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Optimal distinctiveness of incumbent and new entrant firms in the South African energy sector – A dynamic capabilities perspective

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ABSTRACT

The renewable energy transition represents a fundamental regime change globally and in South Africa, due to the limited supply of fossil fuels, low electrification rates in many regions and the threat of climate change. South Africa signalled its commitment to this transition by creating the Renewable Energy Independent Power Producers Procurement Programme. Power producers play a critical role in this transition and face numerous challenges, strategising to shape a competitive position with the industry context whilst simultaneously managing stakeholder perceptions. This study leveraged the dynamic capabilities perspective to understand how incumbent and new entrant firms in the South African energy sector achieve optimal distinctiveness, which lies at the intersection of strategic management and institutional theory, by reconciling the tensions between seeking differentiation and gaining institutional legitimacy.

The study adopted a qualitative research design Interviews were conducted with participants across incumbent and new entrant energy firms and organisations with sectoral level relevance in the South African energy sector.

The research outcomes revealed critical insights into the various orchestrating mechanisms, and associated contingent factors, that incumbents and new entrants used to achieve optimal distinctiveness. These outcomes contribute to the literature on optimal distinctiveness.

KEYWORDS

Market forces, institutional forces, dynamic capabilities, orchestrating mechanisms, optimal distinctiveness

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy in Corporate Strategy at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Signed: Sivenesan Govender Date

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF KEY ACRONYMS AND ABBREVIATIONS

REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
UN	United Nations
SDG	Sustainable development goals
INC	Incumbents
NE	New entrants
SLO	Sectoral level organisation
PP	Power producers
IPP	Independent power producers
IRP	Integrated resource plan
PV	Photovoltaic
EPC	Engineering, procurement and construction
RQ	Research question

CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1. Background to the research problem

This study set out to understand how incumbent and new entrant firms in the South African energy sector address the competing pressures of differentiation and institutional legitimacy and conformity in securing an optimally distinct position within their industry context.

South Africa reinforced its commitment to sustainable development post the World Summit on Sustainable Development by releasing the White Paper on Renewable Energy (Department of Minerals and Energy [DME], 2003). This commitment also aligned with the United Nations Sustainable Development Goals (SDGs) on affordable and clean energy (SDG 7) and climate action (SDG 13) (United Nations, 2015). The White Paper outlined the move globally towards renewable sources of energy in response to global climate change and to alleviate issues associated with the use of fossil fuels for energy. Some of these issues relate to the societal and health implications from the burning of fuelwood to the emission of carbon dioxide due to the consumption of fossil fuels. Renewable energy provides socio-economic benefits across the employment, health and societal dimensions (International Renewable Energy Agency [IRENA], 2017). Some of the main benefits of the transition to renewable energy relate to energy access for rural communities with low electrification rates (Holstenkamp, 2019), while environmental benefits relate to a reduction in carbon emissions.

Furthermore, there is an associated economic benefit from transitioning to a low carbon economy (Bhattacharya, Paramati, Ozturk, & Bhattacharya, 2016). The renewable energy industry may result in greater job creation as it is more labour intensive than fossil fuel generation methods; as an example, solar panels for residential use require material amounts of human labour for installation. The move towards renewable energy may also create more comprehensive economic benefits across the associated supply chain, with related and unrelated businesses benefiting from renewable energy penetration (IRENA, 2017). Many renewable energy systems generate electricity with no associated air or water pollution emissions, which addresses the health concerns associated with fossil fuel-based energy sources (Union of Concerned Scientists [UCS], 2017).

The report on the state of renewable energy in South Africa (Department of Energy, 2018) provides South Africa's progress with respect to transitioning to a low carbon economy based on the commitments highlighted by the Department of Minerals and

Energy. In particular, South Africa launched the Renewable Energy Independent Power Producer Procurement Programme (REIPPP) in South Africa in 2011, which allowed for the generation of renewable power by independent power producers to contribute to the South African national power grid. Eskom was designated as the buyer of this additional capacity (Department of Energy, 2018). Furthermore, Eskom will also undertake a decommission of its coal generation infrastructure (Department of Energy, 2019), which aligns to the increased generation capacity from renewable sources.

1.2. The research problem

The research problem centred on understanding how incumbent and new entrant firms within the South African energy sector achieve optimal distinctiveness and shape a competitive strategic position by satisfying both differentiation and institutional legitimacy and conformity (Zhao, Greg, Lounsbury, & Miller, 2017).

The study leveraged the dynamic capabilities perspective (Lessard, Teece, & Leih, 2016; Pitelis & Teece, 2018) in response to Zhao et al. (2017) and sought to understand what orchestrating mechanisms are used by incumbents and new entrants to balance the differentiation and conformity tension. The study also leveraged an institutional theory lens Andrews-Speed (2016) to deepen the understanding of the institutional pressures facing incumbents and new entrants.

1.3. Research question

The central research question (RQ) for this study was: How do institutional and economic/market forces jointly shape the strategic positioning of optimal distinctiveness for incumbents and new entrants in the energy sector of South Africa?

In response to this question, Zhao et al. (2017) specifically called upon the need to understand what orchestrating mechanisms firms can leverage to achieve optimal distinctiveness. Asset (or resource) orchestration is defined “as the ability to combine selected technologies, individuals and other resources in new products and processes regardless of location and across organisational boundaries” (Lessard et al., 2016, p.4). Furthermore, asset orchestration is centred in the dynamic capabilities framework (Pitelis & Teece, 2018). Therefore, the dynamic capabilities perspective by Lessard et al. (2016) and Pitelis and Teece (2018) was incorporated into this study to understand what orchestrating mechanisms incumbent and new entrant firms may leverage to achieve optimal distinctiveness. Therefore, the research sub-questions to the central research question were expanded, as listed in Table 1 below.

Table 1: Research sub-questions

Index	Sub-questions to the central research question
RQ 1	What is the role of economic/market forces in achieving optimal distinctiveness?
RQ 2	What is the role of institutional factors in achieving optimal distinctiveness?
RQ 3	How are internal and external resources leveraged in terms of dynamic capabilities and orchestrating mechanisms in response to economic/market forces and institutional factors?
RQ 4	How do the incumbents and new entrants compare in terms of achieving optimal distinctiveness?

Source: Author's own compilation

1.4. Research aims

This research aimed to explore how incumbent and new entrant firms in the South African energy sector achieve optimal distinctiveness, through the identification, embedment and leverage of orchestrating mechanisms (as a result of their dynamic capabilities) in their respective firms, to achieve a competitive strategic position within their industry context.

1.5. Research contribution

Further to the specific factors identified by Zhao et al. (2017), there were further factors highlighted as research contributions in Chapter 7. These research contributions may allow for a refinement of the theory (Crane, Henriques, Husted, & Matten, 2016) forwarded by Zhao et al. (2017).

1.6 Scope of research

Optimal distinctiveness represents the intersection of strategic management and institutional theories (Zhao et al., 2017). It builds upon the dynamic capabilities perspective and the resource orchestration component of dynamic capabilities (Lessard et al., 2016; Pitelis & Teece, 2018). This study also benefited by deepening the understanding of institutional pressures faced by energy firms by incorporating an institutional perspective by Andrews-Speed (2016). The physical scope of the research was situated at the industry level in the energy sector of South Africa in the context since the establishment of REIPPPP.

1.7. Structural outline of the research report

This section sets out the structural outline of the research report.

Chapter 1 sets out the business and theoretical need for the research. Chapter 2 presents a review of the extant literature for optimal distinctiveness, institutions, dynamic capabilities and resource/asset orchestration. A theoretical analysis is conducted for the extant literature, and a final synthesis of the literature is produced. Chapter 3 presents the research questions conceptualised from the literature review conducted in Chapter 2. These research questions are converted into interview questions which were posed to interview participants as part of the data collection process. Chapter 4 presents the research methodology leveraged for the study and indicates the manner in which the data was collected and analysed. Chapter 5 presents the research findings from the interview process. The research findings are arranged against theoretical categories and themes which resulted from the literature review in Chapter 2. Chapter 6 presents the research outcomes, which resulted from a comparative analysis between the extant literature and the research findings in Chapter 5. Chapter 7 presents the research conclusions and theoretical implications, limitations of the study, areas for further research and recommendations for managers.

Figure 1 illustrates the structural outline of the research report.

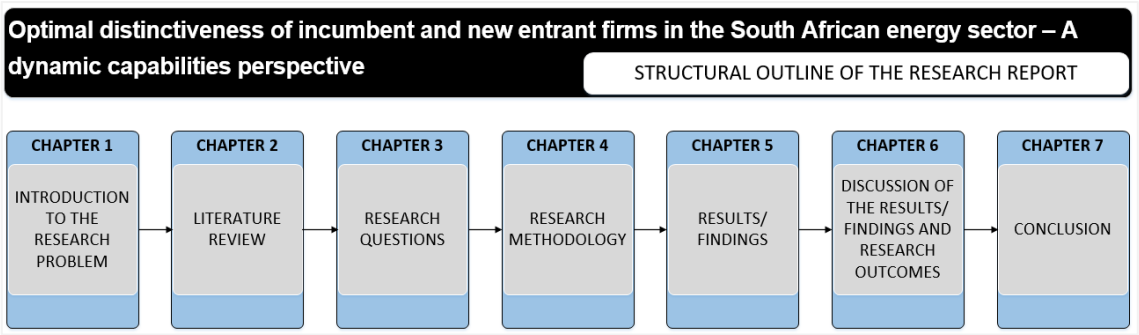


Figure 1: Structural outline of the research report

Source: Author's own compilation

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter presents a review of the extant literature related to optimal distinctiveness, dynamic capabilities and resource/asset orchestration. Furthermore, a literature review of institutional theory in its application towards renewable energy transitions is also presented.

Each section of the literature review concludes with a theoretical analysis, in the form of a comparative analysis, across different sources of the literature related to a particular definition, concept, construct or theory. Most of the comparative analysis's pertinent conclusions are presented in Section 2.7 as a final synthesis of the literature review. Figure 2 provides a structural outline of the literature review.

