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Mousavi, Seyedesmaeil; Bossink, Bart

published in

Environmental Innovation and Societal Transitions
2020

DOI (link to publisher)

[10.1016/j.eist.2019.12.005](https://doi.org/10.1016/j.eist.2019.12.005)

document version

Publisher's PDF, also known as Version of record

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citation for published version (APA)

Mousavi, S., & Bossink, B. (2020). Corporate-NGO partnership for environmentally sustainable innovation: Lessons from a cross-sector collaboration in aviation biofuels. *Environmental Innovation and Societal Transitions*, 34, 80-95. <https://doi.org/10.1016/j.eist.2019.12.005>

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Original Research Paper

Corporate-NGO partnership for environmentally sustainable innovation

Lessons from a cross-sector collaboration in aviation biofuels

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ARTICLE INFO

Keywords:

Cross-sector partnerships
Corporate-NGO partnerships
Innovation
Environmental sustainability
Dynamic capabilities

ABSTRACT

This paper studies the initiation of a partnership between a corporation and a nongovernmental organization (NGO) for environmentally sustainable innovation, as well as its development over time. Proceeding from a dynamic capabilities approach, it provides a retrospective, longitudinal examination of a 10-year partnership between KLM Royal Dutch Airlines (KLM) and the World Wildlife Fund for Nature Netherlands (WNF), which promoted a market for aviation biofuels. The case study suggests that the progress of the partnership is determined by three specific dynamic capabilities of KLM and WNF: learning, coordination, and reconfiguration. The results reveal two microfoundations for each of these dynamic capabilities. For learning, these microfoundations are the sensing of strategic partners and the co-specialization of resources. For coordination, these consist of finding a fit between partners and having an integrated mission. Finally, the microfoundations of reconfiguration are the fostering of an institutional dialogue and the setting of new industry standards. This study is beneficial to scholars as it opens a research avenue concerning the dynamic capabilities and microfoundations that support corporate-NGO partnering for environmentally sustainable innovation. Practitioners can use these dynamic capabilities and microfoundations as guidelines for developing their own specific corporate-NGO partnerships.

1. Introduction

Progress toward environmental sustainability requires a socio-technical transition, which both entails new technologies and implies changes in markets and governing institutions (Loorbach et al., 2010). Environmental sustainability can be seen as a complex, multi-dimensional concept that often cannot be addressed through any single corporate action (e.g., Van den Bergh et al., 2011). Many leaders of business and industrial sectors agree that addressing challenges relating to environmental sustainability requires unparalleled cooperation (Clarke and Crane, 2018). In other words, few single organizations or sectors have the knowledge or resources to “go it alone” (Gray and Stites, 2013). As emphasized in recent studies, many companies actively seek partnerships with a variety of organizations and sectors in order to realize environmentally sustainable innovation (e.g., De Marchi, 2012; Hartman et al., 1999; Horbach, 2008). Environmentally sustainable innovation (hereinafter referred to as ESI) can be defined as the innovative and

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<https://doi.org/10.1016/j.eist.2019.12.005>

Received 3 December 2018; Received in revised form 29 November 2019; Accepted 12 December 2019

Available online 14 January 2020

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potentially transformative corporate activities that challenge existing practices and generate new products and processes that deliver value-added economic performance while also benefitting the natural environment (Hellström, 2007; Rennings, 2000; Varadarajan, 2015). One of the key drivers of ESI realized through partnerships is the need to address complex environmental problems that are too large or intractable for a single organization or sector to tackle by itself (Clarke and Crane, 2018; Harman et al., 2015).

In recent years, partnerships between corporations and nongovernmental organizations (NGOs) have become prevalent in efforts to address complex environmental challenges, such as climate change (Bitzer and Glasbergen, 2015; Kolk and Lenfant, 2012). Kourula and Laasonen (2009: 36) define NGOs “as social, cultural, legal, and environmental advocacy and/or operational groups that have goals that are primarily non-commercial.” One important logic underlying the popularity of corporate-NGO partnerships for ESI is that partners make mutual use of each other’s complementary resources and competencies. One primary purpose of many corporate-NGO partnerships is to integrate sustainable practices into the value chain and production systems, as organizations are unlikely to be able to accomplish this independently (e.g., Bitzer and Glasbergen, 2015; Dahan et al., 2010b). To this end, relationships between corporations and NGOs often shift from non-stakeholder relationships to relationships based on collaboration (Joensuu et al., 2015). Accordingly, the collaboration between corporations and NGOs is growing and becoming more strategically important in practice, as well as in the literature (Austin and Seitanidi, 2012; Bitzer and Glasbergen, 2015; Clarke and Crane, 2018). Despite evidence that resource complementarity is important to the formation and outcomes of corporate-NGO partnerships for ESI, the literature offers little insight into the specific dynamic capabilities that are needed to establish and promote resource complementarity (e.g., Idemudia, 2018; Marano and Tashman, 2012).

Dynamic capabilities reflect the ability of organizations to integrate, build, and reconfigure existing resources, as well as to combine them with external resources to cope with and, possibly, to shape rapidly changing environments (Teece, 2012). Dynamic capabilities may also determine the ability of organizations to implement changes with regard to their resources and competencies, and to contribute to the transition toward a more environmentally sustainable industry (Darmani et al., 2017; Lieberherr and Truffer, 2014). Helfat and Peteraf (2009) recommend that different types of dynamic capabilities should be investigated specifically for different tasks, as well as within their specific contexts. In line with Helfat and Peteraf (2009); Iles and Martin (2013) argue that organizations are better able to bring new, environmentally sustainable technologies and products to the market effectively when they mobilize their dynamic capabilities to address concerns relating to environmental sustainability. An understanding of these dynamic capabilities is a key prerequisite to the ability to search for and promote complementarity between the resources of a corporation and those of an NGO within a partnership for ESI.

In line with the observations stated above, this research aims to uncover further details concerning the process through which a specific cross-sector partnership for ESI between a corporation and an NGO was initiated, how it has developed, and how it is governed. This study argues that a partnership between a corporation and an NGO depends on the strategic needs of both organizations to combine complementary resources and competencies, as well as on the relevant dynamic capabilities of the organizations to do so. The research question is therefore as follows:

What dynamic capabilities do a corporation and an NGO need in order to establish and to promote resource complementarity in a partnership for ESI?

This question is addressed through a retrospective longitudinal case study of a 10-year corporate–NGO partnership between KLM Royal Dutch Airlines (KLM) and the World Wildlife Fund for Nature Netherlands (WWF). These partners worked together from 2007 through 2016 to initiate and stimulate a market for sustainable aviation biofuels. This study contributes to existing studies by identifying specific dynamic capabilities – also referred to as microfoundations of dynamic capabilities – that a corporation and an NGO need in order to integrate, build, and reconfigure their complementary resources within a partnership for ESI.

Section 2 starts with an overview of the literature on corporate-NGO partnerships for ESI. Drawing on the dynamic-capabilities approach to the phenomenon of corporate–NGO partnership for ESI, it develops a conceptual foundation for the KLM-WWF case study. The basic methods, principles, and measures of the case study research methodology are presented and explained in Section 3. Section 4 describes the KLM-WWF partnership, as well as its ESI activities and performance. Finally, Sections 5 and 6 discuss the implications of the findings, describe the limitations of the study, and suggest directions for possible future research.

2. Theoretical background

2.1. Corporations and NGOs collaborating for ESI

Many ESI initiatives are directed toward improving technological processes, achieving competitive advantage, and lowering production costs (Bos-Brouwers, 2010; Dangelico, 2015; Varadarajan, 2015). The integration of environmental sustainability into the process of innovation adds complexity, as it often entails the involvement of a wide range of stakeholders (Hall and Vredenburg, 2003). The complexity of ESI also stems from a multitude of external demands from various stakeholders with varying agendas. This complexity affects the entire innovation process, from the design of an environmentally sustainable product, to its production, and to marketing practices related to it (Sargut and McGrath, 2011). The complexity also results from the uncertainty and variety of the technological and market domain within which the new environmentally sustainable process or product technology must compete (Cainelli et al., 2015). Moreover, ESI often requires a radical technological change, or even the alteration of a complete system (Carrillo-Hermosilla et al., 2010; Nill and Kemp, 2009). In addition, the realization of innovative solutions for environmental sustainability often requires creating and integrating practices across organizational boundaries (cf., Carlile, 2002). In many cases, ESI demands a socio-technical transition, which entails innovative technologies, as well as innovations in both market logics and institutional governance.

