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Article

The Relationship of Organisational Value Frames with the Configuration of Alliance Portfolios: Cases from Electricity Utilities in Great Britain

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Abstract: Increasing concerns over global and local sustainability issues motivate businesses to develop solutions via collaborative partnerships. While many studies explain the contributions of sustainable alliances to economic, environmental, and social sustainability, less is known about how a portfolio of these alliances is configured. This study aims to answer this question by examining the relationship between organisational value frames and alliance portfolio configurations of 16 utility companies in the electricity industry of Great Britain. The study finds that organisational value frames play a key role in the selection of alliance partners and hence the configuration of alliance portfolios. The results demonstrate that British electricity utilities often collaborate with cognitively similar organisations. The results demonstrate that cognitive homophily is common in selecting partners to tackle sustainability issues. While previous studies demonstrated homophily in partner selection as resource homophily or status homophily, in the sustainability context, this study shows that homophily is also about values that guide interpretations of sustainability issues.

Keywords: organisational cognition; organisational value frames; sustainability; sustainable collaboration; sustainable alliance portfolio; configuration of alliance portfolios; electric utilities

1. Introduction

The systemic, complex, and technical nature of sustainability problems motivates businesses to form various collaborative arrangements that address different sustainability issues [1–6]. Sustainable alliance partners include “customers, suppliers, other companies outside the supply chain, universities and research institutions, non-governmental organisations, and governmental agencies” [7]. A recent review on sustainable alliances suggests that this literature is fragmented based on the type of partner (e.g., NGO, business, government, or research) or the type of sustainability issue (e.g., climate action, sustainable food production, sustainable cities or communities) [8]. Often due to this fragmentation, prior studies take a single type of alliance as a unit of analysis [8]. While this led to accumulated knowledge on the different types of alliances and their contribution to sustainable development, less is known about the aggregate of a firm’s collaborative arrangements that address these sustainability issues, i.e., the sustainable alliance portfolio of a firm [8].

There are significant differences in the sustainable alliance portfolios of firms, however, to date there have not been many studies to demonstrate why firms engage with different types of partners and why they prioritise some sustainability issues over others [8]. As Wassmer (2010, p. 141) puts it, “most firms are engaged in multiple simultaneous strategic alliances with different partners and are facing the challenge to manage an entire alliance portfolio” [9]. Alliance portfolios are sources of learning for firms as they contain partners from different organisational backgrounds, such as governments and NGOs that may challenge the focal firm’s norms and practices [10]. Therefore,

studying alliance portfolios, as opposed to alliance dyads has the potential to demonstrate how alliance portfolios are shaped and how they can be managed in a way to leverage the learning amongst different partners in a portfolio. In the sustainability context, what makes alliance portfolios even more interesting and challenging is the fact that sustainability partners of focal firms often demonstrate different ways of thinking about sustainability issues [11,12]. To address these differences between organisations regarding how they think about sustainability, the concept of organisational value frames is a helpful construct.

Organisational value frames guide the interpretation of sustainability issues at the organisational level [13]. Organisational value frames reflect on cognitive orientations of organisations and how they interpret the world around themselves [14]. While cognitive frames determine how individuals interpret issues that are based on their previous experiences, organisational value frames are the outcomes of contests between individuals' cognitive frames [15]. These frames impact the development of different types of business models and organisational forms [16]. These frames also impact how an organisation acts when it comes to pressing sustainability challenges; while some may develop a more proactive approach, others may be more reactive [17–19]. Engaging with a diverse set of stakeholders and partners for sustainability issues is an indicator of firms' proactivity regarding sustainability [5,20]. Therefore, it can be argued that the organisational value frame of a firm impacts its sustainable alliance portfolio, the choices of its alliance partners and the sustainability issues that they specifically address. This study answers how the organisational value frame affects the configuration of an alliance portfolio of a focal firm.

To tackle this research question, it is necessary to examine an industry challenged by a diverse set of sustainability issues, pluralistic in terms of the cognitive orientations and collaboration tendencies of its actors. Electricity utilities are very important in delivering the sustainable development goals (SDGs), such as: climate action (SDG 13); affordable and clean energy (SDG 7); sustainable cities and communities (SDG 11); industry, innovation, and infrastructure (SDG 9); reduced inequalities (SDG 10); and, gender equality (SDG 5) [21]. Electricity utilities in Great Britain provide a pluralistic context regarding organisational value frames due to the variety of actors in the sector. Since the liberalisation of the British electricity market in the 1990s, utilities with different business models have entered the market [22]. These new entrants may be environmental non-profit organisations, community-led groups and co-operatives, local governments, or social enterprises [23–25]. The incumbents of the industry, the Big Six (British Gas, EDF, E. ON, Npower, SSE, and Scottish Power), develop capabilities in generating electricity from renewable and sustainable technologies [26]. The new players, on the other hand, push green or social agendas by sourcing 100% from renewables and advocating for the sustainable development goal (SDG 7), affordable and clean energy. The significant difference between the newcomers and incumbents exists in their business models and their approach to value creation. According to Laasch [16], it is the organisational value frames that lead to differences in business models and approaches to value creation. Therefore, the electricity utilities in Great Britain present a pluralistic industry in terms of organisational value frames.

In addition, trends, such as decarbonization, decentralisation, and digitisation also challenge these utilities to transform themselves into more sustainable organisations. PricewaterhouseCoopers (PwC) suggests “numerous utilities will find it difficult . . . especially if they try to build all the requisite capabilities to scale on their own” [27]. In sum, this sector is characterised by resource constraints due to changing institutional norms, technologies and trends. These resource constraints are likely to motivate utilities to build collaborative solutions for sustainability as opposed to building solutions in-house. Existing studies report that electric utilities collaborate with suppliers of renewable energy technology, project developers, other utilities, and various other actors [28,29]. Utilities benefit from the know-how of external stakeholders such as universities, suppliers, research centres, or NGOs, ranging from research projects to equity joint ventures [28,29]. Therefore, British electricity utilities also provide a feasible context to study alliance portfolios; and alliance portfolio and organisational value frame relationships.

16 utility companies are analysed as exploratory cases to study this relationship between cognitive frames and sustainable alliance portfolios. The results show that, depending on different organisational value frames of the focal companies, the partnership diversity in the portfolio, and hence the portfolio configuration, changes. Findings suggest that utilities prefer to collaborate with cognitively similar organisations to develop solutions for sustainability issues that they both prioritise. Previous studies have explained this through the concept of “cognitive homophily”. However, these studies have mostly demonstrated cognitive homophily as status homophily, resource homophily, or technological homophily [30,31]. In the context of sustainability, the results show that the cognitive homophily principle applies. However, different from most other studies in strategic alliance literature, in a sustainability context the homophily is about the perceived similarities of organisational value frames that guide sustainability interpretations.

This study contributes to the literature on strategic alliances by demonstrating how homophily based on organisational value frames impacts alliance portfolio configurations. It also contributes to the conversation on the literature on sustainable alliances. This literature, thus far, has demonstrated that to achieve their sustainability targets, for-profit firms work with diverse sets of organisations that are significantly different from themselves, which is often perceived as a source of organisational learning [4,5,32]. This study demonstrates that the extent of this diversity in the alliance portfolio is dependent on the organisational value frames. The results also enable sustainability and stakeholder engagement practitioners in the electric utility sector to build an understanding of the practices regarding sustainable alliances and sustainable alliance portfolios.

The remainder of this paper is organised as follows. The theory section summarises the typologies of organisational value frames in a sustainability context, draws on alliance portfolio literature, and explains the notion of the “sustainable alliance portfolio”. The methods section explains how cases are selected and the data is analysed. The results section introduces the organisational value frames and sustainable alliance portfolios of selected cases. The discussion section analyses the relationship between organisational value frames and sustainable alliance portfolios, and it builds propositions based on findings. Finally, in the conclusion section, the contribution of the study and paths for future research are summarised.

2. Theory

2.1. Organisational Value Frames for Sustainability

Cognitive frames are constructs that provide individuals with a lens to understand a situation [33]. The content of a cognitive frame demonstrates the knowledge, assumptions, and beliefs that guide the interpretation of a situation, while their structure is about how this content is connected [34]. Cognitive frames of individuals “create a context for complex behavioural responses” by guiding them to “process information and to engage in learning that helps facilitate innovation” [35]. While cognitive frames are constructs at the individual level, institutional logics are constructs that play a role at the societal level. Institutional logics are defined as “the socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality” [36–38].

The seminal review of Cornelissen and Werner [14] on frames and framing and the seminal review of Walsh [39] on managerial and organisational cognition highlight that the societal level institutional logics and the individual-level cognitive frames impact the organisational-level value frames. Kaplan shows that organisational value frames are an outcome of the negotiations between individuals with different cognitive frames in the organisation and Kaplan calls this process “framing contests” [15,40]. Laasch, on the other hand, argues that different institutional logics may impact the development of organisational value frames, which explains how some organisations demonstrate heterogenous institutional logics. Based on these, I take organisational value frames as the outcome of the interplay between institutional logics at the societal level and the cognitive frames of individuals.

I take organisational value frames as the result of the competing frames in the organisation and join Daft and Weick [41] in viewing the organisation as a system of interpretation and join Nooteboom [42] by applying the cognitive theory of the firm in the sustainability context.