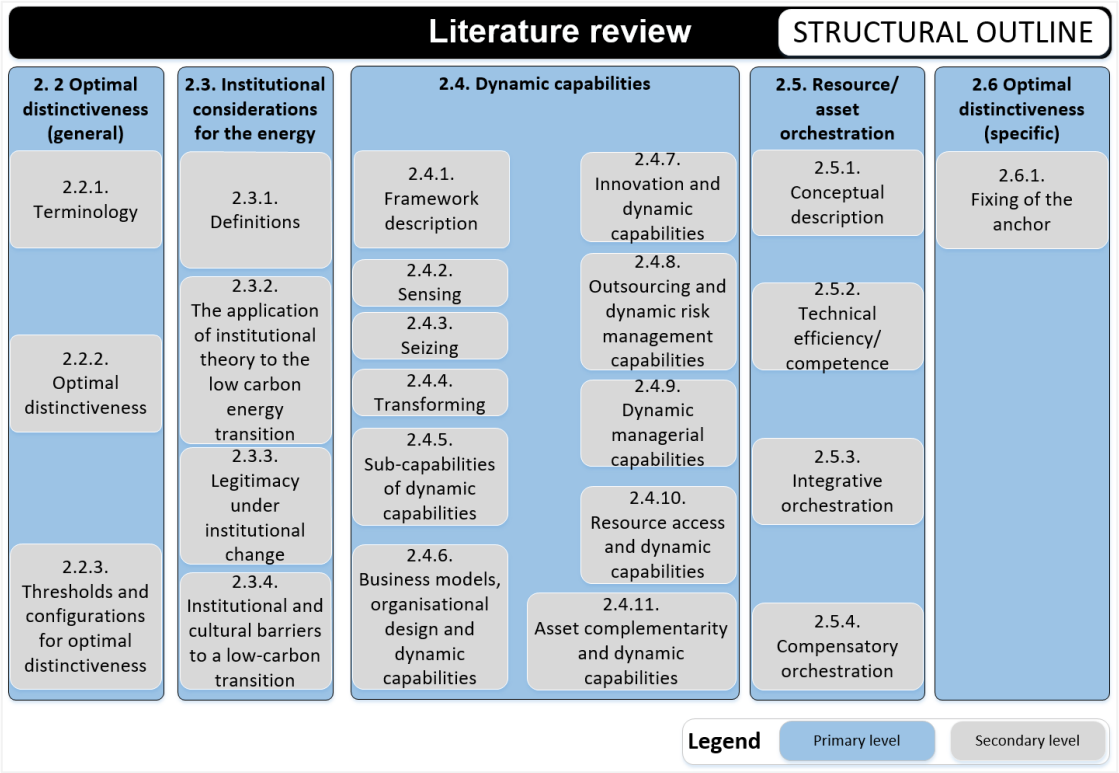


Figure 2: Literature review: structural outline

Source: Author's own compilation

The literature review commences with optimal distinctiveness and then expands on the dynamic capabilities framework and resource orchestration (as a component of the dynamic capabilities framework). The literature review also provides an entry into institutional theory in its application towards renewable energy transitions.

2.2. Optimal distinctiveness (general)

2.2.1. Terminology

Incumbents are defined as firms that entered an industry before an institutional change and continue to compete in the new environment whilst entrants are defined as firms that entered an industry after an institutional change (Madsen & Walker, 2017).

2.2.2. Optimal distinctiveness

According to Zhao et al. (2017), firms continually manage competing pressures to differentiate themselves from their organisational peers, whilst seeking legitimacy and conformity to avoid punitive measures being instituted upon them due to deviance from institutional requirements within their operating environment. “Given this conformity versus differentiation tension, scholars have argued that firms need to engage in strategies that achieve optimal distinctiveness-positive stakeholder perception that this tension has been appropriately reconciled” (Zhao et al., 2017, pp.1-2). Furthermore, optimal distinctiveness may be considered as a balancing act between differentiation and conformity (Barlow, Verhaal, & Angus, 2019). Similarly, McDonald & Eisenhardt (2020) proposed that optimal distinctiveness balances between being different and being the same. Distinctiveness is considered as a deviation from average positions (Haans, 2019). Haans (2019) also argued that firms that assume positions close to the average attain the highest levels of legitimacy but simultaneously encounter the highest levels of competition.

Zhao et al. (2017) proposed that incumbent and new entrant firms may achieve different optimally distinct market positions given the interplay of market and institutional forces. It is possible that new entrants, with enhanced technical competence and market adaptability, could outperform incumbent firms. Indeed, institutional legacies (such as government relations) may also favour incumbents from new entrants' specific technical competences (Zhao et al., 2017). However, according to (Baden-Fuller & Teece, 2020; McKnight & Zietsma, 2018; Sirmon, Hitt, Ireland, & Gilbert, 2011), new entrants typically face legitimacy issues.

The achievement of optimal distinctiveness is a function of a firm’s ability to manage a portfolio of different orchestrating mechanisms and integrate it into the firm’s practices, and identify critical stakeholders, whose perceptions around the reconciliation of the tension between differentiation and conformity should be satisfied (Zhao et al., 2017).

Figure 3 suggests possible optimal distinctiveness positions that incumbents or new

entrants may assume within the industry context, based on Zhao et al. (2017).

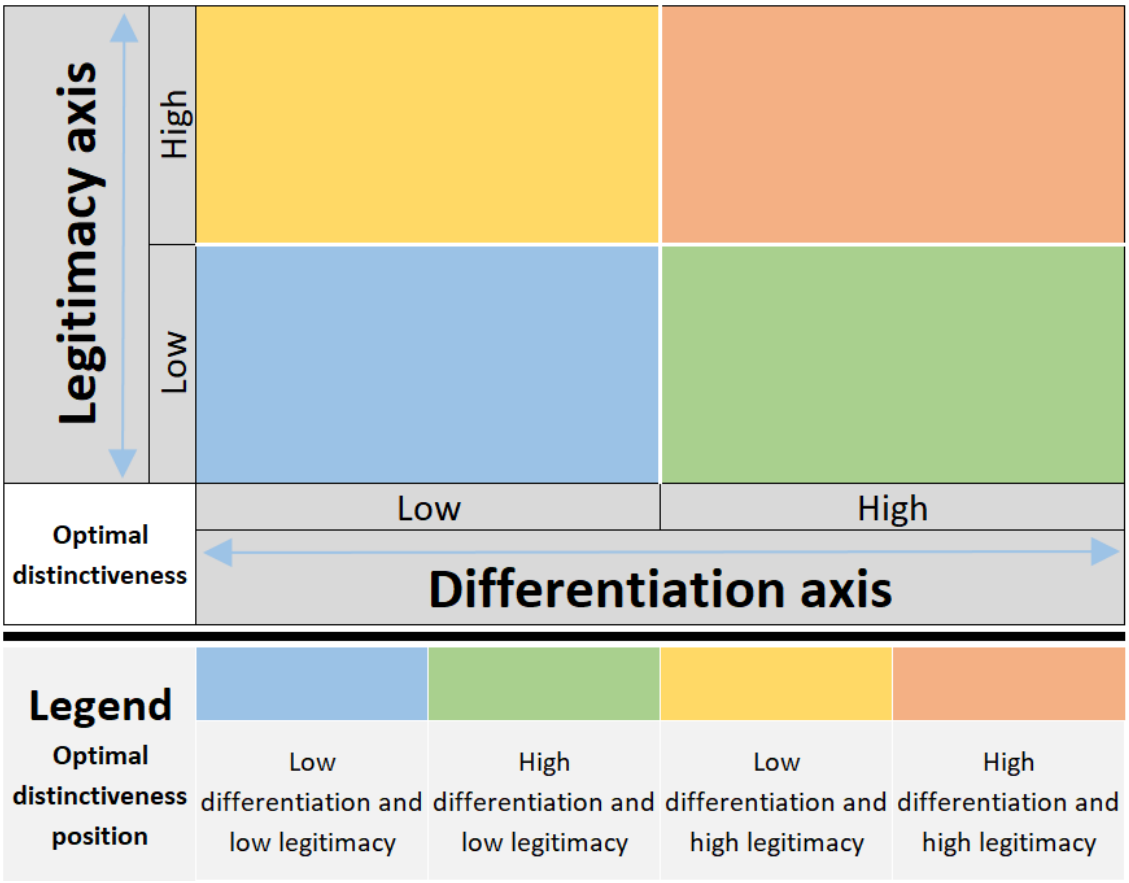


Figure 3: Possible optimal distinctiveness positions

Source: Author's own compilation.

Possible optimal distinctiveness positions may include a configuration across the differentiation and legitimacy dimensions depicted in Figure 3, such as low differentiation and low legitimacy, high differentiation and low legitimacy, low differentiation and high legitimacy or high differentiation and high legitimacy.

Three key dimensions, being orchestration, stakeholder multiplicity and managing temporality, may serve to "stimulate new insights into effective management of various competing demands and organisational tensions, including exploration versus exploitation and innovation versus imitation" (Zhao et al., 2017, p.16). This study focused on the orchestration dimension of the three key dimensions noted in Zhao et al. (2017) and how this may be developed to address the conformity versus differentiation tensions, including the need for positive stakeholder perceptions that this tension is reconciled. The integrative and compensatory orchestration mechanisms Zhao et al. (2017), are reviewed in Section 2.5.

2.2.3. Thresholds and configurations for optimal distinctiveness

Further to the integrative and compensatory orchestration mechanisms articulated by Zhao et al. (2017), McKnight & Zietsma (2018) proposed a third orchestration mechanism called threshold orchestration. Threshold orchestration suggests that legitimacy may be generated to a minimum or sufficient level to satisfy stakeholder perceptions. Furthermore, McKnight and Zietsma (2018) suggested that conformity and differentiation do not always exhibit an inverse relationship. In particular, contextual factors (or competitive anchors Zhao et al. (2017)) created thresholds to be addressed to gain requisite levels of legitimacy to achieve optimal distinctiveness.

McKnight & Zietsma (2018) conceptualised six conditions under which optimal distinctiveness is managed. These conditions are illustrated in Table 2.

Table 2: Conditions under which optimal distinctiveness is managed

Index	Condition
1	Use of a differentiating frame
2	Collaborative strategy
3	The radicalness of a firm’s technologies
4	The incumbency dependency faced by firms
5	The entrepreneur's prior relevant experience
6	The firm’s presence in international markets.

Source: McKnight and Zietsma (2018)

2.2.4. Comparative analysis

Table 3 presents a comparative analysis of the literature review on optimal distinctiveness.