Given that sustainability is a complex and multi-dimensional concept that often cannot be addressed by any single corporate action (e.g., Kolk and Lenfant, 2012; van den Bergh et al., 2011), corporations may engage in unique collaborations with environmental NGOs as potential partners for ESI (Holmes and Smart, 2009). Corporate-NGO partnerships are categorized as “cross-sectoral collaborations” (Harman et al., 2015) between corporations and nongovernmental organizations (NGOs). This type of partnership helps both organizations to leverage expertise and to share risks (Harman et al., 2015; Selsky and Parker, 2005). Accordingly, such partnerships require the partners to go beyond their own logics, organizational routines, and practices, particularly when addressing complex problems (Carlile, 2002; Dougherty and Dunne, 2011).

The use of more collaborative and interactive organizational arrangements, particularly the collaboration between corporations and NGOs, is increasingly driven by the need to address issues other than those of a purely economic nature (Holmes and Smart, 2009). For example, as demonstrated by Rondinelli and London (2003), in collaborative relationships between corporations and NGOs, the corporations often pursue more formal alliances with NGOs to tackle environmental management problems. Such arrangements allow corporations to deliver ESIs and receive enhanced legitimacy for their efforts through the associated NGOs (Holmes and Smart, 2009). Corporations and NGOs collaborate to utilize each other's complementary resources and competencies. These collaborations help both organizations to deal with issues that they would otherwise not be able to address (Austin, 2000; Bitzer and Glasbergen, 2015). Shumate et al. (2016) argue that, in their partnerships, NGOs mainly seek economic capital associated with greater perceived competency, whereas corporations mainly seek social capital. To corporations, NGOs can be an external source of specialized skills and knowledge, particularly when the internal development of such expertise is costly, inefficient, and time-consuming (Peloza and Falkenberg, 2009). In these types of partnerships, NGOs also provide a variety of competencies and resources, including market knowledge, legitimacy among clients/customers, civil-society actors, and governments, as well as access to local expertise and systems for sourcing and distribution (Dahan et al., 2010b).

The extensive body of literature on partnerships between corporations and NGOs for purposes of ESI indicates considerable variation in partnership arrangements, ranging from adversarial to cooperative, with many combinations between these extremes (Austin, 2000; Austin and Seitanidi, 2012; Van Huijstee and Glasbergen, 2010). Relationships between corporations and NGOs often evolve through a “reactive-to-proactive” strategy, in which pressure from NGOs, governments, and other stakeholders leads a corporation to move beyond resistance and mere compliance toward strategic proactive behavior in favor of ESI (Austin, 2000; Austin and Seitanidi, 2012). Many studies have examined partnerships for ESI as a way in which corporations can gain access to and further develop various complementary resources, while also managing legitimacy with clients/customers as a source of competitive advantage. Many of these studies are conducted from the perspectives of the resource-based view of the firm (e.g., Lin, 2012), resource dependence theory (e.g., den Hond et al., 2015; Lambell et al., 2008), stakeholder theory (e.g., Dahan et al., 2010a; Holmes and Smart, 2009; Joensuu et al., 2015), institutional theory (e.g., Marano and Tashman, 2012), and agency theory (e.g., Guay et al., 2004). Cross-sector collaborations proceeding from these streams of thought are based on the premise that each partner will contribute a variety of resources and competencies, which could potentially be complementary in the design and implementation of innovative solutions to sustainability challenges (Holmes and Smart, 2009).

The resource-based view of the firm (RBV) emphasizes the significance of the internal resources and competencies of an organization in explaining its innovativeness (Barney, 2001). As highlighted in the RBV, the resources and competencies needed for innovation are organization-specific and embedded within the daily routines of the organization. In line with this, Lin (2012) argues that one main motive that organizations have for establishing cross-sector partnerships is the desire to gain access to complementary resources and competencies from partners in order to achieve ESI.

Resource dependence theory (RDT) proposes that the survival and success of organizations is dependent on their ability to acquire and maintain control of scarce resources. Organizations that lack essential resources will seek to establish relationships with other organizations – often through formal and informal collaboration – to acquire these resources (Pfeffer and Salancik, 2003). For example, building on RDT, Den Hond et al. (2015) explain the likelihood of corporate-NGO partnerships and their results to show that corporations acquire essential resources through partnerships with NGOs and that they aim to leverage the complementary resources and competencies of the NGO partners in their business activities.

Stakeholder theory is based on the notion that the success of an organization is dependent on how well it manages the relationships with its stakeholders (Freeman, 1999). This implies that effective organizations pay attention to the relationships that affect them, as well as those that they affect. For example, in line with this theory, Joensuu et al. (2015), focusing on the concept of social proximity as an attribute in the relationships between corporations and NGOs, find that corporations seek to enhance the legitimacy of their environmental management by constructing more socially proximate relationships with NGOs.

Institutional theory argues that the obligation that organizations have to comply with external institutional pressure allows them to portray themselves as legitimate, thereby enhancing their likelihood of survival. The survival of an organization is determined by the extent to which it is aligned with the institutional environment (DiMaggio and Powell, 1983). Suchman (1995: 574) defines legitimacy as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions.” For example, Marano and Tashman (2012) show that corporations are not motivated purely by economic rationality, but also by the desire for legitimacy within the environments in which they operate. By partnering with NGOs, corporations establish and/or maintain social legitimacy to operate (see also Dahan et al., 2010b).

Agency theory focuses on the relationship in which an organization – the principal – delegates work to another party – the agent. Agency theory seeks to explain risk-sharing problems that arise when cooperating organizations enter into principal-agent relationships, given the differences in their attitudes, perceptions, and behaviors with regard to risk (Eisenhardt, 1989). Drawing on insights from agency theory, Guay et al. (2004) investigate how and when NGOs will have the most influence in shaping the

orientation of corporations toward ethical and social responsibility. Accordingly, they highlight ways in which NGOs can influence corporations through direct ownership stakes, public advocacy, and pressure on other stakeholders.

Research by Idemudia (2017) focuses on corporate-NGO collaboration more from the perspective of the NGO actors involved in the collaboration. The results of this research highlight a tension between various strategies that NGOs adopt in their cooperation with corporations. Some NGOs adopt a more confrontational approach, in which they are opposed to corporations. Some take a more collaborative approach, with the NGO trying to cooperate with corporations in order to help them improve their sustainable performance. Regardless of the approach that it adopts, the NGO remains vulnerable to “takeover” by the corporations with which it cooperates, and it must protect its independent position (Idemudia, 2017). Drawing on insights from the paradox literature, Sharma and Bansal (2017) argue that corporate-NGO partnerships must engage in a commercial-social paradox in order to address societal issues successfully. The commercial-social paradox refers to the situation in which “businesses want social impact, but need to meet their commercial demands; NGOs need financial support but have social ambitions. However, commercial and social demands reflect contradictory organizational goals, structures, processes, and skills” (Sharma and Bansal, 2017: 342). According to Sharma and Bansal (2017), incorporating this paradox into the relationship between the corporation and the NGO leads to collaborative, generative outcomes, and failure to engage with this paradox can derail even the most basic ambitions of a partnership.

Although corporate-NGO collaborations for ESI have received considerable attention in recent years, existing studies have paid less attention to identifying the specific dynamic capabilities that corporations and NGOs should possess in order to integrate, build, and reconfigure complementary resources within their partnerships for ESI.

2.2. Dynamic capabilities of corporations and NGOs in partnerships for ESI

From a dynamic-capabilities perspective, organizations enter into cross-sector partnerships to gain access to and co-create new resources and competencies (Ahuja, 2000; Austin, 2000; Austin and Seitanidi, 2012). In the literature, resources are defined as the assets, organizational processes, technical expertise, management skills, human capital, and immaterial reputations that enable organizations to conceive of and implement their strategies (Barney, 1991). The value of a partnership depends on how the partners develop, combine, and orchestrate their internal resources with external resources, thereby facilitating the exploitation of opportunities within their respective business environments (Helfat and Peteraf, 2003). Beyond these resources, therefore, organizations must be able to adapt, integrate, and reconfigure their internal and external resources. The role of these “dynamic capabilities” (Teece, 2007; Teece et al., 1997) is to renew resources and competencies, thereby ensuring a better match with a changing business environment (Eisenhardt and Martin, 2000; Teece et al., 1997). To generate innovative responses to rapidly evolving environments, partners need dynamic capabilities for acquiring and synthesizing internal and external resources (Helfat et al., 2007).