Referring to frames in the context of social movements, Zald [43] demonstrates that frames are contested and debated continuously as alternative visions from within an organisation and that external actors, such as the government, impact the frames of an organisation. Zald [43] also demonstrates that organisational value frames, through processes of “framing”, lead to the development of more symbolic frames. In this paper, I make a difference between the two. While organisational value frames are related to the dominant frame in the organisation, that is an outcome of the social and political processes within the organisation; symbolic frames are those that represent the organisational value frames to the larger societal audience [43]. As Scott [44] puts it; “... the shared conceptions that constitute the nature of social reality provide symbolic frames that support social sense-making”. In this study, I take symbolic frames as the representations of organisational value frames. Therefore, while organisational value frames are the outcome of meaning in the organisation level, the symbolic frames are the outcome of framing processes to convey the message of organisational value frames [44]. Organisational value frames elicit themselves as symbolic frames when organisations (as framers) purposefully and strategically communicate their way of thinking with an external audience [45].

Laasch demonstrates that organisational value frames determine the business model: how and what type of value is created and captured by a firm [16]. While organisational value frames impact different organisational outcomes, such as value creation and capture processes, recently scholars also emphasise that organisational value frames impact the formation and management of sustainable alliances [13]. This study takes a similar approach. To demonstrate the difference between the interpretation systems of various organisations in a sustainability context, I introduce the following organisational value frames: business frames, business case frames, environmental frames, social frames, and paradoxical frames [18,34,46,47].

The business frame is defined as shared beliefs in an organisation that are focused on economic goals [18]. Business frame motivates the members of the organisation to focus on growth and financial metrics such as profit and loss [18]. Organisations with a business frame may perceive sustainability initiatives as a cost [48]. The business frame is associated with short-termism [49] and shareholder value [50]. To sum up, organisations with a business frame prioritise the economic aspects of sustainability, the survival of the company, the demands of shareholders, and the value they need to create for them. The structure of business frames does not connect or integrate economic goals with environmental and social goals.

The business case frame aligns social or environmental objectives with economic ones [46,47]. In comparison to the business frame, the business case frame tries to accommodate different objectives, however prioritises economic objectives over others [34,51]. Organisations with a business case frame view sustainability as a means of risk reduction, efficiency gains, brand building, or new market creation opportunities [47]. While some are skeptical about organisations with this frame for prioritising economic gains over environmental or social [19,34,49,52,53], others highlight that it offers pragmatic solutions, clear guidance on which issues to prioritise, and how to solve them [34].

To sum up, organisations with a business case frame prioritise the economic aspects of sustainability, framing environmental and social sustainability as economic opportunities. The structure of the business case frame integrates economic and environmental or social frames, however only using an alignment logic. Organisations with this frame only integrate environmental and social issues that benefit economic sustainability.

The environmental frame demonstrates an ethical responsibility towards nature and going beyond compliance for the environment [48]. Organisations with an environmental frame perceive environmental issues as systemic issues and prioritise the environment’s carrying capacity [46,54]. These organisations are aware of different environmental issues, such as biodiversity, land use and deforestation, or climate change, and do not view these as separate, but as interconnected issues [55].

They aim to protect the health of the ecosystem for its own sake and not for its contribution to human systems [55]. Environmental frames are associated with long termism and ecological value [49,52]. The structure of the environmental frame prioritises environmental issues over other issues, and in the case of tensions, organisations with this frame put the natural environment as a priority to protect and preserve.

The social frame demonstrates a responsibility towards internal and external stakeholders, the prioritization of global justice, and fairness [46,56,57]. Organisations with a social frame put human systems and society at the centre of their decision-making, and view the non-human world as a system that humans are dependent on [53,55]. They view societal problems, such as poverty, health, and equality as global problems in addition to global environmental problems, and they address these issues through global networks [56]. While the social frame aims to preserve nature, the motivation is to sustain human life as opposed to sustaining nature for its own sake [55]. They engage with technological optimism for solutions for societal and environmental problems [55,58]. Therefore, they have a belief system that supports viewing technological innovations as a contribution to human well-being, health, and prosperity [49,59]. Organisations with a social frame prioritise societal issues and believe that nature should be cared for to sustain human life on earth. Therefore, the structure of the social frame integrates environmental and social issues, however the natural environment is viewed as an external constraint for human survival and sustainability.

The paradoxical (or hybrid) frames demonstrate recognition and acceptance of the simultaneous existence of contradictory forces when it comes to the firm's relationship with the natural, social, and economic environment [34]. Paradoxical frames create awareness of multiple and conflicting economic, environmental, and social aspects of sustainability issues, and hence, rather than perceiving tensions as trade-offs, organisations are more comprehensive and integrative when dealing with these issues [18,34,60]. Organisations with a paradoxical frame listen to the voice of stakeholders to gain knowledge about problems that they have limited knowledge on [18]. Their opinions on contradictory forces are not in fierce competition but rather in symbiosis [48]. Therefore, as opposed to viewing one frame as more central and another frame more peripheral [48,57], they feel both frames as central and blended. Environmental and business frames may peacefully co-exist in corporate sustainability divisions of companies [48]. Organisations with this frame embrace both temporal and spatial tensions [34,49,52]. While the business case frame aligns objectives, albeit prioritising financial objectives over others, paradoxical frames do not align but connect different objectives by synthesising them creatively. They balance short term and long-term demands often by developing different projects to satisfy both. The structure of the paradoxical frame integrates environmental, social, and economic issues, and hence organisations with this frame are characterised with the inter-connectedness in their statements about sustainability.

2.2. Sustainable Alliance Portfolios and Their Configuration

An alliance portfolio is the aggregate of all strategic alliances of a focal firm [9]. Strategic alliances are voluntary arrangements involving exchange, sharing, or co-development of new products and technologies [61]. However, when it comes to collaboration for sustainability, firms do not only interact with other firms to co-develop new products, share knowledge, and risk. Firms also interact with other actors, such as NGOs, governments, or universities to develop sustainable solutions, legitimise existing sustainable technologies, build standards, lobby for environmental or social improvements, and co-provide environmental or social services [1,3–5,62,63]. Therefore, it is necessary to develop a definition of a sustainable alliance portfolio. I define sustainable alliance portfolio of a focal firm as “the collection of all its alliances with an objective to contribute to sustainability issues”.

The literature on alliance portfolios suggests that important characteristics of alliance portfolio configuration are the portfolio size and the portfolio diversity [9]. The size of an alliance portfolio is the total number of interactions a focal firm has that it manages simultaneously during a particular time frame [9]. While some studies argue that portfolio size is an important determinant of successful

alliance management, others argue that it is the diversity of partners that matter [9]. In this study, I take a similar approach and aim to assess partner diversity in sustainable alliance portfolios.

The diversity of the alliance portfolio is explained in different ways in the literature. An important study of portfolio diversity is that of Jiang, et al. [64]. They introduce several types of portfolio diversity; including, national diversity, industry diversity, functional diversity, organisational diversity, or governance diversity. In this study, to understand the cognitive diversity of a focal firm's alliance portfolio, I study the organisational diversity. According to Jiang "alliances can be formed between large multidivisional firms, between public and private firms, and between for-profit businesses and not-for-profit organisations such as universities and government agencies". Since different organisations provide different resources and capabilities, the diversity of organisations increases "breadth of search, learning capabilities, and resource access thereby reducing the threat of core rigidities" [64].

A sustainable alliance portfolio consists of alliances that address different sustainable development goals with four different categories of partners: other firms (inter-firm), NGOs, research institutions, and governments [8,20,63–65]. In this study, I take the organisational diversity of a portfolio as the source of organisational value diversity that the focal firm needs to manage.

Inter-firm alliances are those that occur between firms, including suppliers, customers, competitors, and other companies with environmental or social and economic objectives [8]. Some of the inter-firm alliances for sustainability are considered in sustainable supply chain literature, as "creating coordinated supply chains through [the] voluntary integration of environmental, social, and economic aspects" [66–68]. However, not all inter-firm alliances for sustainable development occur between supply chain partners. Some of these may occur between partners from different sectors to co-develop technological innovations to tackle social and environmental problems [1]. The recent study of Cygler et al. (2018) demonstrates that firms may even partner with competitors to tackle sustainability challenges, in the form of co-opetition [6]. These co-opetitive partnerships can develop sustainable business practices [6].

Firm-NGO alliances are voluntary formal or informal collaborative arrangements between firms and NGOs concerning a broad range of social and environmental issues [8,69]. NGOs play an important role for "initiating, convening, bridging, and coordinating different actors into a social change process" [70]. NGOs facilitate corporate change not only through advocacy, but also by providing expertise to their partners from the private sector [70]. Businesses collaborate with NGOs not only to get access to their resources, but also to demonstrate to their consumers the genuineness of their environmental and social claims [65].

Firm-research alliances are agreements between firms and public or private research institutions to emphasise collaboration for research and development, sustainability training, and sustainability consultation [8]. According to Orecchini et al., firms engage with research institutions to solve technical problems that they face regarding sustainability issues, to co-develop sustainable products, to engage in collaborative research for sustainability, and to access new research via seminars and workshops [71]. For instance, universities' partnerships with local and regional organisations contribute effectively to the transition towards sustainability [72].

Firm-government alliances are arrangements between firms and regulators that demonstrate a commitment to the environmental and the social sustainability agendas [8,73] and aim to influence public policy [8]. Government partners may involve regulatory bodies at a local, regional, and national scale. Aside from governments, firms engage with different community groups and offer them charitable donations, training, and other means of support [74]. These communities, groups of citizens drawn together by geography, interaction, or identity, can address issues that are related to their shared well-being by engaging with a local business [74].