Table 3: Comparative analysis of optimal distinctiveness

Concept	Definition	Key themes
Optimal distinctiveness	Optimal distinctiveness is about the positive stakeholder perception that the conformity versus differentiation tension has been reconciled (Zhao et al., 2017) Optimal distinctiveness is a balancing act between differentiation and conformity (Barlow, Verhaal, & Angus, 2019) Optimal distinctiveness balances between being different and being the same (McDonald & Eisenhardt, 2020) The achievement of optimal distinctiveness is a function of a firm's ability to manage a portfolio of different orchestrating mechanisms (Zhao et al., 2017) A firm may leverage either integrative or compensatory orchestration to achieve optimal distinctiveness (Zhao et al., 2017) Threshold orchestration represents a level to which sufficient legitimacy should be attained in order to achieve optimal distinctiveness (McKnight & Zietsma, 2018)	Stakeholder perceptions Optimal distinctiveness is a balancing act between differentiation and conformity Reconciliation of the conformity versus differentiation tension Management of a portfolio of orchestrating mechanisms to achieve optimal distinctiveness Integrative or compensatory orchestration Threshold orchestration

Source: Author's own compilation

The key similarity from Table 3 is that optimal distinctiveness is about the balancing act between conformity versus differentiation and must be managed through orchestration mechanisms (Barlow et al., 2019; McDonald & Eisenhardt, 2020; McKnight & Zietsma, 2018; Zhao et al., 2017). The key difference lies in the various views of how optimal distinctiveness should be attained. In conclusion, the overall definition of optimal distinctiveness aligns broadly with Zhao et al. (2017) and McKnight & Zietsma (2018).

2.3. Institutional considerations for the energy sector

This section provides a literature review to understand the institutional aspects faced by firms in the energy sector, which may benefit the research on optimal distinctiveness.

2.3.1. Definitions

An institution is defined as a “persistent and connected sets of rules (formal and informal) that prescribe behavioral roles, constrain activity, and shape expectations” (Sanderink & Nasiritousi, 2020, p.4). More specifically, this definition includes institutions “at the international and transnational level, which aim to globally steer behaviour of their members and perform identifiable governance functions, towards a common governance goal” (Sanderink & Nasiritousi, 2020, p.4). Similarly, Andrews-Speed (2016) articulates that institutions are conceptualised as formal and informal rules.

2.3.2. The application of institutional theory to the low carbon energy transition

According to Vakulchuk, Overland, and Scholten (2020), the fossil fuel industry may resist changes in a country's institutional landscape. Ting and Byrne (2020) indicated that regimes are considered sources of inertia, presenting a problem for change in the sustainability transition due to resistance and lock-in. Chang & Wu (2014) argued that new entrants typically display higher productivity levels to compensate for prevailing institutional barriers, which seemingly provided competitive advantages for incumbents.

Andrews-Speed (2016) extended the study of the low-carbon energy transition through an application of institutional theory, in order to acquire a more comprehensive understanding of the institutional landscape of a country’s low carbon energy transition

Andrews-Speed (2016) conceptualised three levels of institutionalism, as listed in Table 4. These levels may be used to categorise and understand the institutional legacies of incumbents and new entrants.

Table 4: Levels of institutions

Level of institutions	Sub-elements of institutional level
Embedded institutions	Norms, beliefs and ideas
Institutional environment	Political, economic and legal structures; government structures and property rights
Institutions which govern transactions	Firms, bureaus, markets, hybrids and networks. Policies, laws and policy instruments

Source: Andrews-Speed (2016)

“Historical, rational choice and sociological institutionalism all envisage actors, either individuals or organizations, as playing a key role in driving institutional change” (Andrews-Speed, 2016, p.5). Furthermore, institutional change may be characterised as

evolutionary or revolutionary. Andrews-Speed (2016) provided three forms of evolutionary change, as shown in Table 5.

Table 5: Forms of institutional change

Type of change	Description of change
Layering	Adding new elements to an existing institution
Conversion	New goals or actors are added to an institution to change its function
Drift	When a changing environment combined with policy inaction results in a gradual change in an institution or neglect.

Source: Andrews-Speed (2016)

Regime change is defined as “a gradual process of societal change spanning the economy, technology, organisations, rules, systems, values and behaviors” (Andrews-Speed, 2016, p.2). Similarly, Kucharski & Unesaki (2018) articulate that institutional change occurs through evolution in a particular area, such as technology. Therefore, obstacles to regime changes may be found along these same fields (Andrews-Speed, 2016). According to Andrews-Speed (2016), an improvement in understanding a nation’s institutional characteristics may assist with more accurate and realistic projections for the future energy transition.

2.3.3. Legitimacy under institutional change

Patala, Korpivaara, Jalkala, Kuitunen, and Soppe (2019) proposed that specific incumbents follow rhetorical institutionalism pathways and strategies, characterised by varying levels of legitimacy. More specifically, Patala et al. (2019) identified that these incumbents blended rhetorical strategies under institutional change by combining legitimacy-gaining technologies with legitimacy-losing technologies. Furthermore, the legitimacy gaining-technology was also incorporated into the long-term sustainability targets and strategy of a firm (Patala et al., 2019).

According to McKnight and Zietsma (2018), relevant experience accompanied by a successful track record conferred legitimacy. Furthermore, international market participation also conferred legitimacy and enabled differentiation from domestic counterparts in the renewable energy sector.

2.3.4. Institutional and cultural barriers to a low-carbon future

Various solutions, such as community micro-grids, may serve as enablers to renewable

energy transitions. However, Warneryd, Håkansson, & Karltorp (2020) recognised the challenge presented by informal and formal institutional barriers, more specifically, in the development of such community-based micro-grids. Warneryd et al. (2020) proposed that institutional developments leading to legitimacy should be initiated to accelerate the penetration of these community micro-grids.

Similarly, Sovacool & Griffiths (2020) identified several cultural factors that may present obstacles to a low-carbon transition. In response, Sovacool & Griffiths (2020) proposed that low-carbon transition programmes must incorporate mechanisms to overcome cultural obstacles to be effective and realise transition objectives. One such mechanism may focus on enhancing the "institutional capacity of local community-based organizations" (Sovacool & Griffiths, 2020, p.9).

2.3.5. Comparative analysis

Table 6 presents a comparative analysis of the literature review on the impact of institutions on the energy sector.

Table 6: Comparative analysis of institutions and institutional change

Concept	Definition	Key themes
Institution	Formal and informal rules (Andrews-Speed, 2016) Regimes are sources of inertia (Ting & Byrne, 2020) Various levels of institutions (Andrews-Speed, 2016) "persistent and connected sets of rules (formal and informal) that prescribe behavioral roles, constrain activity, and shape expectations" (Sanderink & Nasiritousi, 2020, p.4) Institutions include the embedded culture, societal norms, professional networks, the educational system, and the environment for innovation (Andrews-Speed, 2016)	Institutions are rules Institutions exist at various levels Institutions may be tangible (an institution may be a structure) or intangible (belief or norm) Institutions shape behaviour
Institutional change	Occurs through an evolution in a particular area, such as technology (Kucharski & Unesaki, 2018) Forms of institutional change (Andrews-	Institutional change occurs in various formats and spans across different aspects of the environment.

Concept	Definition	Key themes
	Speed, 2016) Institutional change may be evolutionary or revolutionary (Andrews-Speed, 2016) Regime change spans across the economy, technology, organisations, rules, systems, values and behaviours dimensions (Andrews-Speed, 2016) Resistance to institutional change lies in a country's domestic political, economic and social institutions (Vakulchuk et al., 2020) Relationships between varied institutions determine the pace and direction of a regime change (Andrews-Speed, 2016)	Reactions to institutional change include resistance Relationships between institutions exist Regime changes have pace and direction

Source: Author's own compilation

Key similarities were observed from the comparative analysis of institutions. These primarily related to the conceptualisation of institutions as a set of rules. Key differences were also found in the comparative analysis, particularly in how institutions influence behaviour. This influence depended on the level and form (tangible or intangible) of an institution's existence.

The key similarities from the comparative analysis of institutional change were that the changes occurred in differing formats and manifested across various dimensions of the environment. A difference or lack of clarity was found in terms of the impact on regime change observed when institutional relationships change.

The theoretical analysis of institutional change outlines the importance of understanding the location of the change in the institutional environment and the impact that it may have on market participants. The dynamic capabilities framework and orchestrating mechanisms discussed in Sections 2.4 and 2.5 respectively, build on this ability to sense and understand these changes in the environment and mobilise resources to exploit any perceived opportunities (Pitelis & Teece, 2018) that result from such changes.

2.4. Dynamic capabilities

2.4.1. Framework description

According to Teece (2018b), the dynamic capabilities framework assists organisations

to navigate uncertainty profitably. Dynamic capabilities were first considered as the "firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Lessard et al., 2016, p.4). Subsequently, dynamic capabilities were considered as organisational routines, that were performed by managerial functions, and conceptualised as the ability to sense (identify opportunities), seize opportunities, construct business models and transform the business by modifying structures and culture (Teece, 2018a) Sections 2.4.2 to 2.4.4 expand on the foundational elements of the sensing, seizing and transformation processes within the dynamic capabilities framework. Sections 2.4.5 to 2.4.11 provide a theoretical exposition of various extensions to the dynamic capabilities framework.

The literature review has included an in-depth exposition of dynamic capabilities to appropriately respond to the research questions and call by Zhao et al. (2017) to explore optimal distinctiveness from a dynamic capabilities perspective.

2.4.2. Sensing

Sensing involves identifying developments and making sense of the resulting opportunities (Baden-Fuller & Teece, 2020) and requires "systems to scan, learn, filter, interpret and calibrate data and information for identifying opportunities and threats." (Vanpoucke et al., 2014, p.448). Furthermore, sensing considers factors across a business's value chain, such as collaborative or supply chain mechanisms (Vanpoucke et al., 2014).

2.4.3. Seizing

According to Baden-Fuller and Teece (2020), seizing moves into execution and involves mobilising resources and strategic or alliance partners to commit resources to exploit the opportunities identified at the sensing stage. Furthermore, seizing new opportunities involves the creation and refinement of business models (Teece, 2018a).

2.4.4. Transforming

Teece (2018a) articulated that the transformation process involves realigning structure and culture and looks to align and invest in existing and additional capabilities, respectively. Furthermore, transformation is responsible for modifying integrative processes and is considered as the ability to adapt a firm's processes to dynamic environments (Vanpoucke et al., 2014). Consequently, transformation is a process that should be conducted repeatedly (Teece, 2018a).

Baden-Fuller and Teece (2020) indicated that the assembling and orchestration of

resources might originate within the firm and its alliances. Teece (2018a) argued that a firm must orchestrate its resources with partner firms' activities to deliver value to its customer base. A firm's management must also decide which of its activities must be conducted by complementary firms or outsourcing providers (Teece, 2018a).

