm collaborations and firm-university collaborations tend to be market based while firm-NGO collaborations and firm-government collaborations may fall into either category.

3. In their review of the cross-sector social partnership literature, Selsky and Parker (2005, p. 863) identify the so-called “trisector partnerships,” that is, firm-NGO-government collaborations, as one collaboration type. Whereas trisector ECs certainly exist, the authors did not include them in this review because they did not identify any trisector collaboration research that has an environmental scope.
4. The authors thank one of the reviewers for this point.
5. Social collaborations tend to focus on issues such as local economic development, education, health care, human rights, corruption, poverty alleviation, community capacity building, and so on (Kolk et al., 2008; Steger et al., 2009).
6. In the domain of firm-government collaborations, voluntary agreements (VAs) represent a specific collaboration between firms and government organizations. Technically, VAs are two-staged multipartner collaborations involving cooperation among firms in an industry and cooperation between those firms and government (Delmas & Montes-Sancho, 2010). Thus, from a focal firm perspective VAs create collaborative ties to other firms as well as government organizations (Figure 1 depicts these two ties through the dashed lines). VAs with an environmental scope are “. . . collaborative arrangements between firms and regulators in which firms voluntarily commit to actions that improve the natural environment” (Delmas & Terlaak, 2001, p. 44).

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Author Biographies

Ulrich Wassmer (PhD, ESADE) is an associate professor of strategy at EMLYON Business School in France. His research examines the antecedents and consequences of interorganizational collaboration and can be found in *European Management*

Review, Journal of Air Transport Management, Journal of Management, MIT Sloan Management Review, and Strategic Management Journal among others.

Raymond Paquin (DBA, Boston University) is an assistant professor of strategy at the John Molson School of Business, Concordia University and a research associate with the David O'Brien Centre for Sustainable Enterprise. His research focuses on environmental strategy, industrial symbiosis, and environmental collaborations and can be found in *Journal of Industrial Ecology* and *Project Management Journal*.

Sanjay Sharma (PhD, University of Calgary) is the dean of the School of Business Administration, University of Vermont. Before joining the University of Vermont, he was the dean of the John Molson School of Business, Canada, and the Canada research chair of organizational sustainability and the director of the Centre for Responsible Organizations at Wilfrid Laurier University, Canada. His research focuses on how organizations develop internal motivations and build capacity and capabilities to reconcile their economic, social, and environmental performance and generate competitive advantage via sustainable business models in developed and developing nation contexts. His research has been published in journals such as *Academy of Management Executive, Academy of Management Journal, Academy of Management Review, Journal of Marketing, and Strategic Management Journal*.