2.3. The Role of Organisational Value Frames in Sustainable Alliance Portfolios

The organisational value frame of a focal firm is essential when studying alliance portfolios, because these frames play a critical role during the birth, life, and death of alliances [75]. Organisations' value frames impact the following processes: selection of partners, managing relationships and differences with partner organisations, learning from partner organisations, building shared goals, development of mutual trust and commitment, and managing alliance performance throughout the alliance life cycle [76]. For instance, the selection of alliance partners largely depends on the perceived compatibility of organisational value frames [77].

To generate learning and innovation in alliances, Nooteboom suggests that "for organisations to achieve a common purpose, people do not have to agree on personal goals; however, they need to share certain basic perceptions and values to sufficiently align their competencies and motives" [78]. It is these fundamental perceptions and values that constitute the organisational value frames that make an organisation distinct, and therefore influence their choices in forming and terminating alliances. The formation of new alliances and termination of existing alliances are how an alliance portfolio is configured. Therefore, organisational value frames are expected to impact the configuration of sustainable alliance portfolios.

Organisational value frames are especially critical in studying sustainable alliance portfolios. Hahn and Aragon-Correa highlight that "a higher cognitive diversity inside the organisation enhances creativity and innovative responses" for sustainability [19]. These frames are embedded in existing routines and structures, and they develop path-dependently through the accumulation of prior experiences. Hence, cognitive frames also entail cognitive limitations [42]. To overcome these cognitive limitations within the organisation and create solutions to sustainability problems, firms build diverse stakeholder relationships in their sustainable alliance portfolio. Firms that can accommodate various organisational value frames are more likely to build diverse alliance portfolios and interact with different types of partners for a diverse set of sustainability issues [78,79].

Lin hypothesises that firms that engage with diverse alliance partners, hence the cognitive diversity of sustainable alliance portfolios, are associated with more proactive strategies towards sustainable development [3]. Others suggest that a diversity of partners "enable wider access to local resources such as information, knowledge, skilled labour, and finance, eventually increasing innovation" [80]. In summary, as firms view sustainability issues through their organisational value frames, it is reasonable to argue that firms would also form different types of alliances addressing different sustainability issues. Therefore, in sum, I argue that the types of partners that a focal firm chooses to work with and the issues that a focal firm highlights in their sustainable alliance portfolio is an outcome of their organisational value frames.

3. Methods

Multiple case study design is appropriate to explore firms' organisational value frames and their relationship with the configuration of sustainable alliance portfolios. Following a similar approach to Foestl [81], a multiple case study design is well-suited for this study for several reasons. First, research on how firms build their sustainable alliance portfolios is in an exploratory stage [8]. Second, organisational value frames and sustainable alliance portfolios are complex phenomena that require multiple sources of information [81]. Third, context plays a crucial role in shaping organisational value frames and building sustainable alliances, and case study research is appropriate for studying a phenomenon in a particular context [82]. Therefore, I follow these steps that were identified by Eisenhardt [83]: designing research questions and constructs, the case study selection, instrument and protocol design, data collection, data analysis, shaping propositions, and reaching closure. In this section, I explain the case study selection and protocol design.

Cases are selected based on the size of sustainable alliance portfolios and the organisational value frames of electricity utilities. The electricity utilities are selected from Great Britain. British electricity utilities provide a suitable context, as it is discussed in the introduction. As I take a portfolio approach,

meaning to take the firm as the unit of analysis, the first step is to identify who the market players are. The most reliable source to determine the market players is OFGEM, the government regulator for the electricity and downstream natural gas markets in Great Britain. I first go through the publications and reports of OFGEM. OFGEM provides up-to-date lists of all market players in the electricity supply sector. Based on the most recent report of OFGEM, there are 197 licensees in the category of domestic electricity supply in 2018 [84]. These 197 licensees constitute potential cases for this study.

The second step is to select appropriate cases from the 197 licensees. This step is about the identification of cases with reasonably sized sustainable alliance portfolios. Based on the literature on strategic alliances, secondary data about sustainable alliance portfolios is collected from sources, including press releases, news, and other articles in trade journals and web pages [62,85]. In different studies about alliance portfolios, alliance portfolio size may vary from 2 to 350 [64,86]. While some of these alliances may be related to sustainability, these represent alliance portfolios in general that may constitute any collaborative engagement with other organisations. In selecting the cases, an important criterion is portfolio size. This is because the objective of the study is to understand the diversity of different organisations that a focal firm partners with, to explain the cognitive diversity of a sustainable alliance portfolio (business, NGOs, research and government, council, and communities). Therefore, secondary data is collected about each of the 197 licensees and their sustainable alliance portfolios. While most of the licensees have no sustainable alliances reported, 22 utilities had less than 10 alliances in their portfolio and 16 utilities have more than 10 sustainable alliances in their portfolio. In this study, those 16 utilities with 10 or more alliances in their sustainable alliance portfolio (portfolio size is 10 and/or greater than 10) are selected as case study organisations.

The third step is to collect data about the organisational value frames of these 16 utilities. Following the literature on organisational value frames and cognitive frames, documents such as mission statements, annual reports, corporate sustainability reports, CEO statements, and sustainability web pages provide evidence about how these organisations express their interpretation of sustainability issues, and hence their organisational value frames for sustainability [40,87,88]. It can be argued that these documents demonstrate the symbolic frames and not the organisational value frames. However, as I expanded in the theory section, the symbolic frames are not separate from organisational value frames; they are how these organisational value frames are conveyed for the external audience through processes of framing [43]. In addition, organisational value frames develop through on-going debates and political processes of “whose frame is going to win”. Therefore, to observe organisational value frames and their formation directly would require a significant amount of observations. However, how these organisational value frames are formed is not the objective of this study. The objective of this study is to demonstrate their impact on sustainable alliance portfolios. Therefore, I use the secondary data sources that are available to understand the “symbolic frames”, which can be used as a proxy of “organisational value frames”. The data collected is based on the firms’ own disclosure and statements, therefore, it is appropriate to study the organisational level phenomenon using the data disclosed by case study organisations [34].

Table 1 summarises the amount of data that was collected for the analysis. This data is coded using structural coding [89]. Structural coding is used for pre-defined themes outlined in the theory section [89]. The themes that arise from structural coding are typologies of organisational value frames for sustainability (business, business case, environmental, social, and paradoxical frames) and typology of partners in sustainable alliance portfolios (business, NGO, research, government or councils, and communities). Table 2 demonstrates the keywords associated with different organisational value frames that are used in structural coding.

Table 1. Summary of Collected Data.

	# of Documents Evaluated to Assess Cognition	# of Documents Evaluated to Assess Sustainable Alliance Portfolio
British Gas	4	42
Co-operative Energy	3	18
E.ON	4	116
Ecotricity	3	136
EDF Energy	3	150
Eneco Energy	6	17
Engie	3	90
Good Energy	3	38
Mongoose Energy	5	13
Npower	5	105
Opus Energy (Drax)	3	13
Our Power Energy	3	11
Ovo Energy	2	102
Robin Hood Energy	2	52
Scottish Power	3	73
SSE	3	37
Total	55	1013

Table 2. Keywords used in Coding Organisational Value Frames.

	Keywords	Reference
Business Frame	Economic goals, financial metrics such as profit, sustainability as a cost, shareholder value	[18,48,49,52,90]
Business Case Frame	Sustainability for risk reduction, efficiency gains, brand building or new market creation opportunities, sustainability for economic gains	[19,34,49,52,53]
Environmental Frame	Ethical responsibility towards nature, emphasis on nature's carrying capacity, emphasis on climate change, land use, biodiversity, deforestation, ecological value, natural environment as a priority	[46,49,52,54]
Social Frame	Global justice, equality and fairness, society at the centre of their decision-making, humans are dependent on nature, emphasis on issues such as poverty, health and equality	[46,53,55–59]
Paradoxical Frame	Awareness of multiple and conflicting economic, environmental, and social aspects of sustainability issues, viewing these issues inter-connected, strategies to balance and synthesise conflicting but inter-connected issues	[18,34,49,51,52,60,90]

4. Results

This section summarises the findings of the organisational value frames and sustainable alliance portfolios of British electricity utilities.

4.1. Organisational Value Frames of Case Study Organisations

In this section, the organisational value frames of case study organisations are introduced. Table 3 summarises the organisational value frames of case study companies, based on the symbolic frames that were identified in the secondary data. This table shows that half of the case study organisations communicate that they interpret sustainability issues with a business case frame, followed by four utilities with a social frame, one with an environmental frame, and three with a paradoxical frame. None of the case study organisations demonstrates solely a business frame, which may be due to the sectoral choice. The electricity sector is a sector where legislation is critical in the transition to a low carbon economy, and different policy instruments are used to motivate market players to move towards green energy and sustainable practices [91]. Therefore, it is likely that some of these companies are moving from a business frame to business case frame or other frames.

Table 3. Organisational Value Frames of Case Study Organisations.