2.4.5. Sub-capabilities of dynamic capabilities

Vanpoucke et al. (2014) proposed integration sensing, seizing and transforming as sub-capabilities of the dynamic capabilities framework to introduce and embed organisational processes to enable firms to adapt in the supply environment. Vanpoucke et al. (2014, p.447) defined supplier integration as "…the degree to which a manufacturer partners with its suppliers to structure inter-organizational strategies, practices and processes into collaborative, synchronized processes".

2.4.6. Business models, organisational design and dynamic capabilities

A business model "describes an architecture for how a firm creates and delivers value to customers and the mechanisms employed to capture a share of that value." (Teece, 2018a, p.40). The strength of a firm's dynamic capabilities is that these capabilities help shape its proficiency in business model design. The design and implementation of business models are outputs of dynamic capabilities, whilst ordinary capabilities comprise of threshold routines (Teece, 2018a).

Organisational design lies at the intersection of business models and dynamic capabilities. The organisational design components that can support strong dynamic capabilities and a particular business model are complementary (Teece, 2018a).

2.4.7. Innovation and dynamic capabilities

According to Leih & Teece (2016), innovation requires management through periods of uncertainty, with minimal organisational disruption. Uncertainty possesses different dimensions that may be addressed by sensing and sensemaking (Teece, 2018b). Firms with strong dynamic capabilities and a culture of continuous renewal demonstrate resilience and remain responsive during environmental shocks (Leih & Teece, 2016).

2.4.8. Outsourcing and a dynamic risk management capability framework

Sen, Kotlarsky, & Budhwar (2020) proposed an extension to the dynamic capabilities framework to consider outsourcing risks faced by firms. Typical outsourcing partners or vendors possess core competencies in outsourced processes and assist in exploring new opportunities. This extension to the dynamic capabilities framework allows firms to

maximise their opportunities and simultaneously manage risks through a more in-depth risk perception of their outsourcing environment (Sen et al., 2020).

2.4.9. Dynamic managerial capabilities

Helfat & Martin(2015) emphasised that dynamic managerial capabilities were essential in managing and effecting strategic change. It was argued that managerial cognition, managerial social capital and managerial human capital situate at the core of dynamic managerial capabilities and support the processes of sensing, seizing, reconfiguring and asset orchestration (Helfat & Martin, 2015).

Furthermore, Helfat & Peteraf (2015) advanced the role of managerial cognitive capabilities in sensing, seizing, reconfiguring and orchestrating assets. The study revealed that differences in managers' cognitive capabilities affected their ability to sense new opportunities and threats accurately. Similarly, strong cognitive capabilities provide a foundation for seizing new opportunities and responding to emerging threats through investments in particular assets (Helfat & Martin, 2015).

2.4.10. Resource access and dynamic capabilities

According to Stadler, Helfat, & Verona (2013), access and development of resources may benefit from dynamic capabilities before deploying these resources into the organisation to bring about strategic change. Stadler et al.(2013) demonstrated that activities resulting from dynamic capabilities directed towards strategic change were positively impacted by the application of dynamic capabilities during the resource access and development stage.

2.4.11. Asset complementarity and dynamic capabilities

Lampert, Kim, & Polidoro (2020) advanced asset complementarity theory by considering conditions of uncertainty across elements of the value chain when configuring assets. Furthermore, previous studies ignored the opportunity cost between resource commitment and the preservation of flexibility. Indeed, once resources are locked into a specific configuration, it may be difficult to leverage these resources to unlock value in the future. The theory advanced by Lampert et al. (2020) assist the dynamic capabilities processes of sensing, seizing and reconfiguring under conditions of uncertainty through the use of new theoretical constructs, branching and anchoring, and flexibility structures through specific complementary asset configurations.

2.4.12. Comparative analysis

Table 7 presents a comparative analysis of the literature review on dynamic capabilities.

Table 7: Comparative analysis of dynamic capabilities

Concept	Definition	Key themes
Dynamic capabilities	"The firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Lessard et al., 2016, p.4) Dynamic capabilities are competencies that allow firms to sense opportunities and threats, seize opportunities, and transform the business enterprise (Lessard et al., 2016)	Sensing Seizing Transforming The ability of a firm to change Internal or external competences The need to respond to a rapidly changing environment
	Dynamic capabilities are generally considered "the capacity of an organisation to purposefully create, extend, or modify its resource base" (Schriber & Löwstedt, 2018, p.307)	Change to a firm's resource base Change must be purposeful
	Integration sensing, seizing and transforming are sub-capabilities of dynamic capabilities related to supply chain integration (Vanpoucke et al., 2014)	Integration sensing, seizing and transforming Buyer-supplier context Supply chain integration
	The dynamic risk management capability allows firms to maximise opportunities and mitigate risks arising from outsourcing arrangements (Sen et al., 2020)	Outsourcing Maximise opportunities Minimise risk
	Managerial cognition, managerial social capital and managerial human capital are considered as the foundation of dynamic managerial capabilities (Helfat & Martin, 2015).	Managerial cognition Managerial social capital Managerial human capital

	Dynamic managerial capabilities directly affect the processes of sensing, seizing, reconfiguring and asset orchestration (Helfat & Martin, 2015; Helfat & Peteraf, 2015)	
	Dynamic capabilities affect resource access and development before deploying the resources to effect strategic change (Stadler et al., 2013).	Dynamic capabilities impact resource access and development prior to deployment of the resources into the organisation
	Complementary asset configurations address the trade-off between resource commitment and preservation of flexibility and assist the dynamic capability framework under conditions of uncertainty (Lampert et al., 2020)	Complementary asset configuration Branching Anchoring Uncertainty Resource commitment Flexibility preservation

Source: Author's own compilation

The key similarities across the definitions of dynamic capabilities relate to a firm's ability to respond to a rapidly changing environment and change.; this ability is embedded within a set of processes related to sensing developments and threats, seizing opportunities arising from the developments and mobilising resources and transforming the organisation's structure (Lessard et al., 2016). The key differences relate to the aspects that need to change; for example, in the case of Lessard et al. (2016), the change related to internal and external competencies, whilst for Schriber and Löwstedt (2018), the change related more generally to a firm's resource base and a need for it to be purposeful. However, these differences do not appear to contradict each other.

Furthermore, a literature review was conducted on various extensions to the dynamic capabilities framework that reside in or consider other parts of a business's value chain, including business model and organisational design (Teece, 2018a), innovation (Leih & Teece, 2016), the supply chain (Vanpoucke et al., 2014), outsourcing arrangements (Sen et al., 2020), resource access and development before deployment related to strategic organisational change (Stadler et al., 2013) and asset complementarity configurations to

address the trade-off between resource commitment and flexibility preservation (Lampert et al., 2020). Indeed, dynamic managerial capabilities may be considered as a foundation for the general dynamic capabilities framework as it supports the processes of sensing, seizing, reconfiguring and asset orchestration (Helfat & Martin, 2015; Helfat & Peteraf, 2015).

These extensions call for an application of dynamic capabilities in response to opportunities and risks at the organisation's core and peripheral points.

Finally, Figure 4 illustrates a conceptual map of the dynamic capabilities framework and the supporting literature reviews conducted in Section 2.4.

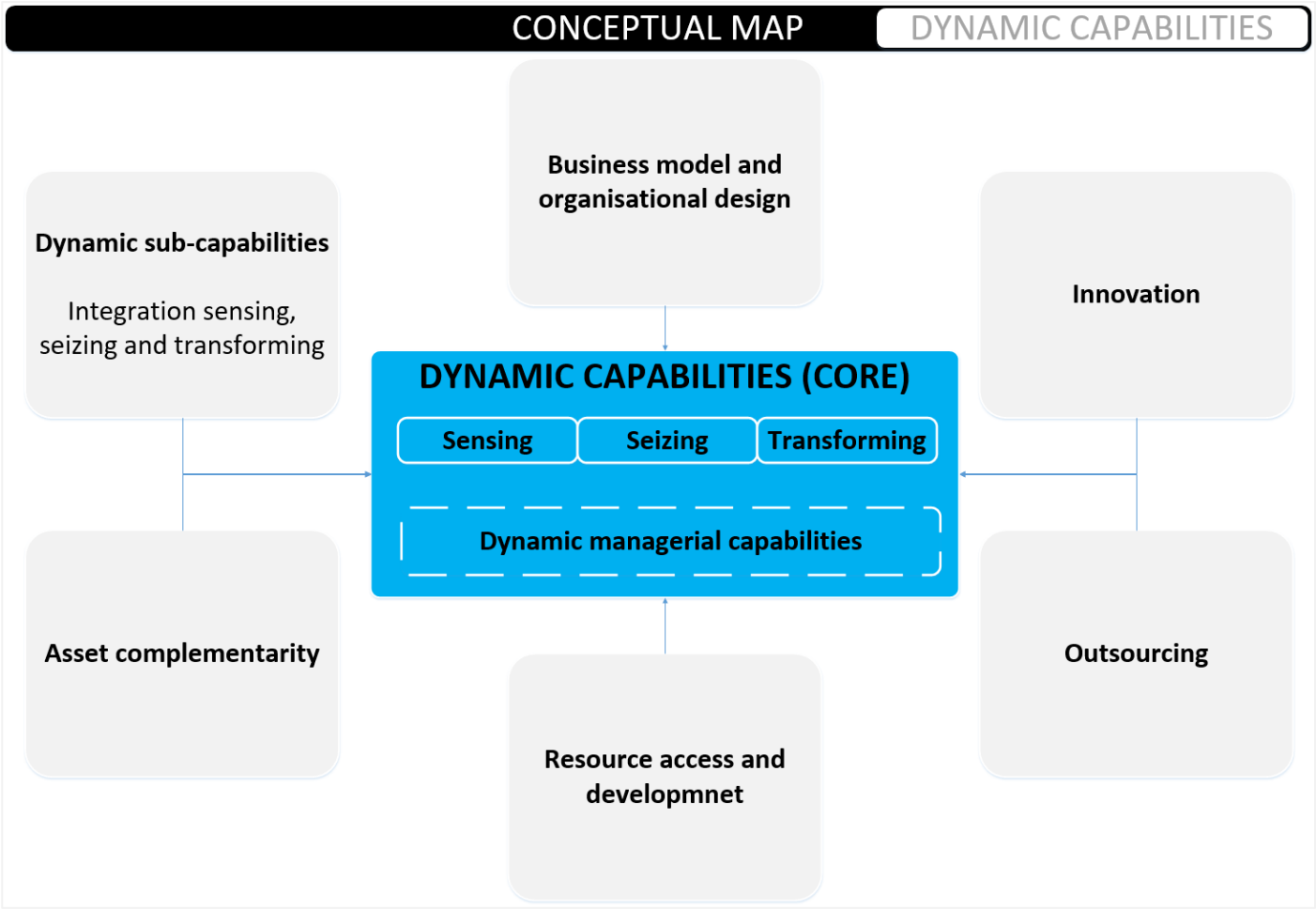


Figure 4: Conceptual map- dynamic capabilities

Source: Author's own compilation

2.5. Orchestrating mechanisms

2.5.1. Conceptual description

Asset orchestration is centred in the dynamic capabilities framework (Pitelis & Teece, 2018). It is defined as the ability "to combine selected technologies, individuals and other resources in new products and processes regardless of location and across organisational boundaries" (Lessard et al., 2016, p.4). Similarly, "asset orchestration refers to the selection, configuration, alignment, and modification of tangible and intangible assets" (Helfat & Peteraf, 2015, p. 842).