As argued by Planko et al. (2016), market creation for innovative environmentally sustainable technologies or products often involves extensive changes to the macro-environments within which the innovating companies operate. Moreover, as demonstrated by Sarasvathy and Dew (2005), the creation of a new market requires an effectual group of stakeholders collaborating within the network or industry cluster to shape a favorable environment for their new technology. The dynamic capabilities of partners in cross-sector partnerships can establish and promote resource complementarities that enable the partners to identify opportunities, to coordinate actions in pursuit of the recognized opportunities, and to develop ESIs (Teece et al., 1997). The concept of dynamic capabilities as a coordinative management asset also opens the door to potential inter-organizational learning (Teece et al., 1997). It is interesting to note that the concept of dynamic capabilities can also be useful in explaining processes of organizational change, particularly with regard to dimensions including innovation, entrepreneurial behavior, or organizational transformation (Ambrosini and Bowman, 2009; Helfat and Martin, 2015). According to the dynamic-capabilities approach, the organizing process must extend beyond the boundaries of a company, as necessary resources and competencies can be found outside the organization – often embedded within inter-organizational resources and routines (Helfat et al., 2007). The dynamic-capabilities approach can thus serve as an analytical framework within which to explain the formation of effective corporate-NGO partnerships. It can also be used to explore the dynamic capabilities that are required for the establishment of resource complementarity within corporate-NGO partnerships for ESI.

The present study adopts the threefold classification of dynamic capabilities proposed by Teece (1997) as a theoretical foundation for investigating the dynamic capabilities that corporations and NGOs need in order to establish and promote resource complementarity within partnerships for ESI. Teece et al. (1997) divide dynamic capabilities into three types: learning, coordination, and reconfiguration.

Learning capabilities help organizations to explore new resources and competencies, as well as to involve information exchanges based on past experiences and the absorption of external information in partner relationships. Accordingly, dynamic capabilities include cognitive skills and organizational processes that enable organizations to identify, address, and combine resources to create new markets and technologies (Pitelis and Teece, 2010). Organizations must possess high sensing and opportunity recognition capabilities if they wish to uncover and promote the latent demand, thereby increasing supply and stimulating market creation (Day, 1994). Partnerships provide opportunities for learning about appropriate environmental sustainability solutions, as well as about disruptive innovations and market opportunities in this area (Adams et al., 2012).

Coordination capabilities include the organization’s formal and informal efforts to define the specific resources that it can obtain (Zahra and Nielsen, 2002). Coordination capabilities help partners to adjust their shared understandings of problems and activities, to achieve their goals, and to resolve problems. Given the complexity of ESI, organizations often need to find partners who can provide complementary resources and competencies. For example, depending on its own resources, an organization may need to draw on the engineering competence of another organization in order to develop new sustainable products, new distribution channels through

which to reach new groups of customers, and/or to develop a renewed reputation in the market as a pioneer in sustainability. Pitelis and Teece (2010) argue that one significant cognitive and strategic skill in the context of such innovation involves understanding the role of complementary resources.

Reconfiguration capabilities refer to the joint actions that partners take to ensure the continuous reconstruction of their resource bases to meet the evolving demands of changing environments, as well as to address them rapidly (Teece et al., 1997). As argued by Dahan et al. (2010b), in cross-sector partnerships, partners contribute complementary resources along the value chain to develop products or services that neither of the partners would be able to produce alone. According to Pitelis and Teece (2010), complementary resources are co-specialized, such that the value of the resources of one partner is a function of using resources in conjunction with the resources of the other partner. Reconfiguration capabilities are particularly relevant, as they form a base for the joint development of ESIs (Ettlie and Pavlou, 2006).

3. Research methods

3.1. Research design

This empirical research is based on a retrospective, longitudinal case study aimed at developing new insight into the dynamic capabilities of a corporation and an NGO engaged in a partnership for ESI (cf. Yin, 2009). This in-depth, qualitative approach allowed the exploration of key events in actual practice, as well as the logic underlying these events. Case-study research makes it possible to focus on a phenomenon in its actual setting (cf. Welch et al., 2011; Yin, 2009). According to Yin (2009), case studies are well suited to seeking answers to research questions focusing primarily on “what” aspects, as does the research question on which this study is based: “What dynamic capabilities do a corporation and an NGO need in order to establish and to promote resource complementarity in a partnership for ESI?”

In the case selected for this study, the phenomenon of interest was quite prominent, thereby making it easy to observe (cf. Pettigrew, 1990). The case study focused on a long-standing, ongoing corporate-NGO partnership, which ran from 2007 through 2016 for the purpose of developing a market for sustainable aviation biofuels. In this partnership, the corporation (KLM) and the NGO (WNF) focused on the potential of biofuels in the aviation sector to mitigate climate change. The partnership between KLM and WNF was particularly suitable for study, as it was deliberately built around a collaboration for ESI. The main ESI goal in this partnership was to reduce CO₂ emissions by increasing the supply and use of sustainable aviation biofuels. Aviation currently accounts for about 3.5 % of worldwide CO₂ emissions (Baumeister and Onkila, 2017, 2018). The long duration of this partnership (10 years) allowed a retrospective longitudinal study of the processes characterizing the partnership over time (Poole et al., 2000). Another reason that made the KLM-WNF partnership particularly suitable as a case to be studied has to do with the problem-driven approach adopted by the partners. More specifically, the organizations took a particular environmental-sustainability problem – CO₂ emissions – as a starting point for their partnership, and subsequently sought solutions to the problem. The partnership accordingly served as a critical case study, as it elaborated and refined an existing theory for application in the context of corporate-NGO partnerships for ESI (cf. Yin, 2009). The study was conducted through the theoretical lens of the dynamic-capabilities approach, applying a retrospective, longitudinal research design to explore and analyze the underlying dynamics of the partnership for ESI over time.

A single-case research approach was adopted to develop a profound and detailed understanding of the dynamics existing within the KLM-WNF partnership for ESI (cf. Yin, 2009). This type of case study has a relatively high degree of internal validity, as long as appropriate procedures are followed in its design and implementation (cf. Welch et al., 2011). To this end, strategies with regard to external validity, reliability, construct validity, and internal validity were adopted as a means of achieving rigor in the case study. An

Table 1

An overview of adopted strategies for ensuring rigor of the study.

External validity (research design)	Reliability (data collection)	Construct validity (data collection)	Internal validity (data analysis)
The dynamic capabilities approach is used as a theoretical lens of the case study.	A case study protocol is developed to specify how the entire case study searched for data from interviews and archival sources.	Multiple sources of evidence, including 14 expert interviews and 166 archival sources are used during data collection to triangulate the data.	The dynamic capabilities approach is adopted as a theoretical lens of the study to guide data gathering and analysis.
In view of the research question and research design, a rich retrospective longitudinal case study research approach is used.	A case study database is built, which includes all available archival data and interview and focus group transcripts. It is used to develop a chain of evidence.	The case report is reviewed by the key informant of the case and by two senior researchers.	The data analysis procedure (coding procedures and use of coding software) is explained to show how the case study went from the raw data to final case analysis.
A critical case is selected to elaborate the dynamic capabilities approach to the context of a corporate-NGO partnership for ESI.			The empirical findings of the case study are compared with previous studies to provide an insight into the merits and limitations of the research outcomes.
The details of the empirical setting were recorded in a case study database.			

overview of the measures used and actions taken for each of these criteria is presented in [Table 1](#).

3.2. Data collection

As part of the Air France-KLM group since the 2004 merger, KLM has aimed to be a leader in the airline sector with regard to issues of sustainability in aviation. Notably, climate impact has long been one of the main topics of its sustainability strategy. For several consecutive years, the Air France-KLM group has held a position at the top of the “Airlines” category of the Dow Jones Sustainability Index (DJSI), based on its relatively strong efforts for sustainability, as compared to other airlines. With its Climate Action Plan, KLM has set specific targets to reduce its environmental impact in terms of CO₂ emissions. The NGO partner, WNF, is part of the international conservation organization World Wildlife Fund for Nature (WWF), and it is located in the Netherlands. Its primary goals are to reduce human environmental footprints, to promote the sustainable production of goods, to lessen the threat of climate change, and to promote solutions.