	Frames	Statement	Source
British Gas	Business Case	"Making financial sense of sustainable visions . . . It costs nothing to turn off the lights. Yet Tesco estimates that, along with other small changes to staff routines, flicking off that switch could save £6 m a year. Even for the UK's largest retailer, this is not a trivial sum."	[92]
Co-operative Energy	Social	"...striving to be a successful consumer cooperative working towards creating a better, fairer world and to enhance the lives of our colleagues, members, customers, and the communities we serve."	[93]
E. ON	Business Case	"We want to aim high when it comes to business success—but only in harmony with natural resources, the global climate, and our corporate responsibility."	[94]
Ecotricity	Environmental	" . . . in any apparent conflict between the environment and money—we put the environment first. We take into account ethical and social issues, biodiversity and sustainability when making all strategic and operational decisions."	[95]
EDF Energy	Business Case	"Drive progress for people—a successful and responsible long-term energy business trusted by customers and powering a thriving society and a healthy environment."	[96]
Eneco Energy	Paradoxical	"Everyone's sustainable energy. Instead of sustainable energy for everyone. Our ambition is to bring our own energy consumption and that of our customers within the planet's limits, to ensure that our planet remains liveable in the years ahead. Not only for ourselves, but also for future generations." "Trust is one of the most important reasons for people to choose a certain brand. In addition, market research has shown that people would rather pay a lower price for their energy supply than choose the sustainable option. We are showing that a combination of the two is possible. You get the opportunity to save energy, use sustainable energy and generate energy yourself, all while paying a competitive price."	[97,98]
Engie	Business Case	"[Engie] has achieved far more than just creating value for the company. Behind [Engie's] transformation lies a desire to shift to another type of development, guided by the pursuit of more harmonious progress."	[99]
Good Energy	Paradoxical	"Founded in 1999, our mission at Good Energy is to transform the UK energy market by helping homes and businesses to be part of a sustainable solution to climate change." "Our strategy centres on building on our success, developing the long-term profitability of Good Energy, and investing in the future as an integrated green energy services company."	[100,101]
Mongoose Energy	Social	"Our mission is to change the nature of energy ownership in the UK and put people at the heart of it. We are majority owned by the community energy groups we work with. Mongoose brings together local people and commercial developers to identify, develop, finance, build and manage community-owned, clean energy projects."	[102]
Npower	Business Case	" . . . adopting an integrated energy strategy not only supports sustainability objectives, but it can also save considerable sums of money. Among the many businesses we work with, cutting costs in the region of 20% are common place."	[103]
Opus Energy (Drax)	Business Case	"By being more sustainable, you can actually save money, and I think that is really critical to businesses," says Jonathan [Jonathan Kini-the CEO of Drax Retail]. . . . The energy sector itself, let's be honest, has been quite confusing for businesses and there's a certain sort of opaqueness." "We are making strong progress while creating value for our shareholders and stakeholders over the long term, investing in research and innovation, providing jobs and sustainable business growth in the years to come."	[104,105]
Our Power Energy	Social	"Our Power is a UK not-for-profit energy supplier set up to provide customers with a fairer way to buy the energy they need. Our mission is to make household energy more affordable and greener for all energy customers while helping those who are at risk of fuel poverty or on lower incomes."	[106]
Ovo Energy	Paradoxical	"In 2009 we set out to become an energy company that would put people and the planet first; driven by the belief that there is a better way. We have focused on creating the energy system of the future—a future that is going to be defined by renewable energy...how to blaze a new "mainstream green" energy path, while scaling-up and establishing [Ovo] as a significant player in the UK retail energy sector."	[107,108]
Robin Hood Energy	Social	"...to tackle fuel poverty and to help give people a cheaper, more helpful alternative to the Big Six." "We are a not-for-profit company, so we can keep our prices low and competitive. We do not have private shareholders watching our every move, or big bonuses for our company directors. Instead, we have one simple aim—to bring you cheaper gas and electricity."	[109]
Scottish Power	Business Case	"We are committed to doing business responsibly, in order to achieve sustainable growth and to protect and enhance the reputation of Scottish Power and the wider Iberdrola Group in the UK."	[110]
SSE	Business Case	"...recognising that there are business risks associated with a failure, both nationally and internationally, to meet stated carbon reduction ambitions. If failure becomes apparent in the medium term, the likelihood of a less orderly policy and market response may in itself pose further business risks."	[111]

4.1.1. Utilities with a Business Case Frame

The utilities with a business case frame are British Gas, E. ON, EDF, Engie, Npower, Opus Energy (Drax), Scottish Power, and SSE. Utilities in this category demonstrate a commitment to social and environmental sustainability issues. However, they often justify this commitment as a source of branding and reputation, cost reduction, risk reduction, value creation, the source of profitability, and long-term business sustainability. For instance, British Gas highlights sustainability as a source of value creation and highlights the path from “sustainability to profitability” to its business customers [92]. Npower and Opus Energy highlight that energy efficiency initiatives reduce not only the environmental costs, but also energy costs of their business customers. EDF and Engie underline the role of people and progress and long-term business sustainability. Scottish Power suggests that commitment to becoming a sustainable business leads to enhanced reputations. In their response to stakeholders after the Paris Agreement, SSE demonstrates how they mitigate challenges that are posed by climate change “recognising that there are business risks associated with a failure, both nationally and internationally, to meet stated carbon reduction ambitions [111]. The CEO of E. ON, Johannes Teysen, highlights the transformation of the energy sector, and he suggests that “E. ON will tap the growth potential created by the transformation of the energy world.” [112]. To sum up, what these companies have in common is their belief in the importance of environmental and social sustainability for long term business sustainability.

4.1.2. Utilities with an Environmental Frame

There is only one utility identified solely with an environmental frame: Ecotricity. Ecotricity, an important green challenger in the UK that supplies only renewable energy, demonstrates a commitment especially to environmental sustainability issues, such as climate change and biodiversity. Ecotricity has a mission “to bring about environmental improvement by changing the way energy is made and used in the UK” [95]. In their purpose statement, they refer to the possibility of tensions between environmental and business frames by identifying that “in any apparent conflict between the environment and money—we put the environment first.” [95]. This shows that Ecotricity prioritises environmental sustainability over economic sustainability.

4.1.3. Utilities with a Social Frame

The utilities that were identified with a social frame are Co-operative Energy, Mongoose Energy, Our Power Energy, and Robin Hood Energy. These companies highlight values, such as openness, transparency, fairness, the democratisation of the energy sector, equality, and inclusivity. Co-operative Energy that is built on a co-operative model highlights their aim to enhance the lives of colleagues, members, customers, and the communities served [93]. Mongoose Energy, a co-operative business model, has an objective to put people in the heart of sustainable energy businesses [102]. Similarly, Our Power Energy, found by Scottish social housing providers, aims to deliver positive social impact and tackle fuel poverty [106]. Robin Hood Energy also labels itself as an energy company that is putting people first, is a non-profit, and it was launched by Nottingham City Council [109]. The company aims to tackle fuel poverty and keep prices lower, as they are not prioritising profits due to their business model.

4.1.4. Utilities with a Paradoxical Frame

The utilities with a paradoxical frame are Good Energy, Eneco Energy, and Ovo Energy. These utilities meaningfully demonstrate two or more frames in their statements. Therefore, they build different strategies to cope with the tensions between these frames. Good Energy combines environmental and business frames, while Ovo and Eneco Energy combine social and business frames. Good Energy increases investments in renewable energy technologies and identifies themselves as a purpose-led green energy services company. Good Energy balances their attention to environmental sustainability with long term

growth opportunities by delivering a green dividend policy [100,101]. Eneco, which is a subsidiary of the Dutch Utility Eneco Group, has recently changed their mission from “sustainable energy for everyone” to “everyone’s sustainable energy”, highlighting that “people can take responsibility for their energy and sustainability” [108]. Eneco highlights both democratisation and decarbonisation of the energy sector. Eneco underlines that the sustainable development goal “affordable and clean energy” is possible [97,98] by suggesting that they perceive the tension and yet they find ways of integrating these tensions. Finally, Ovo Energy states that their challenge is “how to blaze a new “mainstream green” energy path, while scaling-up and establishing [Ovo] as a significant player in the UK retail energy sector” [107]. Hence, Ovo Energy approaches sustainability with the awareness of tensions between business and environmental or social frames, treating the tension, not as a trade-off but a paradox.

4.2. The Configuration of Sustainable Alliance Portfolios of Case Study Organisations

Utilities with different organisational value frames demonstrate significant differences in the configuration of their alliance portfolio, in terms of partner diversity. This means that the way in which they interpret sustainability impacts who they choose to work with to tackle sustainability issues. Table 4 demonstrates a summary of sustainable alliance portfolios, including the number of business, research, NGO and government, council, and community partners. Table A1 in Appendix A, shows the full list of partners in the sustainable alliance portfolios of case study organisations. In this section, the configuration sustainable alliance portfolios of cases are explored. This section is organized to illustrate the similarities of the configurations of sustainable alliance portfolios when utilities are guided with the same organisational value frames.

Table 4. A Summary of Sustainable Alliance Portfolios of Case Study Organisations.