Dynamic capabilities provide a guide towards configuration and orchestration of corporate resources. The assets requiring orchestration can be internally or externally situated to the firm and may also be intangible or physical resources (Pitelis & Teece, 2018). With dynamic capabilities providing the processes to shape, sense and seize opportunities, orchestration theory may be leveraged to transform the organisation to maintain a sustainable competitive advantage (Pitelis & Teece, 2018).

According to Sirmon, Hitt, Ireland, and Gilbert (2011), a firm's resources orchestration should be considered across its breadth (scope including corporate or business unit levels), stage of the life cycle (start-up, growth, mature and decline) and depth (managerial levels) and follow a differentiation or cost leadership strategy. Sirmon et al. (2011) state that asset orchestration involves search, selection, configuration and deployment stages. The search and selection stages require assets to be identified and acquired, whilst the configuration and deployment stages require coordination of assets. These assets are deployed within newly designed organisational and governance structures and business models.

Sirmon et al. (2011) articulated that firms must establish viability by addressing enabling factors to gain legitimacy during the early stages of its entry into the market. These enabling factors may also include leveraging of alliances. "To gain legitimacy, a firm must understand and conform to at least formal institutional rules and regulations and often to the informal institutional norms and values of its target customers as well" (Sirmon et al., 2011, p.1400).

Following the establishment of legitimacy, new firms may focus on resource orchestration to scale the firm's operations. More specifically, growth stages require the formalisation of procedures and managerial hierarchy to manage a larger organisation (Sirmon et al., 2011).

Firms considered to be in a mature stage must focus on orchestrating resources to balance innovation and efficiency and pursue exploration or exploitation strategies. Exploration allows a firm to diversify its product offerings, whilst exploitation allows a firm to drive efficiency (Sirmon et al., 2011).

2.5.2. Technical efficiency/competence

According to Chattopadhyay and Bercovitz (2020), a firm's technical knowledge may be enhanced by investments in new knowledge and integrative capabilities aligned with existing technical assets. Furthermore, technical capabilities "refers to a firm's expertise in the technology and scientific discipline of the focal industry" (Moeen, 2017, p.3).

2.5.3. Integrative orchestration

According to Zhao et al. (2017), integrative orchestration represents a system-level orchestrating mechanism and is achieved when individual firm elements are combined in a complementary and unique manner and result in legitimacy and differentiation/distinction.

2.5.4. Compensatory orchestration

According to Zhao et al. (2017), firms may achieve optimal distinctiveness through compensatory orchestration, whereby deficiencies in one strategic dimension, as evaluated by stakeholders, are offset/compensated through conformity or legitimacy gains in another strategic dimension. An example of this is when a standard product offering is differentiated through excellent customer service.

2.5.5. Comparative analysis

Table 8: Comparative analysis of orchestration mechanisms

Concept	Definition	Key themes
Asset/resource orchestration	Resource orchestration is considered as the combination of resources towards the elevation of firm performance (Hughes, Hodgkinson, Elliott, & Hughes, 2018)	Combination of resources Higher firm performance
	"Asset orchestration is defined as the ability to combine selected technologies, individuals and other resources in new products and processes, regardless of location and across organisational boundaries" (Lessard et al., 2016, p.4).	Combination of selected resources New products and processes Location and organisational boundaries are flexible

	Asset orchestration requires dynamic capabilities to sense, seize and then transform an organisation (Pitelis & Teece, 2018)	Asset orchestration is contingent on dynamic capabilities
	Orchestration mechanisms (Zhao et al., 2017)	Integrative or compensatory orchestration
	"Asset orchestration refers to the selection, configuration, alignment, and modification of tangible and intangible assets" (Helfat & Peteraf, 2015, p. 842)	Selection Configuration Alignment Modification Tangible and intangible assets

Source: Author's own compilation

All definitions of asset/resource orchestration are generally consistent with each other and converge towards asset/resource orchestration as being the ability to combine and configure selected resources within a set of parameters to achieve an objective. However, it is not conclusive how the asset/resource orchestration's effectiveness may be measured.

It may be concluded that the specifics of asset/resource orchestration must consider the ability to combine resources and then further specify what these resources will achieve, in relation to some form of action induced by a dynamic capability.

This section's key outcome is the review of the dynamic capabilities framework and integrative and compensatory orchestration mechanisms, as it allowed the study to respond to the research question and call by Zhao et al. (2017).

2.6. Optimal distinctiveness (specific)

2.6.1. Fixing the anchor

Zhao et al. (2017) submitted a call for future research, articulated in the research questions in Section 1.3, to understand how incumbents and new entrants leverage orchestrating mechanisms to achieve optimal distinctiveness in establishing a competitive strategic position for themselves.

2.7. Conclusion

2.7.1. Final synthesis of the literature

The key aspects from Sections 2.2 to 2.6 in the literature review are synthesised in Table 9.

Table 9: Synthesis of critical conclusions across the literature review

Concept/theoretical category	Synthesised position	Themes
Context	Spans the economy, technology, organisations, rules, systems, values and behaviour dimensions	• Institutional factors • Economic/Market factors
Dynamic capabilities	Relate to higher-order capabilities to enable an organisation to change in response to a dynamic environment.	• Sensing • Seizing • Transforming
Orchestrating mechanisms	Relate to the ability to combine various resources in order to achieve a specific objective in relation to an action induced by a dynamic capability	• Ability to combine selected resources • Resources' location and boundary are flexible • An action induced by dynamic capabilities
Optimal distinctiveness	Optimal distinctiveness relates to the positive stakeholder perception that the conformity versus differentiation tension has been reconciled. A portfolio of orchestrating mechanisms can be leveraged to achieve optimal distinctiveness	• Stakeholder perceptions • Reconciliation of the conformity versus differentiation tension • Management of a portfolio of orchestrating mechanisms to achieve optimal distinctiveness

Source: Author's own compilation

The final synthesis presented in Table 9 (including other literature review elements) was used to analyse the findings from the interviews (contained in Chapter 5). The research outcomes are presented in Chapter 6, which assisted in understanding how incumbent and new entrant firms potentially leverage their dynamic capabilities and orchestrating mechanisms to achieve optimal distinctiveness.

2.7.2. Conceptual framework

Figure 5 illustrates the conceptual framework resulting from the literature review in Chapter 2.

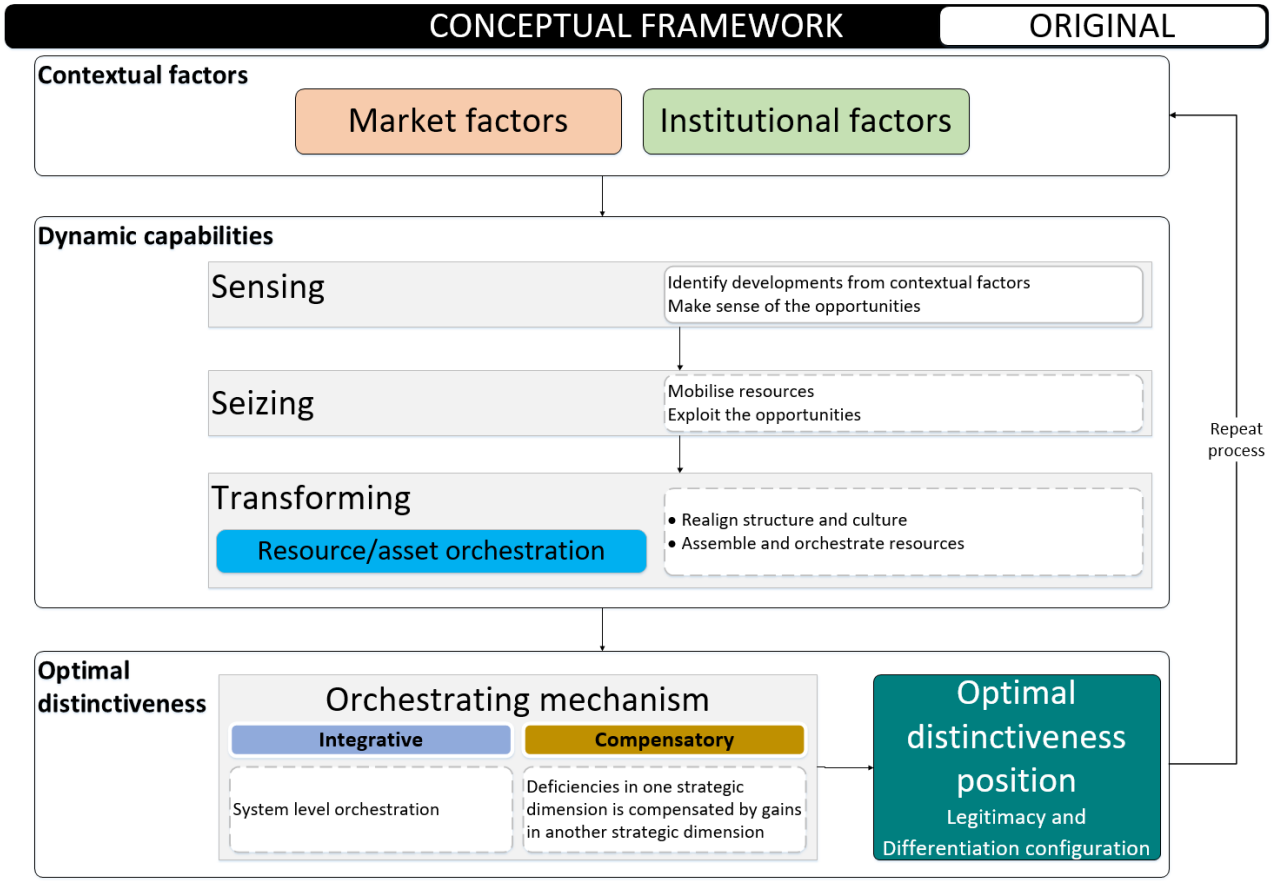


Figure 5: Conceptual framework resulting from the literature review

Source: Author's own compilation

2.8. Affirmation of the research problem

This study's research problem centred on understanding how incumbent and new entrant firms in the South African energy sector achieved optimal distinctiveness and focused on firms' leverage of their dynamic capabilities and orchestrating mechanisms to reconcile the tension between legitimacy and differentiation.