The study involved gathering a broad range of primary and secondary data sources, including semi-structured interviews and archival data, and compiled them into a case-study database for developing a chain of evidence, using Atlas.ti software (cf. [Yin, 2009](#)). Data collection started by interviewing key informants within the partnership. The primary contact – the Environmental Manager at KLM, who held a coordinating role within the partnership – served as a central source for identifying key informants. In all, 14 interviews were conducted, each lasting between 45 and 90 min. Interviews were held with eight informants who played roles within the partnership. The informants included two WNF employees, four KLM employees, and two employees from SkyNRG, the global market leader in the emerging market segment of next-generation biofuels for aviation, which was co-founded by KLM in 2010 to initiate and accelerate the development of a market for aviation biofuels. The Environmental Manager at KLM was interviewed twice, given the coordinating role that this official played within the partnership. To enhance understanding concerning the aviation-biofuels market, interviews were also held with two officials from other major European airlines offering flights powered by biofuels. The remaining interviewees were a policymaker at the Ministry of Infrastructure and the Environment (Dutch government) and a respondent from the Roundtable on Sustainable Biomaterials (RSB). An independent, global multi-stakeholder coalition, RSB employs a certification system to promote the sustainability of biofuel. A list of interviewees is presented in [Table 2](#).

To mitigate any potential retrospective biases in the study ([Golden, 1992](#); [Miller et al., 1997](#)), data was collected from respondents representing seven organizations, thus tapping into potential differences in their perspectives toward the market for aviation biofuels. In addition, the interview data was triangulated with archival data, in order to achieve a thorough understanding of the research phenomenon (cf. [Denzin and Lincoln, 2007](#)). The archival data sources consisted of three WWF Corporate Partnerships Reports, one WWF Energy Vision document, two marketing brochures on aviation biofuels, 13 public interviews about the partnership, 123 publicly available news publications and press releases about the partnership, 14 secondary data reports published by scholars about the aviation-biofuels market, and 10 annual reports from KLM (for a total of 166 sources). Archival data was used to compile a retrospective record of the entire 10-year partnership for ESI.

After the round of interviews, a focus-group discussion was moderated and recorded to enhance understanding of the partnership ([Morgan, 1997](#)). Focus groups are used for clarifying, extending, qualifying, or challenging data collected through other methods ([Bloor et al., 2001](#)). A group of key informants – including two individuals from WNF, three from KLM, and one from SkyNRG – participated in this focus group. At the beginning of the discussion, the initial findings from the interviews were presented. The participants were then asked to share information and their views on the partnership, to elaborate on the development of the aviation-biofuels program, and to seek a path toward further increasing the supply and the demand for sustainable biofuels in the aviation sector.

Finally, the case description resulting from the above data collection approach was sent to the primary contact (the Environmental Manager at KLM) in order to further ensure that it represented a true understanding of the partnership. The contact's comments resulted in several minor modifications to the case description. This full case description served as the source for the case study findings reported in this study. For readability, in this text of this study verbatim quotations have been edited, leaving scope

Table 2
List of interviewees.

Interviewee	Organization
Director CSR & Environmental Strategy	KLM
Environmental Manager	KLM
Director Innovation, Corporate Venturing & Biofuels	KLM
Innovation Manager	KLM
Program Manager at Public Affairs	KLM
Senior Advisor Biomass	WNF
Chief Footprint and Markets	WNF
Chief Executive Officer (CEO)	SkyNRG
Marketing & Sales Manager	SkyNRG
Senior Manager Aviation Biofuels	A European Airline
Head of New Energies	A European Airline
Executive Secretary	RSB
Senior Policy Maker	Dutch Government

Table 3
Sequence of events in the KLM-WNF partnership for ESI.

Year	Action/Interaction
2007-2009	KLM engaged with WNF as a partner in 2007 to develop and maintain their climate strategy and biofuels program. The partnership has formulated an integrated strategy for KLM on supply of, and demand for biofuels for aviation.
2008	KLM joined the Sustainable Aviation Fuel Users Group (SAFUG) as a member to focus on the development and commercialization of sustainable aviation biofuels.
2009	The launch of the first demonstration flight on biofuels ever with passengers on board. WNF was part of the process.
2010	SkyNRG was launched. Founding partners are KLM, Argos Energies and Spring Associates. WNF advises SkyNRG on sustainability aspects.
2011	KLM and WNF renewed their partnership for another 4 years.
2011	KLM closed a Green Deal on biofuels with the Dutch Ministry of Economic Affairs, Agriculture & Innovation, and the Dutch Ministry of Infrastructure & Environment. KLM is also committed to using biofuel certified by RSB.
2011	KLM launched the first commercial flight ever to use sustainable biofuels, soon followed by a 6-month program of sustainable biofuels flights between Amsterdam and Paris.
2012	KLM launched the KLM Corporate Biofuels Program.
2013	SkyNRG's commitment to sustainability of biofuels for aviation was rewarded by RSB, making SkyNRG the first jet-fuel operator worldwide to deliver RSB-certified sustainable biofuels at any airport in the world.
2013	KLM launched a new series of flights using sustainable biofuels.
2015-2016	KLM and WNF finalized their current partnership. KLM and WNF continued collaboration on a neutral basis, without financial ties

and content intact; key original verbatim quotations are presented in [Table 4](#).

3.3. Data analysis

The partnership was the central level of analysis. The study focused on how the corporate-NGO partnership was initiated, developed, and maintained over time. In the first step of the analysis, a narrative of the partnership was created (cf. [Langley, 1999](#)). Based on the data that was gathered and analyzed, a chronological overview of the partnership events and its dynamics was made, including the drivers of partnership formation, the motivations for building the partnership, the positions of the partners toward ESI, and the outcomes and challenges of the partnership. A summary of this chronological sequence of key events in the partnership is presented in [Table 3](#).

The researchers adopted an inductive approach to analyzing the data from the narrative, using the Gioia methodology in the coding process (cf. [Gioia et al., 2012](#)). In the first-order analysis, the data was coded based on in-vivo informant terms. [Strauss and Corbin \(1990\)](#) refer to such first-order coding as “open coding.” The first-order concepts originated from the interviews and were triangulated by the archival data. The first-order concepts are presented on the left side of [Fig. 1](#).

Using dynamic capabilities theory as a sensitizing concept, the second step in the analysis consisted of searching for similarities and linkages among the first-order concepts in order to develop the second-order themes, as shown in the middle of [Fig. 1](#). The identification of second-order themes, which represent the microfoundations, is referred to as “axial coding” ([Strauss and Corbin, 1990](#)). The third analytical step, theoretical coding, consisted of distilling the emergent second-order themes or microfoundations into aggregate dimensions. In this step, which was guided by the dynamic capabilities approach, the researchers assessed the semantic relationships among the second-order themes and aggregated them into the three selected dimensions of the dynamic capabilities approach (as depicted on the right side of [Fig. 1](#)).

[Table 4](#) highlights key first-order data in support of the second-order themes (microfoundations) and aggregated dimensions (dynamic capabilities). The structure in [Table 4](#) was used as a basic framework for describing and analyzing the case.

4. Case-study findings

4.1. Basic information about the KLM-WNF partnership

While implementing an Environmental Management System (EMS) in the company in 1996, KLM recognized that the climate issue had become one of the main topics of its sustainability strategy. The airline company sought to develop a more proactive sustainability strategy in order to comply with, and even exceed governmental regulations on CO₂ emissions, which were expected to become more stringent. To this end, KLM adopted a relatively prominent role in the aviation industry with respect to combating climate change and investing in CO₂ efficiency, with the objective of establishing standards in this area. In developing its “Climate Action Plan,” KLM identified the use of biofuels as one of the most important ways to reduce CO₂ emissions, given that 99 % of its current CO₂ footprint was due to fuel usage. Increasing usage of biofuels could help the company to reduce its CO₂ footprint in the medium term. The Environmental Manager at KLM confirmed this objective as follows:

“The use of biofuels is currently our only option for reducing our carbon emissions. While developing our Climate Action Plan, we identified a need for enablers. In addition, through our partnership with WNF, it became apparent that there was not much that we could do, except for reducing carbon emissions in the short-term. The only solution for the medium term was the use of biofuels, which had not existed when the Climate Action Plan was developed.”

This was the starting point for KLM's efforts to develop its biofuels program from 2007 through 2009. The partnership between

Table 4

Representative Quotes, Events, and Archival Data Underlying Second-Order Themes.