	Organisational Value Frames	Number of Business Alliances	Number of Research Alliances	Number of NGO Alliances	Number of Gov/Council/Community Alliances	Total
British Gas	Business Case	9	2	2	3	16
Co-operative Energy	Social	4	0	5	42	51
E. ON	Business Case	40	2	2	11	55
Ecotricity	Environmental	32	3	11	1	47
EDF Energy	Business Case	11	20	4	2	37
Eneco Energy	Paradoxical	14	0	3	2	19
Engie	Business Case	20	4	1	7	32
Good Energy	Paradoxical	10	0	16	0	26
Mongoose Energy	Social	3	0	0	8	11
Npower	Business Case	19	2	15	7	43
Opus/Drax	Business Case	7	3	0	3	13
Our Power Energy	Social	2	0	1	9	12
Ovo Energy	Paradoxical	10	0	6	6	22
Robin Hood Energy	Social	2	0	0	10	12
Scottish Power	Business Case	24	6	6	8	44
SSE	Business Case	9	1	5	2	17

4.2.1. Sustainable Alliance Portfolios of Utilities with a Business Case Frame

Different from other utilities, utilities with a business case frame mostly partner with business organisations. Since all of the incumbents of the sector are in this category, the portfolio size is large in the utilities with a business case frame. While this is not attributed to business case frame, it can be attributed to firm sizes. Utilities with a business case frame engage in diverse sets of alliances tackling environmental and social issues.

The business alliances of utilities with a business case frame are to build wind or solar farms, install solar panels, provide smart meters and other smart technologies for their customers, enhance energy efficiency and insulation for heating systems, install charging stations for electric vehicles, build

energy storage systems, and develop carbon capture and storage systems. Some examples of these alliances are as follows. For instance, British Gas partners with GenCommunity and Social Finance to offer solar panels for local government sites, such as schools and town halls, across the UK. Similarly, British Gas installs a large-scale solar system to a Toyota Manufacturing facility. Scottish Power, E. ON and SSE especially partner frequently with organisations to develop wind farms. For example, Scottish Power works with Alstom for expanding Whitelee windfarm, or with Dong Energy and Siemens for developing the Duddon Sands offshore wind project. Energy efficiency partners provide energy saving solutions like Nest Thermostat or provide the housing facilities like Castle Vale Community Housing in the case of Npower. E. ON partners with Nissan, while SSE partners with Source London to develop charging systems and stations for electric vehicles. Drax partners with Shepherd Group for the construction and design of a biomass power plant.

Utilities with a business case frame collaborate with various research organisations for sustainability. These research alliances are to develop renewable energy technologies, smart technologies, and smart grids or carbon capture and storage systems. Amongst others, EDF has a large portfolio of research partners for sustainability. For the development of renewable and low carbon energy technologies, British Gas partners with the Institute of Energy and Sustainable Development, E. ON with UCL Energy Institute, EDF with The Energy Technologies Institute. The University of Edinburgh works with Scottish Power to develop carbon capture and storage systems. MIT, CEPRI, RISEGrid, Académie des Sciences de Pékin (CAS), and INRIA works with EDF for smart grids and other smart technologies. Drax, in collaboration with the University of Sheffield, supports research with the “aim of changing the way energy is generated, supplied and used for a better future” [113].

Utilities with a business case frame often partner with NGO organisations for sustainability to provide financing and sponsorships for philanthropic reasons, such as homelessness, public health, and support of marginalised communities, to provide education and training programmes, create awareness about sustainable energy, and to engage in charitable causes through employee volunteering initiatives. For instance, British Gas partners with Shelter for homelessness, Engie partners with Watts of Love to support access to power in Guatemala, Npower partners with Trees for Cities to plant trees, Scottish Power partners with Cancer Research UK, and SSE partners with Nordoff Robbins. For education, training and awareness regarding sustainable energy, E. ON partners with The Scout Association, EDF partners with Keep Scotland Beautiful. Amongst others, Npower employees are very active in volunteering and fund raising for charitable causes. Some of their partners include Cancer Break Trust, Cancer Research UK, The Sports Relief, WheelPower, Community Service Volunteers, Acorns Children’s Centre, British Heart Foundation.

Utilities with a business case frame partner with government, council, and community organisations for sustainability to provide councils’ energy efficiency projects, to provide special tariffs to fight against fuel poverty and supply renewable energy, to co-develop wind farms, and to install solar panels in the state-owned schools, hospitals, and other buildings. Amongst other utilities with business case frames, E. ON has the most partnerships with councils. For example, in partnership with Councils of Latheron, Lybster and Clyth, Watten and Tannach, E. ON provides a fund that is managed by Foundation Scotland to support the communities in and around Camster Windfarm. SSE develops a special tariff in partnership with Shropshire Council. British Gas partners with Barnsley Metropolitan Borough Council, Generation Community Ventures, and Ignite to provide community energy by rooftop solar PV and a battery storage project in the UK.

4.2.2. Sustainable Alliance Portfolios of Utilities with an Environmental Frame

Different from other utilities, Ecotricity often has alliances with other businesses and NGOs that also prioritise environmental issues over other issues. Hence, green businesses and environmentally oriented NGOs are the preferred partners of Ecotricity. Often, these partnerships highlight clean energy, climate change, conservation, and transition to a green economy.

The only utility solely with an environmental frame, Ecotricity, partners with business organisations for sustainability to co-develop campaigns to switch customers to renewable energy suppliers, co-develop wind energy technologies and wind farms, and build charging stations. Ecotricity partners with Michelin, B&Q, Sainsbury's and Ford to install wind turbines and co-develop wind farms and partners with Nissan, MFG, IKEA, and Chargepoint services to provide electric vehicle charging facilities. Ecotricity engages in switching campaigns, with other purpose-led or green businesses, such as The Espresso Mushroom Company, The Community Farm, Po-Zu, and Allotinbox. The difference of these business partners from the partners of utilities with business case frame is the environmental orientation of these businesses. Also, often these switching campaigns with other businesses endorse and legitimise Ecotricity and support the transition to low-carbon electricity generation. Good Energy, a utility with environmental and business frames juxtaposed, has similar business alliances to those of Ecotricity.

Ecotricity has a research alliance with SGS College to build Eco Park to form a green business hub and support the growth of the green economy. Ecotricity also has an alliance with Sparsholt College, financing and building the Green Gas Mill for the development of the College's Renewable Energy Demonstration Centre. Ecotricity also developed an electric bike in collaboration with Kingston University London.

Ecotricity frequently partners with NGOs especially for environmental causes such as forest and wildlife conservation through switching campaigns. Ecotricity supports NGOs, such as National Forest Partnership, Naturesavetrust, International Tree Foundation, World Forest Organisation, and Green Britain Foundation for conservation purposes. These alliances are also in the form of switching campaigns, and NGO partners receive a donation when customers switch to renewable energy provided by Ecotricity. Thanks to these alliances different environmental organisations endorse the cause of Ecotricity and Ecotricity also supports the cause of these NGOs. Ecotricity has initiated Green Britain partnership, "a network which was initiated by Ecotricity bringing together a wide range of environmental organisations, politicians, businesses and celebrities to promote sustainability in energy, transport and food" [114].

Ecotricity, to date, has only reported one partnership with a government organisation, Forest Enterprise England, also as a switching campaign to support national woods and forests in the UK, where Ecotricity donates on behalf of customers that switch to Ecotricity.

4.2.3. Sustainable Alliance Portfolios of Utilities with a Social Frame

Different from other utilities, utilities with a social frame most frequently partner with government organisations, especially city councils and community organisations.

Utilities with social frame partner with business organisations for sustainability, especially with social housing associations, such as WHG, and other environmental organisations, such as Anesco or British Solar Renewables or Big Clean Switch. Robin Hood Energy partners with Ram Energy, another non-profit utility launched by Derby City Council, and Ebico, a social enterprise, to supply energy and tackle the issue of fuel poverty.

Utilities with a social frame, to date, have not reported alliances for sustainability with research partners.

Utilities with a social frame partner with NGOs, especially for social causes. For instance, Co-operative Energy provides philanthropic donations to New Life Foundation for Disabled Children, Dogs for the Disabled, Teenage Cancer Trust, and Women's Aid. Esmée Fairbairn Foundation provides social investment funding to Our Power Energy to tackle fuel poverty.

Different from other utilities, utilities with a social frame most frequently partner with government, council, and community organisations for sustainability. Some of these alliances especially support the movement to decentralised electricity and the localisation of electricity to reduce inefficiencies during its transportation. For example, Co-operative Energy supplies renewable energy from forty-two community energy groups and co-operatives. Mongoose Energy, majority owned by the community

benefit societies, partners with many community groups, such as Wiltshire Wildlife Community Energy, to supply electricity from renewables that are produced by these community energy groups. Other alliances in this category tackle the issue of fuel poverty in the UK. For example, Hebrides Energy works with Our Power Energy to supply fairer prices through the Hebridean Variable Tariff. Robin Hood Energy is the leader forming joint ventures with city councils around Britain, such as Nottingham City Council, Sussex Councils, or Islington Council. The alliances that the utilities form with these councils provide special tariffs in the council areas and address the issue of fuel poverty. Ovo Energy, a utility that demonstrates a social and a business frame paradoxically co-existing, has also started a community energy programme, providing communities control over where their energy is from and has started to work with housing associations or community benefit societies. One such example is EnergySW, a partnership between Ovo and Advantage SW to provide cheaper and fairer deals to social housing communities.

4.2.4. Sustainable Alliance Portfolios of Utilities with a Paradoxical Frame

Different from other utilities, utilities with paradoxical frames demonstrate a portfolio that combines the logics of different frames as reflected in their sustainable alliance portfolios.