CHAPTER 3: RESEARCH QUESTIONS

3.1. Introduction

This chapter presents the research questions that will be answered as part of this study.

3.2. Research questions

The call for further research by Zhao et al. (2017) detailed in Section 2.6 was converted into the following exploratory research questions. A central research question is articulated with four sub-questions detailed in Table 10. Each sub-question is then mapped to the concepts/theoretical categories contained in Table 10.

The central RQ is: How do institutional and economic/market forces jointly shape the strategic positioning of optimal distinctiveness for incumbents and new entrants in the energy sector of South Africa?

Table 10: Research sub-questions

Index	Sub-questions to the central research question	Mapping to concept/theoretical category in literature synthesis (Table 9)
RQ 1	What is the role of economic/market forces in achieving optimal distinctiveness?	Context
RQ 2	What is the role of institutional factors in achieving optimal distinctiveness?	Context
RQ 3	How are internal and external resources leveraged in terms of dynamic capabilities and orchestrating mechanisms in response to economic/market forces and institutional factors?	Dynamic capabilities Orchestrating mechanisms
RQ 4	How do the incumbents and new entrants compare in terms of achieving optimal distinctiveness?	Optimal distinctiveness

Source: Author's own compilation

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

This chapter sets out the methodology that was used to conduct the research.

4.2. Choice of methodology

The research questions articulated in Chapter 3 are exploratory, and therefore, a qualitative research design method was selected. The specific approach of inquiry was interpretive, with interviews conducted to collect primary data, as the main objective was to make sense of (or interpret) Creswell & Creswell (2018) the meaning that participants in the renewable energy sector had related to the phenomenon of achieving optimal distinctiveness. The epistemological lens was that of a social constructionist worldview, as the goal was to rely upon the participants' view of the situation of the renewable energy sector in South Africa (Creswell & Creswell, 2018).

4.3. Population and research setting

The research setting was situated in the renewable energy sector in South Africa, post the establishment of REIPPPP in 2011. In particular, the population spanned both private and public sectors across renewable energy producers, services providers and other sectoral level participants. A purposive sampling method was used to identify specific participants (Patton, 2002).

4.4. Unit of analysis and level of analysis

The level of analysis was at the organisational level but not one or more in particular. The intention was to select from a diverse range of organisations, which depended on access and availability. The unit of analysis was key individuals at the various organisations identified.

4.5. Sampling method and size

4.5.1. Primary data

Purposive sampling Patton (2002) was used in this study to strategically and purposefully identify the unit and level of analysis.

The interview participants included key individuals at organisations that influenced the energy sector in South Africa; these individuals, including executives, senior management and technical specialists, were selected using the criteria listed below.

They worked for an organisation that met at least one of the following criteria:

- Was in existence prior to or after the establishment of REIPPPP respectively;
- Had an appropriate level of renewable electricity capacity generation;
- Contributed in some manner to the development of South Africa's renewable electricity generation capacity.

Intensity sampling was used to locate samples that were rich in information but not at the extremities; extreme sampling may present a distortion towards extreme success or failure and therefore, may not provide specific insights Patton (2002) into the conformity versus differentiation problem. As such, intensity sampling was used to select specific organisations for this study. Furthermore, maximum variation or heterogeneous sampling is a strategy for purposive sampling that allows for the discovery of themes across a large variation (Patton, 2002). Therefore, heterogeneous sampling was used in this study. Initially, at least 18 interviews were targeted; however, the final sample included 22 interviews.

4.5.2. Data saturation analysis

According to Fusch & Ness (2015), a failure to reach data saturation may impact the research quality and compromise content validity. Fusch & Ness (2015) argued that data saturation is reached when there is enough information to replicate the study, even when new information may be attained. Furthermore, data saturation is not about quantity but the depth of the data (Fusch & Ness, 2015).

Figure 6 presents the saturation analysis observed during the coding process. Participant 1 was considered as the base for the saturation analysis. For each subsequent participant, only a new code contribution was considered to the new code count. The saturation analysis revealed a significant (but not uniform) decrease in new codes and the moving average from participant 10. Therefore, saturation was approximately reached after participant 10.

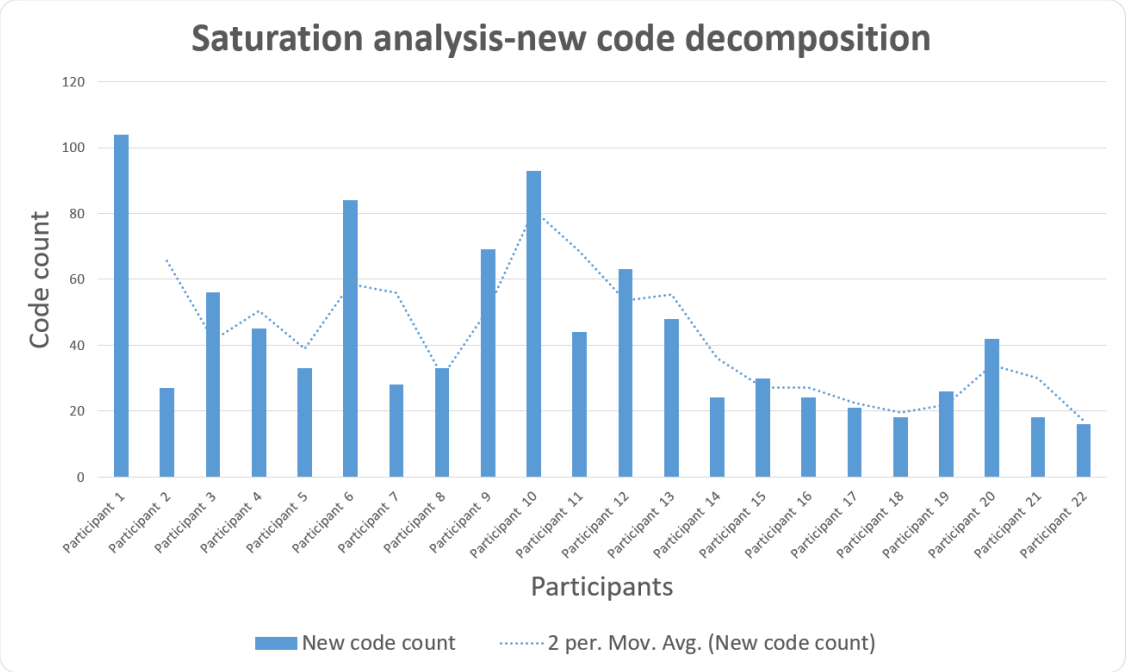


Figure 6: Saturation analysis

Source: Author's own compilation

4.6. Measurement instrument

The instrument was the interview protocol (the interview questions are contained in Appendix 1). After confirmation of the interview with a particular participant, the interview was planned for a date and time convenient to both participant and researcher. A recording was taken of the interview with the researcher making certain notes whilst the interview proceeded. The interview was preceded with an opening question that sought to understand the participant's history in the renewable energy sector; this question was also meant to allow the participant to remain comfortable during the interview process. No leading questions were asked. A probing yet non-specific question was used when the participants conveyed very little information or information that may have proved very insightful. A closing question was posed to the participant to understand their future expectations for renewable energy. Further information in terms of the data gathering process is provided in Section 4.7.

4.7. Data gathering process

Semi-structured in-depth interviews were conducted to gather primary data. The method of approach Tong, Sainsbury, & Craig (2007) was online conference calls through the Zoom platforms. The interview questions were drawn from the research questions and are presented in Appendix 1. A formal interview protocol Creswell & Creswell (2018) was

designed ahead of the interview processes. A checklist Tong et al. (2007) was also used to enhance the overall interview protocol. The interview protocol is presented in Appendix 2.

Furthermore, pre-existing, legally accessible, non-human public data pertaining to the renewable energy industry was sourced from appropriate websites and other relevant sources. This data was used as context in the study.

4.8. Analysis approach

The primary data collected was analysed by organising it into codes and themes using thematic analysis across all the data sources (Braun & Clarke, 2006; Creswell & Creswell, 2018). The overall inductive methodology explicated in Eisenhardt, Graebner, and Sonenshein (2016) was used in this study. Thereafter, a deductive approach was used to compare descriptive codes and develop a theoretical understanding of the data. Atlas Ti (www.Atlasti.com) and Microsoft Excel were used to facilitate the coding process post collection of the data. The coding processes defined in Creswell and Creswell (2018) and Braun and Clarke (2006) were used.

4.9. Ethical considerations

The data was stored without identifiers to ensure confidentiality and anonymity of respondents. No names of individuals nor organisations were stored or reported (where the identity of the respondent is known to the researcher). All forms of data will be stored electronically in password-protected computer systems, in an accessible format for a minimum period of 10 years. Furthermore, the informed consent form in Appendix 4 sought permission from respondents to allow the researcher to create an audio recording of the interview and to submit the audio recording to a transcription service (to aid the researcher's analysis), together with an accompanying non-disclosure agreement as contained in Appendix 3. The informed consent statement was also read at the start of the interview, with the participant's acceptance of the conditions captured on the audio recording.

All non-human data pertaining to the renewable energy industry was sourced from appropriate websites and other appropriate sources that are in the public domain, legally accessible and free of any copyright. The nature of these records relates to developments (legislative etc.) of the renewable energy sector in South Africa at the industry level. These data sources were selected in respect of their relevance to the industry level and hence, are not in direct relation to a particular company. This data was used as context in the study.

The notification of ethical clearance approval from the Gordon Institute of Business Science, University of Pretoria, is included in Appendix 6.

4.10. Quality and validity criteria

Measures to improve the rigour of the study were incorporated during the inquiry stage (Cypress, 2017) and not towards the conclusion of the study. Reliability relates to the ability to replicate the findings of the study by repeating the specific phenomenon whilst validity relates to the accuracy and truthfulness of the findings of the study (Cypress, 2017). The validity and reliability procedures outlined in Creswell and Creswell (2018), Cypress (2017) and Patton (2002) were used to enhance the rigour of this study.