Learning Capabilities: Dimension 1	
Sensing strategic partners	<p>“The [WNF’s] Climate Savers program rates corporate climate performance by means of two dimensions, or two leadership pillars: 1. To become the best in class in reducing greenhouse gas emissions in line with climate science, and 2. To influence market or policy developments by promoting their vision, solutions and achievements. The intention of the program is to inspire a change in thinking about climate solutions in companies and as agents of change within their sphere of influence.” (WNF- Archival data)</p> <p>“Since 2008, KLM has had a Climate Action Plan for the purpose of taking targeted steps to curb the impact of its operations on the climate. The goal is to reduce the CO₂ emissions per passenger to 20% by 2020 (based on 2011 levels).” (KLM- Archival data)</p>
Co-specialization of resources	<p>“KLM supports WNF conservation projects including in the Coral Triangle, for the conservation of Sea Turtles in Bonaire, and in Brazil (Acre-REDD).” (WNF- Archival data)</p> <p>“It is in the interests of everyone that flying is made more sustainable. This is why we are taking concrete steps to make sure that we burden the climate as little as possible: even in today’s difficult economic climate.” (KLM- Archival data)</p>
Coordination Capabilities: Dimension 2	
Fit between the business model, vision and strategy of partners	<p>“Flying less would reduce the need for biofuels in the future, and substantially reduce carbon emissions today.” (WNF- Archival data)</p> <p>“WWF and KLM end their partnership; WWF and KLM can look back on a successful partnership that started in 2007 and ended in 2015. A partnership that at first glance was quite unique; a nature conservation organization and an airline that work together to improve the climate. But shared concern about the impact of climate change as the greatest threat to people and nature laid a foundation for the partnership and ensured that differences in vision became bridged.” (WNF- Archival data)</p>
Integrated mission for the partnership	<p>“The expiry of the contract period was a logical moment to evaluate the collaboration. The conclusion is that the challenges for the further sustainability of the aviation industry are increasingly beyond the scope of this partnership.” (WNF- Archival data)</p> <p>“Sustainable biofuel makes a structural contribution to increasing the sustainability of the airline industry. KLM is committed to this aim, but cannot do it alone. It is therefore fantastic that more-and-more Dutch companies, like LVLN, are signing up to our Corporate Biofuel Program. Together we can make a difference.” (Pieter Elbers - KLM President & CEO; KLM- Archival data)</p>
Reconfiguration Capabilities: Dimension 3	
Fostering institutional dialogue	<p>“We therefore look back with pride on what we have achieved together within this partnership. Below is a selection of the most important results: [...] Launch of the Corporate Biofuel Program by KLM; Promoting the RSB standard as the most sustainable standard for the production of biofuels; [...], and Putting sustainable biofuels on the map internationally at various parties (airlines, European governments and international interest groups).” (WNF- Archival data)</p> <p>“The renewed cooperation with WWF Netherlands [WNF] should lead to an international breakthrough for sustainable biofuels for aviation. KLM and WWF Netherlands hope to unify international parties in a drive to get this market off the ground.” (KLM- Archival data)</p>
Setting industry sustainability standards	<p>“KLM is also committed to using biofuel certified by the Roundtable for Sustainable Biofuels (RSB).” (WNF-Archival data)</p> <p>“We congratulate KLM for its vision and leadership in committing to the purchase of RSB-certified biofuel. RSB has set the world’s highest standard for respecting people and the environment in biofuel production. Thanks to the efforts of KLM and SkyNRG, the world’s first RSB-certified supply chain for jet fuel is fully operational. This is a great moment for sustainability.” (Peter Ryus, CEO of RSB Services Foundation; KLM- Archival data).</p>

KLM and WNF started in 2007, with the objective of developing and maintaining KLM’s biofuels program. The partnership formulated an integrated strategy for sustainable biofuels based on a value-chain perspective, in which they aimed to create demand while simultaneously developing a supply chain. One remarkable feature of this strategy was that there was no market for aviation biofuels at that time. The use of biofuels was thus entirely new for the aviation industry. For this reason, KLM co-founded a joint venture, SkyNRG, in 2010, following the first KLM biofuel demonstration flight in November 2009. In addition to being part of the demonstration flight process, WNF served as an advisor to SkyNRG on aspects relating to sustainability. The joint venture did not own its aviation biofuels production capacity, but acted as a service provider – a central entity within the emerging network. It built the supply chain between airlines and producers of aviation biofuels. The KLM Innovation Manager had the following to say with regard to the goal of SkyNRG:

“When we started thinking about biofuels, they were scarce and difficult to find in the market, because there was hardly any demand. If you want to have more supply, there has to be more demand. This is why we also co-founded SkyNRG and placed it outside of KLM: so it could also serve as a supplier of aviation biofuels for KLM and other airlines, thereby increasing the demands within the aviation sector and helping the markets to grow.”

In 2011, KLM and WNF formally renewed their partnership for another four years. As part of the agreement, in 2011, KLM set an aspirational target to use an average of 1 % sustainable biofuels in its fleet by 2015. This expressed the ambition to develop an international market segment for sustainable biofuels within four years.

In June 2012, KLM launched the KLM Corporate Biofuel Program, in cooperation with SkyNRG and WNF, with the objective of

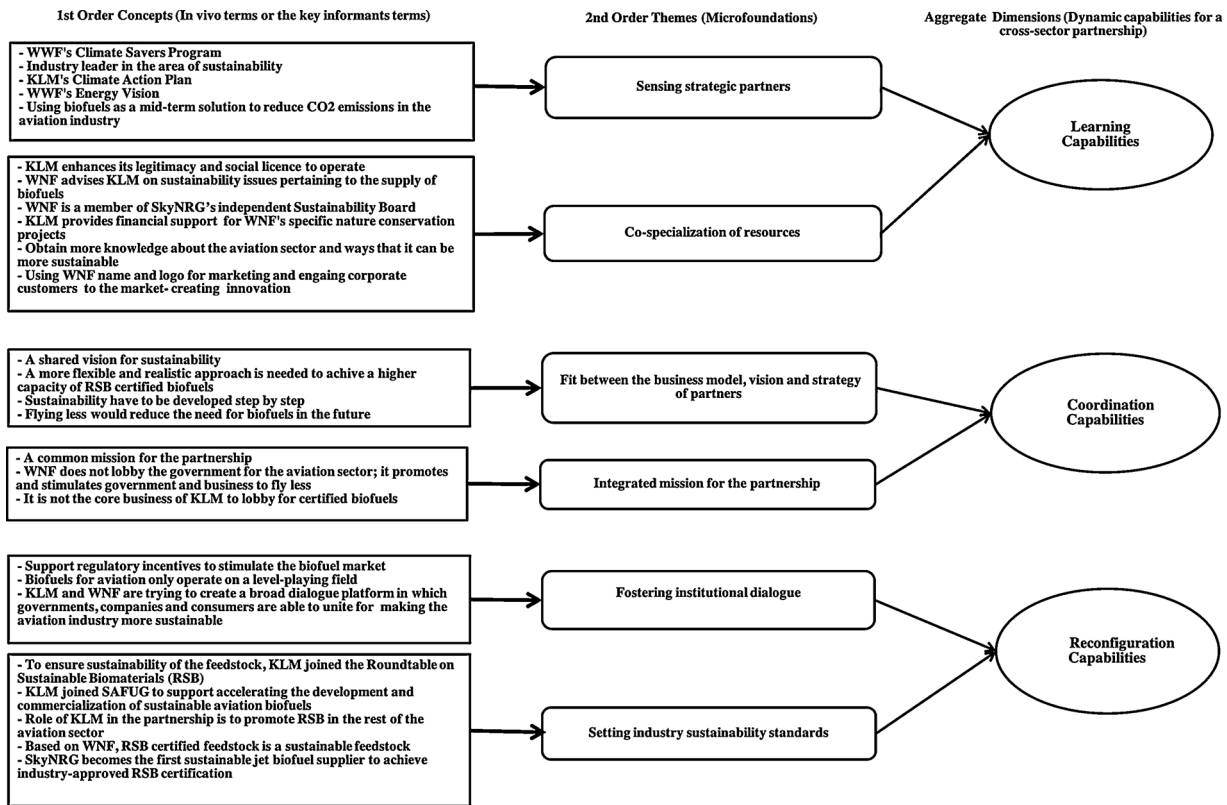


Fig. 1. Data Structure.

aggregating demand and making biofuels available in suitable quantities, at a competitive price, and without compromising on sustainability. The program enabled KLM to cover the additional costs of using biofuels for flights. Partners in this program committed to flying some of their journeys with aircrafts powered by biofuels, thereby contributing to reductions in CO₂ emissions. Instead of purchasing carbon credits to offset staff travel, corporations diverted the funds to the development of sustainable biomass production, required infrastructure, and key technologies. The Marketing and Sales Manager at SkyNRG explained the idea behind the KLM Corporate Biofuel Program as follows:

“We implemented the KLM Corporate Biofuel Program to bring production up to scale. I think the idea came because it is a whole supply chain, viewed from feedstock for flights. You need all of the players in the entire supply chain, but it only works if you involve end customers. Accordingly, we proceeded from demand, in order to bring the production up to scale.”