Utilities with a paradoxical frame partner with business organisations for sustainability. Eneco Energy partners with Unilever, Mars, Renault, Heineken, AkzoNobel, Honeywell, and Honda to supply renewable energy to their manufacturing sites. These alliances are like Ecotricity's alliances with Michelin, B&Q, Sainsbury's, and Ford. Good Energy has switching campaigns with other purpose-led or green organisations, such as Ecology Building Society and Pukka like Ecotricity's switching campaigns. Ovo Energy acquires ChargedEV and Indra Renewable Technologies, and partners with Chargemaster and Nissan to build charging stations and vehicle to grid systems. These alliances are like other business alliances of utilities with a business case frame or utilities with an environmental frame.

Utilities with a paradoxical frame to date have not reported alliances for sustainability with research partners. Utilities with a paradoxical frame partner with NGOs for sustainability. For instance, Eneco developed a project called one planet thinking together with WWF to support organisations to operate within the planetary boundaries. Good Energy mostly partners with environmental NGOs, such as Friends of the Earth, 10:10 Climate Action, Soil Association, and Transition Network. Ovo Energy, often through Ovo Foundation, supports organisations such as Forest of Avon Trust, CoolEarth, and Gloucestershire Wildlife Trust.

Utilities with a paradoxical frame also have alliances with government, council, and community organisations for sustainability. Eneco Energy partners with Scottish Water to develop Macritch Hill Wind Farm on the land of Scottish Water. Eneco also provides a community benefit fund for Lochluichart Community, a community that is close to Eneco's onshore wind project. Good Energy, to date, has not reported alliances with governments, councils, or community groups based on secondary data sources. Ovo Energy partners with councils, such as Kensington & Chelsea Council, Cheshire East Council, and others. These are very similar to the alliances that are formed by utilities with the social frame.

5. Discussion

This study demonstrates interesting findings of the organisational value frames of British electricity utilities and their sustainable alliance portfolios. In particular, the results shed light onto the relationship between organisational value frames and the configuration of sustainable alliance portfolios. In this section, the results are discussed and propositions are built to guide future research.

5.1. Organisational Value Frames of the Electricity Utilities in Britain

The results show that utilities demonstrate different cognitive frames, which is in line with the prior literature that suggests the electricity generation and supply industry is very diverse with regards

to their ownership structures, value propositions, and business models [24,115,116]. While the business frame may be dominant in other areas of business, when it comes to sustainability issues, these utilities often demonstrate business case, environmental, social and paradoxical frames; based on the secondary data these companies disclose.

Interestingly, the companies with the biggest (combined) market share (around 70%), the Big Six, often demonstrate a business case frame. These utilities often discuss the financial outcomes of sustainability initiatives and the contributions of these initiatives for corporate survival. This shows parallels with the literature on business case frame, which suggests that firms often view sustainability as reducing risks, increasing operational efficiency, the source of branding, and new market creation [47]. The literature emphasises that organisations interpret sustainability issues with a social frame focus on poverty, health and equality [56]. Indeed, utilities with a social frame emphasised community support and the importance of tackling fuel poverty in the UK, often with a non-profit business model or as a co-operative model. Utilities with a social frame highlight that they put people first. On the other hand, Ecotricity, with an environmental frame, emphasises that they put nature first, which is in line with the literature [48]. Those with paradoxical frames, such as Ovo, Eneco, and Good Energy, try to balance tensions between economic sustainability and environmental or social sustainability. Their statements demonstrate the acceptance of these tensions and awareness about the difficulty of providing clean energy that is also cheap and inclusive.

5.2. The Configuration of Sustainable Alliance Portfolios of the Electricity Utilities in Britain

The results show that utilities partner with other businesses within or outside of their supply chain, as the literature suggests [1]. These alliances with other businesses are formed often to co-develop projects for sustainable energy alternatives. While some of these businesses are technology providers, such as smart technology, cloud systems, energy management systems, or solar or wind technology developers, some of the business partners are manufacturing facilities or retailers. This demonstrates that inter-firm alliances other than supply chain interactions are also prevalent and very common [1].

The results show that research alliances are the least common in this sector in comparison to other alliances. While some utilities partner with universities for sustainable energy projects, these utilities are often from utilities with a business case frame and especially from the Big Six of the UK. This finding is interesting as it shows that, while there is growing research on renewable energy, smart grids, and electric vehicles, utilities are involved more in the alliances that commercialise these technologies as opposed to those that aim to develop them.

In agreement with the literature that suggests some NGO alliances may facilitate extensive corporate change and advocacy programs [70], utilities partner with different NGOs either in a unidirectional or bidirectional way. Some utilities do not go beyond a unidirectional relationship in which the firm contributes to the NGO with a philanthropic donation or employee volunteering. Yet, fewer utilities engage with NGOs in a more reciprocal and bidirectional way, whereby partners co-develop training projects, corporate change, and advocacy projects for sustainability issues. This finding resonates with the evolutionary approach of alliance relationships that Austin describes [117]. According to Austin, alliance relationships evolve from philanthropic to transactional and from transactional to transformational [117]. Our findings show that transformational relationships are still rare in this context.

Utilities partner with government organisations, city councils, and community organisations to supply renewable energy to government bodies and develop renewable energy projects. Some utilities, including Drax, EDF, Engie, Iberdrola (Scottish Power), and SSE, are partners of the Powering Past Coal Alliance, an alliance between governments and businesses, to commit to powering their operations without coal [118]. Other utilities, however, interacted especially with local governments, and city councils. The alliances with councils differ significantly from the alliances with central governments, as these alliances are either in the form of supply agreements for green energy or in the form of joint ventures. The joint ventures between a purpose-led utility and a city council develop schemes tackling

fuel poverty in the constituents of the council area. Finally, in line with the trend in decentralisation, some utilities show interest in purchase agreements from community energy projects around the UK.

5.3. The Role of Organisational Value Frames in the Configuration of Sustainable Alliance Portfolios

The findings confirm the literature by demonstrating that firms engage with different types of partners and show different levels of diversity in their sustainable alliance portfolio [8]. In line with the expectation, those organisations with the same value frames demonstrate similarity in their sustainable alliance portfolio configuration, especially with regards to portfolio diversity in terms of heterogeneity of organisations. To date, there have been studies about the cognitive frames and organisational value frames for corporate sustainability [13,16,18,35,46,47,58,119], and there have been studies about sustainable alliances [3,4,8,65,120]. However, this study is the first exploration of the relationship between organisational value frames and sustainable alliance portfolios that builds propositions that are based on empirical findings gained from exploratory cases.

The empirical findings show that utilities with a business case frame often engage with businesses and research institutions (at least around 50% of all alliances in their sustainable alliance portfolio) more so than governments and NGOs. There are two exceptions to this. Npower has considerable engagements with NGOs, however often these are the initiatives of Npower employees' volunteering activities for local charities as opposed to corporate agreements between Npower and these charitable organisations. Another exception is E.ON has several alliances with governments for energy efficiency projects, supplies renewable energy to public buildings, and supports communities around their wind farms. However, they highlight energy saving more than fuel poverty in most of these alliances, aside from the partnership with Knowsley Council and the Star Renewable Energy Fund where they highlight fuel poverty. When compared with NGO alliances of other utilities, utilities in this category often engage with NGOs with philanthropic activities, fundraising, and employee volunteering in a unidirectional way. Also, their alliances with NGOs often address health and well-being, as opposed to climate change, biodiversity, and affordable energy. The results show that while the portfolios seem diverse; the proportion of business and research partners is higher in the alliance portfolio. Based on these;

Proposition 1. *The proportion of business and research partners are higher in the sustainable alliance portfolio of firms with a business case frame when compared to firms with other frames.*

The utility with an environmental frame, Ecotricity, often engages with green or environmentally friendly businesses and NGOs with an environmental cause. This is also the case for Good Energy, which juxtaposes business and environmental frames paradoxically. Their sustainable alliance portfolio demonstrates that while they legitimise the cause of their NGO and business partners, their partners also endorse the cause of Ecotricity or Good Energy via the switching campaigns, highlighting clean energy and climate change as important causes to support. In this sense, these alliances seem to work for the benefit of both sides, as opposed to more unidirectional alliances of utilities with the business case. These alliances underline the necessity of a transition to a low carbon economy. Based on these;

Proposition 2. *The proportion of environmentally friendly businesses and NGOs are higher in the sustainable alliance portfolios of firms with an environmental frame when compared to firms with other frames.*

Utilities with a social frame collaborate most often with organisations in the government, council, and community category. These utilities highlight social sustainability issues, and especially fuel poverty, the democratisation and decentralisation of the energy sector, and community health and well-being in their sustainable alliance portfolio with governments, councils and community groups. Different from working towards a low carbon economy, like the utilities with the environmental frame, these utilities address electricity prices and affordability of electricity for marginalized groups as well

as introducing communities as electricity producers. This is the reason why communities and local governments play a central role in their alliance portfolio.