A pilot interview was conducted to ensure that participants could clearly follow the interview protocol (Appendix 2), which was developed ahead of the interviews to improve the quality of the data collection process. Feedback from the pilot interview was used to refine the interview protocol. The interview questions and protocol was standardised for all participants. Table 39 in Appendix 1 contains a list of supporting interview questions, which allowed for probing non-leading questions to be asked during an interview. Participants were also assured of anonymity and confidentiality, which was articulated on the informed consent statement and read out at the start of the interview.

In general, the validity of the data was assured through triangulation, given the diversity interview participants across the energy sector in South Africa. Furthermore, the data saturation analysis was provided in Section 4.5.2 and indicated a general decrease in new code generation after participant 10. This allowed for the verification of findings from each interview.

4.11. Limitations of the research design and methods

The researcher is a novice, which may have proved to be a limitation in terms of the research design and methods used. The sample size, whilst not necessarily a problem, may benefit from a larger sample, however, given the limited time over which this study was conducted, obtaining a larger sample size may not have been practical nor possible. Lastly, the research setting was specific to South Africa and REIPPPP, therefore, the findings may not be applicable in other contexts. This may, however, serve as an area for further research.

CHAPTER 5: RESULTS/FINDINGS

5.1. Introduction

This chapter presents the key findings from the data collection process against the research questions set out in Chapter 3. The findings are arranged by the concepts/theoretical categories and themes noted in Chapter 2, in line with the mapping presented in Table 10.

5.2. Interview participants and context setting

A total of 22 interviews were conducted across public, private and international multilateral organisations through the Zoom conferencing online platform. Due to the prevailing COVID-19 pandemic in 2020, in-person interviews were not considered prudent nor safe. The interviews were recorded using the native Zoom functionality and thereafter, submitted to a transcription service.

The interview participants were arranged into two primary categories: power producers (PP) and sectoral level organisations (SLOs). Power producers were split further into new entrants (NE) and incumbents (INC). Table 11 presents a summary of the sector categorisation.

Table 11: Participant sector categorisation

Index	Sector category	Sector category reference
1	Power producers	PP
2	Sectoral level organisations	SLO

Source: Author's own compilation

The organisations that participants were employed by are arranged into the following categories presented in Table 12.

Table 12: Participant organisation to sector mapping

Index	Organisation type	Sector category
1	Independent power producer (renewables)	PP-NE
2	Energy producer (non-renewables)	PP-INC
2	Government ministry	SLO
3	Research institution	SLO
4	Regulatory body	SLO

Index	Organisation type	Sector category
5	Multilateral body agency	SLO
6	University	SLO
7	Energy consulting company	SLO
8	Industry association	SLO
9	Industry coalition	SLO

Source: Author's own compilation

Table 13 provides a summary of the participants interviewed and their roles in their respective organisations.

Table 13: Participant summary (role and organisation type)

Participant index	Participant role	Organisation type	Sector category	Organisation reference
1	Analyst	Regulatory body	SLO	Organisation 1
2	Director	Independent power producer	PP-NE	Organisation 2
3	Director	Research institution	SLO	Organisation 3
4	Director	Research institution	SLO	Organisation 4
5	Director	Energy consultancy	SLO	Organisation 5
6	Director	Energy consultancy	SLO	Organisation 6
7	Analyst	Regulatory body	SLO	Organisation 7
8	Manager	Research institution	SLO	Organisation 8
9	Manager	Energy producer	PP-INC	Organisation 9
10	Director	Government ministry	SLO	Organisation 10
11	Director	Independent power producer	PP-NE	Organisation 11
12	Policy advisor	Government ministry	SLO	Organisation 12
13	Policy specialist	Multilateral body agency	SLO	Organisation 13
14	Technical advisor	Government ministry	SLO	Organisation 14
15	Director	Independent power producer	PP-NE	Organisation 15

Participant index	Participant role	Organisation type	Sector category	Organisation reference
16	Chairman	Industry association	SLO	Organisation 16
17	Director	Independent power producer	PP-NE	Organisation 17
18	Analyst	Regulatory body	SLO	Organisation 18
19	Director	Regulatory body	SLO	Organisation 19
20	Director	Multilateral body agency	SLO	Organisation 20
21	Director	Energy consultancy	SLO	Organisation 21
22	Director	Regulatory body	SLO	Organisation 22

Source: Author's own compilation

Participants are referenced through their index and sector category in the remaining sections of Chapter 5 to ensure sufficient context when presented with sets of findings. For example, participant 22 is referenced as participant 22 (SLO).

Table 14 provides a summary of all organisations that were referenced by participants during their interviews. This reference mechanism is used when providing participant quotes in order to anonymise referenced organisations.

Table 14: Participant's referenced organisations

Participant	Organisation type referenced	Organisation reference
3	Research institute	RefOrganisation3_1
	Energy producer	RefOrganisation3_2
9	Energy producer	RefOrganisation9_1
	Industry group	RefOrganisation9_2
13	Multilateral body	RefOrganisation13_ 1
	Energy producer	RefOrganisation13_1 1
14	Energy producer	RefOrganisation14_1
	Government ministry	RefOrganisation14_2
15	Mobile telecommunication company	RefOrganisation15_ 1
	Fibre telecommunication company	RefOrganisation15_ 2
	Telecommunication company	RefOrganisation15_ 3
16	Government ministry	RefOrganisation16_1
	Government ministry	RefOrganisationa16_2
	Power producer	RefOrganisation16_3

Source: Author's own compilation

5.3. Presentation of the interview findings

The findings for the interviews are presented and discussed according to the theoretical categories and themes presented in Chapter 2. These categories and themes were mapped to the research questions in Table 10 of Chapter 3. The findings are also categorised according to new entrants, incumbents and SLOs. In certain instances, evidence for a particular sector category, such as incumbents, may be provided by new entrants or SLOs, due to the interconnected nature of the energy sector.

A summary table is presented at the end of each theme and section, with Harvey balls used to represent the significance of the impact of a specific factor for participants' sector categories. The results presented in these summary tables represent an interpretation of the data. Given that this is a qualitative study, it is challenging to ascertain conclusive aspects of the data with accuracy.

Figure 7 presents the structure that is followed for the remaining sections of Chapter 5. Each theme was analysed and discussed within a theoretical category. The process was iteratively progressed until all themes within a given theoretical category, and all theoretical categories were completed.

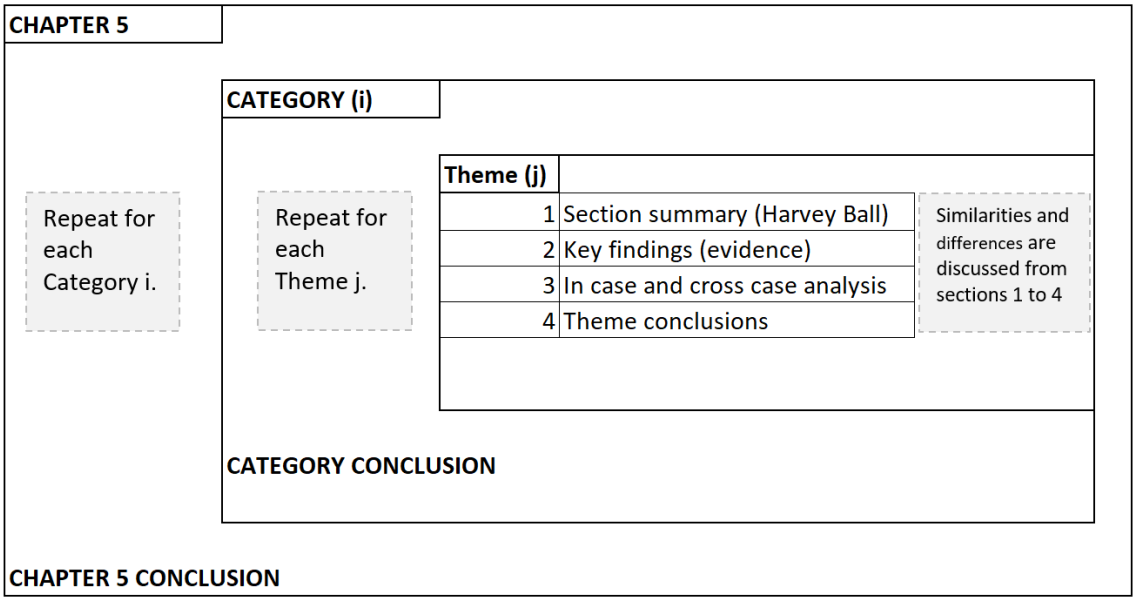


Figure 7: Chapter 5 structure

Source: Author's own compilation

5.4. Category 1: Contextual factors

5.4.1. Category introduction

The factors identified through the research findings are categorised into institutional and economic/market factors (Zhao et al., 2017) and discussed under the category of contextual factors.

5.4.2. Theme 1: Institutional factors

5.4.2.1. Theme summary

Table 15 provides a summary of the institutional factors impacting sector participants.

Table 15: Theme summary – Institutional factors

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Institutional factors	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.4.2.2. Key theme findings

New entrants

Participant 17 (PP-NE) noted that the international conglomerate firms held a track record which South African firms must compete with:

> *All these international conglomerate firms in South Africa already and have a fairly good track record. And then you have got a whole bunch of local large, medium-sized, small-scale energy companies.*

Incumbents

Participant 17 (PP-NE) indicated that the finance landscape was becoming increasingly difficult for incumbents to navigate:

You see the institutional finance is now pulling out. Wall Street funds in Canada and France and Switzerland, are all pulling out of funding fossil fuels, so coal and oil and so forth. All pulling out of these funds. You know, they've got mandates to say you guys have to stop investing in fossil fuels. So, where does that money now go? And they have got a new mandate to invest in renewables.

Participant 9 (PP-INC) noted climate change and stakeholder demands as an enabling factor towards their organisation meeting its strategic outcomes: "The biggest one is climate change. You know, the market, the customers, all the stakeholders, demand decarbonisation".

Participant 9 (PP-INC) also noted their sector to be in the process of changing its consumption of energy towards renewable energy in support of its sustainability commitments:

My organisation do not see ourselves in the production of renewable electricity, so it will be more either taking equity for self-supply, or just procuring renewable energy over the grid, from independent power producers. So it is to cut scope to emissions and meet our long term sustainability targets that we've given now to the market.