From the first commercial flight with biofuels in 2011 until 2016, KLM conducted flights that demonstrated the possibility of organizing and coordinating a complex supply chain for aviation biofuels and of flying regularly scheduled flights on aviation biofuels. The company invested in developing a production system to deliver biofuels that were demonstrably sustainable. At first, SkyNRG supplied mainly biofuels made from used cooking oil. Over time, however, KLM and SkyNRG were not limited to any single feedstock. For example, another biofuel used in a series of flights was based on camelina oil, an oilseed crop that is native to Northern Europe and Central Asia. This and other feedstock-based biofuels enabled KLM and SkyNRG to adopt a regional approach, choosing the most sustainable and cost-effective feedstock for specific regions in the world.

The three categories of dynamic capabilities – learning, coordination, and reconfiguration (Teecce et al., 1997) – provided a framework for analyzing the dynamic capabilities that KLM and WNF mobilized and effectuated in their partnership for ESI. Accordingly, for each of these dynamic capabilities, the analysis identified two basic microfoundations that facilitated and supported the KLM-WNF partnership for ESI.

4.2. Learning as a dynamic capability of partnering for ESI

Learning capabilities stimulated KLM and WNF to identify each other's unique complementary resources for the partnership for ESI.

4.2.1. Microfoundation of learning I: sensing strategic partners

There were two formal periods in the KLM-WNF partnering process: 2007–2011 and 2011–2015. The first period led to the

second, and the partnership evolved from CO₂ compensation to the production and use of sustainable biofuels. In the first period, the collaboration between KLM and WNF proceeded from a focus on CO₂ efficiency and CO₂ compensation, with little attention to biofuels. A senior advisor of biomass at WNF described the first period of the partnership as follows:

“Absolute reductions for aviation or the airlines did not seem to be a realistic target. At that time, biofuels were not a feasible option; it was said that biofuels would freeze at high altitudes. As a result, the focus of the collaboration was on compensating for the increase in CO₂.”

In its search for sector leaders, WNF aimed to engage KLM in its “Climate Savers Program,” which was intended to inspire a change in thinking about climate solutions in companies. The goal of the program was to develop business models that would achieve or surpass net-zero carbon emissions, thereby demonstrating that the reduction of greenhouse-gas emissions can go hand-in-hand with economic growth. At the same time, KLM sought to increase its CO₂ efficiency based on its Climate Action Plan. This objective was recognized by WNF, which realized that, as an airline, KLM could be interested in participating in the WNF Climate Savers Program. During this period, both parties came to realize that absolute CO₂ reductions for aviation were nearly impossible at that time. The partners therefore agreed to work on stabilizing carbon emissions. According to the Environmental Manager at KLM, this partnership approach was related to the business model of KLM:

“As an airline, we do not have flexible business models. Our main purpose is to carry passengers around the world. We cannot ground our aircraft or use green electricity to reduce our carbon emissions. The solution is thus our Climate Action Plan. The first step consisted of stabilization, combined with a carbon-compensation program. Although it did not meet the international principle of the Climate Savers Program, it was as far as an airline could advance toward being ‘best in class.’”

Based on the first period of the partnership and its Climate Action Plan, KLM recognized that the use of biofuels would be a better approach for the medium term, even though these fuels were not seen as a large-scale, viable alternative at that time. Once again, KLM continued to concentrate on CO₂ compensation, even as it was in a transition toward an approach that would be more amenable to biofuels. Because KLM had already recognized that biofuels would be a better option for the medium term, it launched a research project on alternative fuels. Meanwhile, WWF was developing its energy vision. The activities of the two partners were thus operating parallel to each other. According to the “WWF Energy Vision,” it would be possible for the world to achieve a full supply of renewable energy sources and to operate exclusively on energy from these sources. One key aspect in this regard involved developing biofuels into an essential resource for energy supply, particularly for those activities and sectors that had no other alternative to liquid fuels, including aviation, marine transport, and heavy trucking. To this end, KLM and WNF renewed their partnership, based on this energy vision. During the second period of the partnership, the organizations were involved with stimulating the market for sustainable biofuels for aviation.

4.2.2. *Microfoundation of learning II: co-specialization of resources*

Each of the partners had a different motivation to collaborate. For KLM, the motivation for the partnership was largely to attain legitimacy for its environmental management activities. The airline considered this partnership as a social license to operate. For example, as explained by the Environmental Manager at KLM:

“I think that what WNF added was obviously credibility. If we were to say about ourselves that we are excellent and best in class, nobody would believe us, at least not beyond a certain extent. It is better for someone else to tell it. This was the greatest benefit of this partnership. We could show them where we are, where we stand, and they could help us to gain recognition for it. They were a reference and a supporter.”

This provision of legitimacy also helped KLM to gain access to critical resources, including financial and social capital. For example, KLM and SkyNRG used the name and the logo of WNF in the KLM Corporate Biofuel Program in order to engage corporate customers in the program and to aggregate demand in the market.

The partnership also allowed KLM to gain access to the expertise of WNF in sustainability issues. For example, the airline learned how to develop and maintain a climate strategy, including a biofuels strategy. As a member of the independent Sustainability Board of SkyNRG, WNF advised KLM and SkyNRG about the supply of biofuels.

Through its biofuels program, KLM complemented WNF in its efforts to realize a part of the WWF Energy Vision. The primary goals of this vision were to eliminate fossil fuels and to achieve a 100 % renewable energy supply for everyone on the planet by 2050. Given that WNF saw itself as a solution-based NGO, its motivation for partnering with KLM was to acquire more knowledge about the aviation sector and about ways to increase environmental sustainability in this sector, while also searching for solutions and sharing them with other airlines. It also sought to realize financial benefits. For example, KLM provided financial support for several WNF nature-conservation projects.

4.3. *Coordination as a dynamic capability of partnering for ESI*

The interactions between KLM and WNF were supported by coordination capabilities, in order to adjust their common understanding of the partnership for ESI, to achieve their separate and shared goals, and to resolve problems.

4.3.1. *Microfoundation of Coordination I: Fit between business model, vision, and strategy of partners*

Although there was an overlap between the Climate Action Plan of KLM and the Energy Vision of WWF, there was not a full

strategic fit between the business models, visions, and environmental-sustainability strategies of KLM and WWF. The programs of WNF were partly at odds with the strategy of KLM. Although WNF engaged in a partnership with KLM, it also played an adversary role. For example, in addition to supporting KLM in its Corporate Biofuel Program, WNF worked on programs aimed at cutting flights and encouraging less flying. To a certain extent, KLM could sympathize with these efforts. For example, its more recent “Fly Responsibly” campaign calls on people to fly less (e.g., by taking other modes of transport for short distances). These objectives were nevertheless at odds with KLM’s basic strategy: flying passengers. Although the “Fly Responsibly” campaign aimed to assign a more nuanced position to environmental sustainability in KLM’s business, the company’s business continued to focus on aviation. As a senior biomass advisor from WNF explained:

“In our roadmap, the reduction of emissions is a key point. Therefore, looking at the roadmap for sustainable aviation, which includes reducing demand, flying less is a part of our vision for emissions reduction. The use of sustainable biofuels is another important part. As you see, our roadmap is larger than just the use of biofuels.”

According to most of the interviewees, the fundamental challenge to overcome was the shortage of RSB-certified feedstock. The RSB certification system used a series of norms to verify and classify the ethical, sustainable, and credible sourcing of feedstock. For example, as noted by a senior policymaker at a Dutch Ministry:

“I think the main challenge was the availability of sustainable feedstock and creating scale there. With regard to RSB-certified feedstock, this was not available in large and steady quantities.”

Biofuels certified by RSB remained a relatively tiny solution to a very large problem. Although KLM regarded RSB as a valuable entity, it realized that the impact of the roundtable was relatively small, and that it would need to increase in the years to come. At the start of a transition that had the potential to increase the capacity of RSB-certified biofuels and bio-fueled flights, KLM began to explore the possibilities for increasing the volume of RSB-certified biofuels. The two partners differed on this point, with WNF preferring to focus on quality instead of on quantity. In its view, given the continued growth in the absolute number of flights, the solutions on which KLM was working were smaller than the expanding problem of increasing CO₂ emissions – a problem that biofuels alone could not solve.

4.3.2. *Microfoundation of coordination II: integrated mission for the partnership*

At that point in the partnership, the differences in the expectations of KLM and WNF became more apparent, and it became obvious that the mission of the partnership was not completely integrated. The Chief of Footprint and Markets at WNF confirmed this:

“Each party, KLM and WNF, had a picture of what it wanted and why it was doing it. However, we were not twins; we did not have a common mission.”