Proposition 3. *The proportion of governments, local governments and communities are higher in the sustainable alliance portfolios of firms with a social frame when compared to firms with other frames.*

Utilities with paradoxical frames partner with organisations that are guided by the frames they juxtapose. For instance, Good Energy, a utility with environmental and business frames juxtaposed, has alliances like that of Ecotricity, most often engaging with environmental businesses and NGOs. Eneco and Ovo, utilities with social and business frames juxtaposed, engage with environmental NGOs for climate change, conservation, and environmental sustainability, and engage with government, council, and community organisations for fuel poverty or with emphasis on social sustainability. While Good Energy has put less emphasis on fuel poverty and social sustainability, Eneco and Ovo highlight both social and environmental sustainability and partner both with environmental NGOs and with governments, councils, and community organisations. This is in line with the social frame integrating both environmental and social issues. To sum up, if business and environmental frames are juxtaposed, they engage with similar alliances to those with business frames as well as environmental frames. Based on these,

Proposition 4. *Different from other frames, organisations that interpret sustainability issues with a paradoxical frame build diverse alliance portfolio configuration based on the frames that are juxtaposed.*

Proposition 4a. *Those that juxtapose business case and environmental frames build a sustainable alliance portfolio that demonstrate alliances with both business and research partners and environmental NGOs and environmentally friendly businesses.*

Proposition 4b. *Those that juxtapose business case and social frames build a sustainable alliance portfolio that demonstrate alliances with both business and research partners and governments, local governments and communities.*

Proposition 4c. *Those that juxtapose environmental and social frames build a sustainable alliance portfolio that demonstrate alliances with environmental NGOs and environmentally friendly businesses and governments, local governments and communities.*

6. Conclusions

The objective of this work was to highlight organisational value frames and sustainable alliance portfolios and explore the relationship between the two. This study achieves this objective by (a) analysing 16 electricity utilities from Great Britain based on secondary data; (b) providing empirical evidence for different organisational value frames; (c) providing empirical evidence for differences of the configurations of their sustainable alliance portfolios; and, (d) proposing relationships between organisational value frames and the configuration of their sustainable alliance portfolios. Most importantly, the study demonstrates that there is a relationship between the configuration of sustainable alliance portfolios in terms of organisational diversity with their organisational value frames.

It is, of course, no surprise that firms select sustainability partners that think alike. There is a vast literature on cognitive homophily in different research areas to support this argument [30,31,121–123]. Cognitive homophily suggests that organisations select those that are similar to themselves to partner with [31]. However, we knew less about how cognitive homophily presents itself in sustainability alliances. The literature on sustainability alliances demonstrates that firms often access diverse knowledge and diverse value systems through their alliance partners [1,5]. However, to what extent and under which circumstances can a firm go beyond cognitive homophily to select partners that are

diverse? To what extent and under which conditions do we observe a cognitive diversity in sustainable alliance portfolios? These questions remain and are yet to be answered.

In this study, I demonstrated that the strength of cognitive homophily varies based on the firm's cognitive orientations, meaning their organisational value frames. For instance, the configuration of sustainable alliance portfolios of firms with business case frames is somewhat limited. Their portfolio demonstrates alliances that are transactional or philanthropic with their NGO partners and it is mostly dominated by business and research partners. Those firms with a paradoxical value frame demonstrate a higher diversity in the portfolio configuration depending on value frames that they juxtapose as well as deeper connections with their partners moving from transactional to transformational relationships [117]. Therefore, in this study, I go beyond the demonstration of cognitive homophily and demonstrate which organisational value frames could go beyond homophily, and why. Therefore, this study contributes to the theory of organisational value frames and alliance portfolios, by demonstrating how organisational value frames impact the configuration of portfolios and the strength of homophily in selecting partners.

The second contribution of this study is to the literature on electric utilities. The results demonstrate that the sustainable development goal on affordable and clean energy is a major challenge for electric utilities. Utilities with a social frame prioritise affordability and fuel poverty. On the other hand, those with an environmental frame prioritise clean energy, especially electricity that is produced by solar and wind. Utilities with a business case frame emphasise energy efficiency through smart solutions and digitisation of the sector, trying to bring about solutions that save money and reduce environmental impact. Utilities with a paradoxical frame accept the tensions between the affordable energy and clean energy and build strategies to tackle both while not prioritising one over the other. To sum up, this study demonstrates the cognitive pluralism of electric utilities and how their priorities regarding sustainability issues vary based on their cognitive frames.

The literature on organisational cognition places an important role in alliances, due to the cognitive pluralism that alliances can bring [78,79]. Alliances are viewed as sources of cognitive differences, and hence as the potential for innovation [78,79]. Therefore, the literature on sustainable alliances suggests that collaboration for sustainability is more likely to bring about positive and effective solutions than developing solutions in-house [2,8]. However, the results of our study show that there is a threat of cognitive biases in partnership selection. Therefore, sustainability practitioners and alliance managers should be aware of their own cognitive biases, and the biases that are brought by their organisational value frames in selecting sustainability partners. Partnering with cognitively very similar organisations may inhibit sustainable innovation [78,79]. A sustainability portfolio that is dominated by similar-minded sustainability partners may instead confirm the existing belief systems of the firm and result in organisational inertia [124].

Due to its exploratory nature, this study is not without limitations. There are limitations comprising the data being based on secondary sources, the generalizability and representativeness of cases in other contexts, and the number of cases studied. In this study, symbolic frames that firms strategically communicate with the external environment are used as a proxy of their organisational value frames. However, one could argue that the literature on greenwashing is growing due to the empirical evidence on organisations that demonstrate irresponsible behaviour and falsely advertising their environmental and social sustainability initiatives [125]. One such example of greenwashing is also in the electricity utility industry. For instance, the Green Mountain Power Corporation, which "targeted by several environmental groups for allegedly using polluting combustion technologies for their renewable energy sources, which they marketed as green energy" [125]. In the British electricity utility industry, another example of such a case is Drax Group. The CorporateWatch, a non-profit advocacy group, continues a campaign called "Axe Drax" against Drax Groups, which communicates biomass power as an important stepping stone on the UK's transition to low carbon energy [126]. These examples demonstrate that, while some organisational value frames can be captured from symbolic frames, symbolic frames may also be misleading if the organisation is engaging in corporate greenwashing.

Therefore, future research should overcome the limitations of symbolic frames by operationalising organisational value frames using primary data and developing better proxies to identify organisational value frames.

Further research that studies the configuration and evolution of sustainable alliance portfolios and their relationship with organisational value frames should go beyond the limitations of this study by using primary data as well as secondary data. Also, future research should explore the same relationship in different national and sectoral contexts to test these propositions. The result of the study has shown that organisational biases may impact the selection of sustainable alliance partners. Future research should identify how cognitive biases impact selection and whether firms with a paradoxical or a social frame are less likely to demonstrate these biases as opposed to those with a business, business case, or environmental frame. The study of Sharma and Jaiswal demonstrates that cognitive frames are not stable over time [18]. Hence, organisational value frames of an organisation may evolve thanks to learning from their sustainable alliance portfolios. For instance, a firm with a business case frame, in time, may move towards a paradoxical frame and interpret sustainability issues in a more integrated and complex manner. Therefore, future research should explore how organisational value frames change in time and whether this change is due to their sustainable alliance portfolios.

To achieve sustainable development goals, businesses collaborate with different organisations addressing sustainability concerns. To date, there have not been many studies that explore why they choose different partners. Studying whom they are partnering with and why they are choosing these partners can help us to understand whether these businesses are challenging themselves cognitively through these sustainable alliances and explain to what extent these alliances may lead to changes within their organisations.

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Appendix A

Table A1. Sustainable Alliance Portfolios of Case Study Organisations.

	Business	Research	NGO	Government/Council and Community
<i>British Gas</i>	Biogroup, Toyota Manufacturing UK, Energy Web Foundation (Engie and Royal Dutch Shell), GenCommunity / British Gas Solar and Social Finance, Ener G Cogen, Mears, SK Waste Solutions, Landis+Gyr, RedT Energy	BRE, Institute of Energy and Sustainable Development	British Gas Energy for Tomorrow Trust & Social Finance, Shelter	Northern Lincolnshire and Goole NHS Foundation Trust Barnsley Metropolitan Borough Council/Generation Community Ventures/Ignite, British Gas Solar (Energise Barnsley Project), National Energy Action (NEA)/Liverpool City Council and VIRIDIS
<i>Co-operative Energy</i>	WHG, Big Clean Switch, Eneco, Openfield		Woodcraft Folk, New Life Foundation for Disabled Children, Dogs for the Disabled, Teenage Cancer Trust, Women's Aid	Community energy suppliers
<i>E. ON</i>	Gorillaz, Nissan, Fakt Ag, Clever & The Open Fast Charging Alliance (OFCA), Uniti, Autogrid, First Fuel, Digikoo, Homeserve, Star Renewable Energy Fund, Bidgely, Enervee, Barratt Homes, Green Sky Energy (acquisition), Greensmith, Solarwatt, Cricket Scotland, The Westy Group, UK Green Investment Bank Plc., Elcore Thermondo, Swan, Kingspan Insulation Ltd. and Wetherby Building Systems, EDP, Spacetime, Leo, Internet of Things Infrastructure, Tado, Ene3, Morisons Utility Services, Greenwave Reality, Sunroof (Google), Sungevity Storage, Orcan, EQT Infrastructure, KPS Kite Power Systems, Statoil & Siemens OEM and ISPs, Holmen, Ampyx	UCL Energy Institute European Spallation Source for Neutron Research (ESS)	The Scout Association, Crimestoppers	Exeter City Council / East Devon District Council, Devon County Council / Exeter Chamber of Commerce and Industry (Low Carbon Task Force Group (LCTF)), Caerphilly County Borough Council, Edinburgh City Council, Milton Keynes Council and National Energy Foundation (NEF), Greater Manchester City Council, Knowsley Council, The Council and Nottingham City Homes, Department of Work and Pensions (DWP), Coastal West Sussex Partnership (Arun District Council, Chichester District Council, Adur and Worthing Councils plus West Sussex County Council), Brighton and Hove City Council, East Sussex County Council and Lewes District Council), Community Councils of Latheron, Lybster and Clyth; Watten; and Tannach District, Forestry Commission Scotland
<i>Ecotricity</i>	Nissan, MFG, Liverpool John Lennon Airport, Rolec, IKEA, Chargepoint services, Tesla, Big Clean Switch, Ecocabs, ANS, Abbey Road Studios / Universal Music, Triodos Bank, Volkswagen, Forest Green Rovers, 1 Gas, SunEdison (acquired), Solarcity, Green Lens Studios, The Espresso Mushroom Company, Chamberlains, Parity, Allotinbox, Po-Zu, The Community Farm, Michelin, B&Q, Sainsbury's, Ford, Greenbird, Evance Wind, Skanska, TLT	SGS College, Sparsholt College, Kingston University London	National Forest Partnership, Naturesavetrust, International Tree Foundation, World Forest Organisation, Send a Cow, The Vegan Society, The Vegetarian Society, Sea Shepherd, Viva, Friends of the Earth, RSPB	Forest Enterprise England
<i>EDF Energy</i>	PwC, Block Chain Initiative, Toyota, WSP, Ipsum, Coca-Cola, Low Carbon, IDEALondon, Blyth Offshore Wind, Greencoat Capital, Mitie, ABB, Nestle	Supergrid institute, ETI, SEIDO, BRE Group, PS2E, BHEE, Vedecom, Mateb, Cerea, MIT, CEPRI, RISEGrid, Académie des Sciences de Pékin (CAS), INRIA, IRDEP, Efficacity, INEF, Sensor City, Laboratoire d'Hydraulique Saint-Venant, France Energies Marines	Energaware, Edinburgh International Science Festival, Keep Scotland Beautiful, Breast Cancer Now	Innovate UK, Powering Past Coal Alliance