For example, each of the partners had different expectations regarding the timeframe for reducing emissions. For KLM, the aim was to meet and, if possible, exceed the goals set by the International Air Transport Association (IATA). The company’s main goal was thus to stabilize emissions in 2020, after which it would strive to reduce its emissions. The ambitions of WNF were higher, however, with the goal of achieving emissions reductions even before 2020.

According to the Environmental Manager at KLM, aviation profit margins for flights and passengers were fragile and sensitive to price and cost. Biofuels were expensive in comparison to fossil fuels. Increased reliance on biofuels would therefore be likely to result in a deteriorating position for KLM in terms of cost, price, and profit. The implicit assumption underlying KLM’s viewpoint was that a level playing field in which biofuels and fossil fuels would have similar cost structures could be created only through government regulation. Meanwhile, WNF was acting in a different direction, placing its emphasis on encouraging airlines to cut flights. The organization did not join forces with KLM in its lobby to convince the government to make further investments in creating a level playing field through policy and regulation. The challenge presented by this situation and the solitary position that it created was palpable at KLM. As described by the its director of Corporate Social Responsibility & Environmental Strategy:

“We understand the concerns of WNF, but they are largely the concerns of an NGOs. They should also help business realization. If they cannot do that, then what? This requires focus, attention, and a lobby network. This area was also new for us.”

4.4. *Reconfiguration as a dynamic capability of partnering for ESI*

Reconfiguration capabilities helped KLM and WNF to work together to stimulate and orchestrate a value chain for ESI.

4.4.1. *Microfoundation of reconfiguration I: fostering institutional dialogue*

Although a joint lobby was difficult to accomplish, KLM and WNF succeeded in creating a broad platform for dialogue, in which governmental bodies, suppliers, and consumers participated. The idea behind the platform was that it would contribute to the initiation and growth of market demand for, and supply capacity of aviation biofuels. In line with this, on behalf of the KLM-WNF partnership, KLM closely followed new governmental regulatory incentives aimed at stimulating the market for aviation biofuels, also in addition to acting as a stakeholder in governmental policy development. As noted by the Program Manager of Public Affairs at KLM:

“My actions were twofold. First, they were aimed at making sure that biofuels were included in all kinds of incentive programs. If

you are not in the incentive program, you cannot apply. My role was to get biofuels in the incentive program. That is the most important one; making sure that the topic is included in the list of potential projects that can get funding. At the same time, you need to include the entire value chain. In this new business, you have many stakeholders. That is the second part: ensuring that the whole value chain was included in the discussion about biofuels.”

In 2011, KLM closed a “Green Deal” on biofuels with the Dutch Government. The Green Deal symbolized and concretized the efforts of the Dutch government to strengthen the position of aviation biofuels in the Netherlands. Governmental action aimed at creating synergy between the actions of KLM and the government in the stimulation of aviation biofuels. For example, as recounted by the Environmental Manager at KLM:

“The government promised us that they would incentivize aviation biofuels as a part of the Renewable Energy Directive (RED). That is a European measure for stimulating renewable energy. It currently applies only to road transport in Europe. In the Netherlands, however, there was an exception that also allowed it to cover aviation. Consequently, the price difference between biofuels and fossil fuels is leveled by credits.”

According to this deal, KLM performed demonstration flights on biofuels in an effort to increase the awareness and use of sustainable biofuels by other parties in the aviation industry. Furthermore, KLM committed to the development of sustainability standards along with RSB. Another outcome of the Green Deal between KLM and the Dutch government was the KLM Corporate Biofuel Program, which was launched in 2012.

4.4.2. *Microfoundation of reconfiguration II: setting industry sustainability standards*

During the partnership, KLM joined RSB, in collaboration with WNF, to ensure the sustainable quality of the feedstock that was used. The main criteria for selecting and approving different types of renewable feedstock were a substantial reduction in CO₂ emissions, minimal to no impact on biodiversity, and no competition with food production or the availability of food resources. Feedstock that met these RSB-criteria was labeled as “best in class” by WNF. In this regard, the primary strategy of WNF was to protect nature. In contrast, the strategy of KLM was to ensure market share and profit, while also contributing to the protection of nature. Accordingly, the goal of the partnership was to set new sustainability standards within the value chain. The CEO of SkyNRG explained the role of RSB in promoting a market for biofuels as follows:

“For us, biofuels were an option only if they did not have a negative impact on biodiversity, local development, and the local food supply. We did not want to backlash things. The biofuels were stimulated for sustainability reasons. We did need RSB to guarantee this. We could not check everything ourselves.”

The endeavor with the RSB was not an immediate success, as illustrated by the complaints of KLM representatives that the RSB certification system was relatively strict, and that a more flexible and realistic approach might be needed if KLM wanted to achieve a higher quantitative capacity of RSB-certified biofuels. In contrast, WNF was in favor of retaining the high standards, while also increasing the capacity of RSB-certified biofuels. At this point, the partners agreed that, although much had been accomplished, a new kind of partnership was needed in order to serve the individual sustainability strategies of the two organizations. In late August 2015, KLM and WNF terminated the second period of the partnership, and started a new type of collaboration: engagement without financial ties. This form of collaboration entailed a regular exchange of knowledge and expertise, combined with partnership in a mutual learning process in the area of environmental sustainability, with no further strings attached.

5. Discussion

5.1. *Learning capabilities*

Both of the partners had to expand and apply their learning capabilities in order to establish a partnership and profit from each other's complementary resources.

5.1.1. *Microfoundation of learning I: sensing strategic partners*

This case study demonstrates that both KLM and WNF relied on sensing capabilities in order to select the strategic partner with which to cooperate. Both of the partners aimed to find co-specialized resources in the partnership. This provided a foundation on which the two partners could evaluate and seize new opportunities for collaboration, in addition to helping them to recognize conflicting views. Comparing these findings to the literature, Dentoni et al. (2016) argue that sensing the ambition of prospective partners in a cross-sector partnership is crucial. The KLM-WNF case study confirms this argument, as it indicated that the shared ambitions of both partners kept the partnership going for consecutive years, although differences in ambitions finally generated a looser mode of cooperation. Consistent with these findings, Rondinelli and London (2003) report that possible conflict and distrust between prospective partners can also have a constricting effect on the formation and operation of partnership. In the KLM-WNF case, the sensing capabilities of the two parties helped both organizations to collaborate constructively for two four-year periods, based on shared ambitions and, of equal importance, based on knowing and respecting mutually conflicting ambitions.

5.1.2. *Microfoundation of learning II: co-specialization of resources*

The KLM-WNF case study reveals several examples of resources that an NGO can bring to a corporate-NGO partnership for ESI.

These resources include subject expertise and legitimacy provision. With regard to legitimacy provision, this case study indicates that the involvement of WNF with KLM in a partnership for ESI provides some assistance to KLM in its endeavor to gain credibility in the eyes of clients, customers, and governmental stakeholders. This empirical finding is consistent with those of a study by Lubik et al. (2013), which concludes that a partnership with an NGO provides new reputational resources to a business partner, in addition to improving the business partner's credibility in the area of environmental sustainability. The findings of the case study are also congruent with research findings by Dahan et al. (2010b), who report that, given the proven expertise and independent position that NGOs tend to have in the field of sustainability, their endorsements can have a significant positive impact on the credibility of ESI activities of a corporation.

5.2. Coordination capabilities

Both of the partners struggled to find a fit between each other's strategies, and they eventually found it by developing a joint strategy for the partnership.

5.2.1. Microfoundation of coordination I: fit between business model, vision, and strategy of partners

Previous research has concluded that it is of crucial importance for partners to synchronize their resources, strategies, and objectives within the partnership (Douma et al., 2000; Swoboda et al., 2011; Suurs and Hekkert, 2009). In this case study, the partners struggled to find a fit between their respective strategies. The ability of both partners to cooperate based on mutual interest, as well as on mutual respect for the individual interests of the other partner, appeared to be an essential capability in the KLM-WNF partnership as the partners struggled to find a common path and common ground. Despite their attempts, the two partners were unable to find and develop a strategic fit between their business models, visions, and strategies relating to ESI. They therefore sought and agreed on a fit between the strategies of each partner and the strategy of the partnership, with each party achieving a fit on different aspects. Although it did enable the existence of a strategic partnership, this construction could be typified as an indirect fit. In light of the argument by Day and Schoemaker (2016) that partnerships are guided by a shared strategic vision, which helps companies to adapt to fluid and uncertain circumstances, it can be noted that the indirect fit between the business models, visions and strategies of KLM and WNF made the partnership possible but also vulnerable.