Table A1. Cont.

	Business	Research	NGO	Government/Council and Community
<i>Eneco Energy</i>	Unilever, Mars, Kingspan Energy, Onzo, Co-Operative Energy (Highlands & Mearns Wind), EDF Energy, Renault, Heineken, AkzoNobel, Siemens Wind, Rabobank, DroneGrid, Honeywell, Honda manufacturing site (Sevon solar farm)		WWF, European Federation for Living, One Planet Thinking (OPT)	Scottish Water, Lochluichart Community Trust
<i>Engie</i>	Evbox (acquisition), Carbon Recycling International (CRI), The Chartered Institute of Procurement & Supply, Schneider Electric, Viridity Energy, +ADD, Electro Power Systems S.A. ("EPS"), Reset Certification Scheme (Reset), Viva Technology Conference-Exhibition, KiwiPower, PassivSystems, Sonatrach, glow, Meridiam, CUI, Senoko Energy, Supply Chain Sustainability School, CRÉDIT AGRICOLE (joint venture), West Coast Energy, Yorkshire water	The Ohio State University, HEC Paris, Newcastle University, Nanyang Technological University in Singapore	Watts of Love	Cheshire East Council, Liverpool NHS Trusts, East London District Energy Scheme, Birmingham City Council, Transport for London, Sustainable Energy for All, Powering Past Coal Alliance
<i>Good Energy</i>	New Motion, Eden Project (Origami Energy), Big Clean Switch, Bush Theatre, BT, Piclo (open utility), Tobacco Factory Theatres, Pukka, Pets Corner, Ecology Building Society		BestRES, BAFTA (Albert-Creative Energy Project), Hay Festival 2016, Julies Bicycles, Friends of the Earth, 10:10 Climate Action, Bristol Pound, Centre for Alternative Technology, Soil Association, Bristol's Big Green Week, Green Party, Hawkwood College, Permaculture Association, Transition Network, size of Wales, Cape Farewell	
<i>Mongoose Energy</i>	Anesco, British Solar Renewables, Our Power Energy			Low Carbon Gordano, Wiltshire Wildlife Community Energy, Frome Renewable Energy Co, Bath & West Community Energy, Chelwood Community Energy, Heart of England Community Energy, Orchard Community Energy, Wight Community Energy
<i>Npower</i>	Carbon Clear, Tullis Russell, "BOC, Cansolv Technologies, IM Skaugen, The Shaw Group and Tullow Oil, DONG Energy, and Peel Energy, RUMM (acquisition), Quality in Tourism, Nest, Yorkshire Water, Cenergist, Castle Vale Community Housing Association (CVCHA), Statkraft, Innovation Birmingham, Trilliant, Belectric (acquisition), npower's sponsorship of the 'Flux Capacitor, Ospreys, Nottingham City Homes, Walsall Housing Group, The Interactive Services Group/Whitefriars Housing Group and its consultants/Technical Advisory Services (TAS) Ltd.	University of Bath Sheffield University Technical College	Cancer Break Trust, Cancer Research UK, Newlands Bishop Farm, The Sport Relief, WheelPower, Community Service Volunteers, Acorns Children's Centre, British Heart Foundation, National Energy Action, Macmillan Cancer Support, Christians Against Poverty and the Home Heat Helpline, Warm Zone, ShelterBox, Greenpeace, Trees for cities partnership, Macmillan, Smallpeice Trust	Doncaster Museum, Black Country Museum, British Armed Forces, Trussell Trust, National Energy Action (NEA) and Durham Christian Partnership, Energy Bill Revolution, Leicester City Council in partnership with NHS Leicester Children in Need, Equality and Human Rights Commission (EHRC)

Table A1. Cont.

	Business	Research	NGO	Government/Council and Community
<i>Opus Energy (Drax)</i>	Farm Power Apollo/ Anesco, Siemens Energy Service, Shepherd Group, Atchafalaya Basinkeeper, C-Capture, Lloyd's Register Rail U.K. and WH Davis, SOCOTEC	The University of Sheffield, University of Nottingham, Argenta, Imperial College London		The Powering Past Coal Alliance, Cardiff Council Moulton College and Northampton College
<i>Our Power Energy</i>	Social Investment Scotland, Mongoose Energy		Esmée Fairbairn Foundation	B&NES Council, Bath & West Community Energy, Community Energy South, HartlePower, Hebrides Energy, Stirling Council, Community Energy Scotland, Western Isles Council, Community of Craigmiller
<i>Ovo Energy</i>	The Green Consultancy (TGC), Anesco, Chargemaster, ChargedEV (acquired), Indra (acquisition), EnergySW (Advantage SW), CORGI HomePlan (acquired), Trojan utilities, Nissan		St Werburghs City Farm, Forest of Avon Trust and De Paul UK), Woodland Trust Energy, CoolEarth, Gloucestershire Wildlife Trust, Bristol City Council/1625 Independent People/South Gloucestershire and Stroud College (SGS), I Dig Trees	Kensington & Chelsea Council and Ubitricity, Fairerpower (Cheshire East Council), Peterborough Energy (Peterborough City Council), Southend Energy (Southend-on-Sea Borough Council), Plymouth Energy Community, Islington Council
<i>Robin Hood Energy</i>	Ebico, Ram Energy			Nottingham City Council, Sussex Councils, Islington Council (Angelic Energy), Doncaster Council (Great North Energy), Southampton City Council (CitizEn Energy), Leeds City Council (White Rose Energy), Liverpool Energy Community Company (Leccy), Bradford Council, Calderdale Council, Corby Borough Council
<i>Scottish Power</i>	Domestic & General, ORE Catapult, Energy Systems Innovation Platform (ESIP), Centrica, Dong Energy, SSE, Scottish Power, Statoil, Wood Group, Clean Energy (previously SgurrEnergy), E.ON, ACTAVO, Waracle, Associated British Ports (Port of Lowestoft), LAMPRELL, Statoil (Hydro), Hammerfest Strøm, Met Office, Wikinger contractors (Adwen, Navantia, Offshore WindForce and Prysmian), AREVA, ANDRITZ HYDRO, Alstom, EOLE-RES (Ailes Marines), Skye	Energy Technology Partnership (ETP), Glasgow Caledonian University's (GCU), Newcastle University, World Pheasant Association (WPA), The University of Edinburgh, CCS Knowledge Partnership	Cancer Research UK, Glasgow Clyde College, Halo, The Lowestoft Skills Conference (inspiration trust), RNIB and Action for Blind People, People Trust	Glasgow's Fuel Poverty Partnership (Glasgow City Council, Scottish Federation of Housing Associations Glasgow and West of Scotland Forum of Housing Associations, Glasgow Advice and Information Network, The Wise Group, Greater Glasgow Health Board and Energy Action Scotland), Argyll/Bute Council, Forestry Commission Scotland, Energy Skills Partnership, Resource Efficient Scotland, Liverpool City Council (LCC), Glawgow Warriors, Powering Past Coal Alliance
<i>SSE</i>	Source London, SSE Airtricity and W5, Mitsubishi Heavy Industries (MHI), SignVideo, MapleCo (SGN Smart), Dixons Carphone, Open Utility-Piclo, Statoil Atkins/Siemens/Siemens Transmission and Distribution/Subsea 7/Burntisland Fabrications/Mitsubishi Power Systems	Mitsubishi Ink Low-Carbon Alliance	Dublin Zoo, Teach First, Barnardo's, Nordoff Robbins, The SSE Women's FA Cup	Powering Past Coal Alliance, Shropshire Council

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