5.2.2. Microfoundation of coordination II: integrated mission for the partnership

Together, KLM and WNF invested in and managed to develop a joint mission for the partnership for ESI. In this regard, Zahra and Nielsen (2002) contend that informal and formal coordination efforts by all partners are often needed in order to arrive at a shared understanding of what the partnership is expected to achieve. In the KLM-WNF case study, the partnership booked results based on the vision and mission of the partnership in the first and second period. However, the absence of a shared vision about a long-term direction ultimately led to the end of the formal partnership, which then became loose, informal, and non-financial. Research conducted by Joensuu et al. (2015) suggests another possible explanation for the vulnerability that emerged in this partnership. Referring to the organizational and social proximity of two partners, Joensuu et al. (2015) argue that close organizational and social proximity enables partners to adapt to each other's strategies in order to establish and operate a joint initiative. Such close proximity was absent in the KLM-WNF partnership. As the willingness of both parties to appreciate and overcome the strategic differences started to erode, there was no mechanism left to bind the parties together.

5.3. Reconfiguration capabilities

The KLM-WNF partnership initiated a niche market for aviation biofuels by fostering institutional dialogue and by developing new sustainability standards.

5.3.1. Microfoundation of reconfiguration I: fostering institutional dialogue

As described in the case study, KLM acted on behalf of the KLM-WNF partnership in the attempt to start a lobby aimed at convincing governmental actors and other stakeholders to create a level playing field for biofuels and fossil fuels. The partnership also involved various stakeholders in an institutional dialogue, the results of which included discussions with the government about legislation and regulation in favor of aviation biofuels. These findings are consistent with previous research arguing that the government serves a prominent function in establishing new codes of conduct and levels of performance with regard to environmental sustainability (Bossink, 2017, 2018; Brío and Junquera, 2003). In addition, previous studies have argued that legislation, regulation, and policy are among the most important factors in the formation of the market for ESI (e.g., Beise and Rennings, 2005; Hekkert et al., 2007; Schot and Geels, 2008). This was also found evident in the KLM-WNF case study. The two partners repeatedly indicated their willingness to comply with existing laws and regulations – even expressing a desire to go beyond compliance, where possible – and indicated their ambition to exert influence on the development of future laws and regulations in favor of aviation biofuels.

5.3.2. Microfoundation of reconfiguration II: setting industry sustainability standards

With regard to creating new sustainability standards, the KLM-WNF partnership invested in activities aimed at the labeling, certification, and standardization of sustainable biofuels. In the literature, the development of standardized labels has been identified as an important means of assuring and standardizing the quality of ESIs and of establishing these standards in the market (Bossink, 2015; Mlecnik et al., 2010). Baumeister and Onkila (2018) argue that energy eco-labeling in the aviation industry might function as a

potential driver for behavioral change, and create comparability in the market. The KLM-WNF partnership devoted considerable attention to this aspect by establishing RSB and by promoting and further developing RSB-certified biofuels for the market.

5.4. Contributions, limitations, and avenues for future research

This study applies the dynamic capabilities approach to study the KLM-WNF partnership for aviation biofuels. Accordingly, it suggests that the nature and the essence of this cross-sector partnership for ESI can be linked to and explained by an analysis of the dynamic capabilities of the partners. The results of this research can contribute to the further development of dynamic capabilities theory, which has traditionally and frequently been used to explain the transformation of intra-firm and inter-firm resources into new competencies that better match an organization to its environment (e.g., [Ettlie and Pavlou, 2006](#); [Pitelis and Teece, 2010](#)). This case study extends the application of dynamic capability theory to a cross-sector partnership for ESI. It illustrates that the value of the resources within a partnership evolves over time, and that it changes in response to the development of joint visions – albeit partially conflicting – strategies of the partners with regard to ESI. The findings of the case study further highlight the contingent nature of the dynamic capabilities of cross-sector partnerships for ESI.

The findings reported in this article are based on a single case, and they therefore have no statistical validity. The value of the case study findings is based on their analytical validity for comparable cases ([Yin, 2009](#)). This implies that the findings from the KLM-WNF case might also be observed in other, comparable corporate-NGO partnerships for ESI. Key aspects of this comparability include the following: a partnership between a single corporation and a single NGO; a multi-year cooperation; a formal, long-term partnership agreement; and an orientation toward ESI as the major goal of the partnership. These results point to several lessons that can be applied to comparable cases. First, the KLM-WNF case study illustrates that a direct fit – or an indirect fit if no direct fit is possible – between the strategic visions and long-term objectives of the cross-sector partners is important. This suggests that, before entering a partnership, managers from each of the partner organizations should assess the strategic fit with the other party. In addition, both parties should examine whether and to what extent synergy could be expected if a partnership were to be established. A second lesson is that ESI cannot be separated or isolated from economic aspects, given the involvement of a corporation in the partnership. Both partners should be open to and agree on all explicit evaluation criteria – environmental as well as economic – of the joint project early in the process of partnership formation. This is easier said than done. As indicated by the KLM-WNF case study, sustainability goals can be in conflict with economic goals, possibly even leading to the termination of the partnership. Sustainability is not a fixed, but a dynamic issue. Corporations and NGOs should prepare for and be able to engage in periodic negotiation and renegotiation concerning the terms, procedures, and goals of the partnership for ESI. Finally, and related to this point, a corporate-NGO partnership for ESI should have a suitable and viable joint strategy and business model. This model can then serve as a reference point for coordinating the partnership and its outcomes.

Although this study provides new insights into corporate-NGO partnerships for ESI, it is also subject to a number of limitations. First, the findings and insights in this study might be valid for comparable cases, but there is no guarantee that this will be the case. To this end, further multiple-case study research is necessary – not only for comparable cases, but for divergent cases as well – in order to generate findings with a deeper and broader analytically valid scope. Second, the retrospective design of this case study is bound to existing data and the memories of interviewees. It implies a lack of worthwhile data that could have been collected through real-time observations or other means. Future research could be designed in the form of a real-time, longitudinal case study or set of case studies, thereby revealing additional insights into the dynamic nature and essence of corporate-NGO partnerships for ESI. Finally, this research is based on dynamic capabilities theory as a lens through which to examine an empirical phenomenon. The adoption of another theoretical lens might generate different findings, which could also be of interest for, add to, or even neutralize and contradict the findings of this study. In this regard, future research could be designed to investigate corporate-NGO partnerships from other angles. For example, the institutional entrepreneurship perspective ([Maguire et al., 2004](#)) refers to the “activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” ([Maguire et al., 2004](#): 657). This perspective could shed more light on how stakeholders in a corporate-NGO partnership develop new institutions in favor of the partnership for ESI.

6. Conclusion

This research comprises an in-depth, longitudinal case study of a corporate-NGO partnership for ESI, with both partners, KLM and WNF, working together to develop and promote a market for sustainable aviation biofuels, thereby reducing CO₂ emissions. Using the dynamic capabilities approach as a theoretical lens, the findings reveal that both of the partners used learning, coordination, and reconfiguration capabilities to initiate and develop a niche market for aviation biofuels. Two microfoundations were identified for each of these dynamic capabilities. The microfoundations for learning are the sensing of strategic partners, and the co-specialization of resources. The microfoundations for coordination are finding a strategic fit between partners and having an integrated mission. Finally, the microfoundations for reconfiguration are fostering an institutional dialogue and setting new industry standards.

Two key lessons that can be drawn from these findings could be helpful for building cross-sector partnerships for ESI. First, the study highlights the importance of finding a direct or indirect fit between the strategic vision and the long-term objectives of the corporation and the NGO aspiring to be partners. Second, given the dynamic nature of sustainability, corporations and NGOs should agree on the specific economic and environmental evaluation criteria for ESI early in the process of forming the partnership. The lessons drawn from this study do not include any all-encompassing success factors, strict action guidelines, or golden rules. This is due to the research design, which was based on a single case study rooted in the relatively modest ambitions of the partnership being

investigated. The corporate-NGO partnership in this study focused on only a small fraction of the activities of the business partner. The partnership set an aspirational target to use an average of 1 % sustainable biofuels and targeted a niche market, in the apparent absence of a large-scale market. Future research should therefore investigate how corporate-NGO partnerships can opt for ESI projects with greater ambitions, in addition to examining the types of corporate-NGO partnerships that could be effective in expanding niche markets. Another avenue for research could involve enhancing an understanding concerning the strategies that corporations and NGOs use to cope with the challenges arising from the contrasting demands of developing and implementing ESIs while also aiming to protect, control, and increase the turnover and profits of businesses.

Declaration of Competing Interest

None.

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