Quite interestingly, participant 16 (SLO) highlighted that the fossil fuel industry still had political support:

I think external challenges is specifically seated in the strength of the fossil fuel lobby in the country, inclusive but not limited to the [RefOrganisation16_1], who wants to protect the fossil fuel lobby and therefore is trying to keep renewals out of the mix as long as possible, although [he] understands that it is inevitable. [He] is still trying to make it difficult for renewals to become part of the energy mix. So the fact that the government is not following through on its own energy policy on the 1998 energy white paper by ensuring that there is an updated IRP that is updated every two years and that keeps with the times, and the fact that there is a … in the policy and regulatory environment, especially in the regulatory environment, a lot of obstacles for licencing of power plant, makes it very difficult for other players than [RefOrganisation16_2] to actually build a plant and put electrons into the grid.

SLOs

Various SLO participants cited that an enabling factor for their organisation's strategic

outcomes was that South Africa was a signatory to the Paris Climate Agreement. Many SLOs were also directly instrumental in assisting South Africa in meeting its commitments to the Paris Climate Agreement. South Africa had created the REIPPP programme in response to the global renewable energy transition.

Participant 13 (SLO) elaborated on the recognition that South Africa received for the development and rollout of the REIPPPP:

> *This is a public/private initiative, and it's been lauded, for example by the World Bank as the most, back then in 2016 I think, lauded by the World Bank as being the most accelerated renewable energy drive, most certainly on the continent and possible globally in terms of amassing, in terms of putting it up so quickly after COV17 and bringing in the kind of investment that was required.*

Participant 14 (SLO) highlighted that their organisation recognised government providing an incredible impetus for the transition: "I would just say again, government's policy is really pushing other departments now to act and to move into this space that is changing".

Participant 19 (SLO) noted the role of a regulator in facilitating the renewable energy transition: "So they've got a bank of questions that supervisors can use in particular when we deal with these climate risk type of matters and influencing entities to move away from high-carbon investments to these renewable types of investments".

Participant 19 (SLO) also reiterated the international and legislative developments that facilitated the renewable energy transition:

> *… there's a massive future for it, one because of this international drive and international pressure to lower the carbon footprint and renewable energy does provide that, the other, why I also think there's a massive future for it is, well government already in its last, or the mid-term budget speech by the Minister of Finance did allow renewable energy to sell energy to our energy producer, which is coal-based, so I guess this will just become more and more as we go along.*

In addition, participant 19 (SLO) highlighted the regulatory pressure on the retail sector:

> *…we can just also see how big the retail sector is moving towards renewable energy with the amount of solar geysers being put up, or solar panels being put up to replace the traditional production of energy as well as the amount of investments at the moment that is allocated into renewable energy projects from*

being it wind farms to solar panel farms etcetera.

Furthermore, participant 7 (SLO) highlighted that being a statutory organisation was an enabling factor in meeting its strategic outcomes:

> *…given the fact that the organisation is a statutory body, and is a regulator, I mean that in itself is a factor, because I think there is a statutory obligation for institutions that are supervised to comply with requests that a supervisor or regulator may ask, I mean providing those requests are within the line or within the scope of the Statutory Mandate.*

Most notably, participant 16 (SLO) noted the regulatory pressure that faced a particular incumbent power producer (participant16_3), resulting in the unbundling of that incumbent's vertically integrated model to democratise the energy landscape in South Africa.

5.4.2.3. Discussion of key theme findings

All sector participants were affected by the renewable energy transition regime change, at an international and national level.

New entrants found themselves competing against other new entrants, some of whom were conglomerates with track records in the industry on an international scale. Furthermore, the institutional finance landscape was changing and demonstrated lower investment appetite levels for incumbents linked to fossil fuels, yet an increased appetite for those businesses linked to renewable energy.

Indeed, all participants noted the regulatory pressure faced due to the renewable energy transition, with new entrants enjoying the benefit of a generally supportive institutional environment and incumbents facing regulatory pressure to decarbonise. Both incumbents noted by participants were observed to be in the process of changing elements of their operations towards decarbonisation or related to other institutional pressure points. Incumbents within the fossil fuel industry still had political support.

SLOs were also significantly affected by institutional pressures. However, this institutional pressure differed to the type faced by that of new entrants and incumbents; SLOs faced pressure due to the sectoral level relevance of their roles in facilitating the renewable energy transition.

5.4.2.4. Theme conclusion

Both new entrants and incumbents were impacted by international agreements and national programmes supporting the renewable energy transition.

However, new entrants were found to benefit from a generally supportive institutional environment, due to the international drive and pressure towards the renewable energy transition, whilst incumbents were under significant regulatory and institutional finance pressures to decarbonise their operations. On the other hand, new entrants also faced pressure from international conglomerate participants due to their successful track records. Furthermore, new entrants were mostly affected with respect to credibility and relied on support from established names in the industry to progress their operations.

Incumbents were observed to modify elements of their operations in order to achieve forms of decarbonisation, given stakeholder demands. It was also observed that the fossil fuel industry still maintained political support within the institutional landscape.

SLOs were also observed to face institutional pressures, although this differed from the type of pressure faced by new entrants and incumbents and related more to their sectoral level roles and relevance in facilitating the renewable energy transition.

5.4.3. Theme 2: Market factors

5.4.3.1. Theme summary

Table 16 provides a summary of the economic/market factors impacting sector participants.

Table 16: Theme summary – Economic/markets factors

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Economic/market factors	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.4.3.2. Key theme findings

New entrants

Participant 2 (PP_NE) noted that political risk is managed through industry associations. Furthermore, participant 2 (PP-NE) emphasised: “we get feedback on what the industry needs and what our demands are in order for investments to be made”. Participant 2 (PP-NE) also cited policy uncertainty as the main factor, amongst others, creating challenges in meeting their organisation’s strategic outcomes:

> *Especially in our industry, the biggest challenge is policy uncertainty. … that was obviously seen when in 2015, the integrated resource plan was not enforced and power purchase agreements were not signed. And then the entire industry came to a standstill. … there’s many others such as exchange rate, fluctuation and skills development. I think as secondary factors those can be put on the list but they are reaching far behind the policy uncertainty.*

The financial markets were also highlighted as factors to be considered for the energy sector. Participants 2 (PP-NE) and 9 (PP-INC) noted foreign exchange rate risk whilst participant 10 (SLO) noted commodity risk as factors impacting energy operations. Participant 10 (SLO) emphasised the role of oil in the energy markets: “I think oil price is important as an external factor. It’s something that plays into the economics of the energy sector”.

Participant 6 (SLO) highlighted the margin pressures within the solar industry and stated that the solar industry “…is a good thing for the customer but it is not a good thing for the players in the industry because there is constantly margin squeeze”.

Various participants also noted the decreasing costs of renewable energy technology. Furthermore, participant 2 (PP-NE) cited the lack of sufficient customers in the market: “…because there are not many customers in the marketplace, so we can’t afford to lose just one of them”.

Furthermore, participant 6 (SLO) highlighted that the markets were “extremely competitive, customers are shopping around for the best deal”.

Participant 15 (PP-NE) emphasised the developments around wider acceptance of renewable energy technology as an enabling factor to their organisation:

> *I think some of the factors that are enabling right now is because the industry has*

been evolving, there is now an appreciation of what the technology is. Before, there was a mindset to think solar energy is still in pilot trial phase, but now as the market has begun to see more systems over, there's been an extortion of installations now for the past five years across the continent. ... It's not something now that's being experimented with.

Participant 2 (PP-NE) noted the challenges related to alternative sources of energy:

From my point of view, renewable energy is the only alternative to provide the majority of the energy demand going forward. The other technologies have flaws that will not allow them to attract bigger investments. Nobody will invest in big capacities of coal because of the environmental impact. As well, nobody will invest in big capacities of nuclear because of the risks and mainly the costs involved, it's not a profitable technology. So we have to make mainly wind and solar work otherwise there will be no electricity going forward.

Participant 11 (PP-NE) emphasised the need for customer education and acceptance related to the renewable energy transition, given its relative infancy in South Africa:

…customer education, you know, people aren't always that informed be it with residential or industrial or commercial scale. It's natural in South Africa, it's an industry that hasn't been around for very long, so to get people comfortable, it does take quite a lot of education and it naturally will take its time, but I think it's the same with any new industry that you need to convince people a lot more before they accept solutions.

Participant 17 (PP-NE) stated that the South African electricity sector went through a major transformation in 2020, with the government announcing critical legislative changes:

I think if we look at the various changes, and it is really happening under our feet as I mentioned, in Feb 2020, Ramaphosa spoke about, you know, various changes. Municipalities being able to provide their own, or buy their own power from independent power producers. Also talking about limitations when it came to the size of solar plants, which was set at one megawatt per site. All of these things between February and now, has become a reality. [RefOrganisation17_1]_is busy unbundling. The government has just released the statement to say that municipalities now can in fact buy power from independent power producers. Which is incredible because what that means is

that the South African electricity space has just become privatised. What I do also know is that there are wheeling organisations that have been granted licences to wield private power using [RefOrganisation17_1] grid to other off-takers across the country. So, while we are sitting here, and I mean we are talking about Feb, what is that? You know, seven, eight months, the entire electricity industry has gone through a major overhaul within a matter of months.

Incumbents

Participant 9 (PP-INC) highlighted that power purchase agreements are used as mechanisms through which renewable energy contracts are signed with renewable energy power producers:

> *…it allows the developer now to go to the bank and get the funding since he's got this guaranteed revenue stream to pay off the capital. You understand renewable energy has a huge capital component and very low variable costs. So the challenge is to get the funding and pay the capital back over the tenure. One can also, if you're prepared to pay more, you can make it shorter term. You know, you can go for a fifteen year PPA at the higher price, but all of them escalates over the term, so you know what your cost is going to be over the next fifteen years, or twenty years*.

Participant 9 (PP-INC) also indicated though that this presented risks given the dynamic nature of renewable energy developments

> *…that also brings a risk to the system, because the outside world is changing and you will be locked into a long term agreement, while you know, there may be new technology, the world may change. Power may become cheaper off the grid and then you're locked into this inflexible, long term contract. So there's a lot of risks to consider before one enters into such a long term agreement*.

SLOs

Various participants also noted the decreasing costs of renewable energy technology, with participant 6 (SLO) noting:

> *So since 2014 up until now, I am sure you would have been reading in the news that there has been a consistent and marked drop in the price of solar if you work it out as a cost per kilowatt. So much so now that the cost per kilowatt hour of*

solar is actually cheaper than coal as a cost per kilowatt hour and that is very very critical point to be able to cross. Because that point has been crossed, it is affordable as a technology to a far larger, broad base of potential customers.

Participant 20 (SLO) emphasised the need to align with the South African government in terms of its strategic priorities in order to be able to navigate the multiple demands faced:

…the whole [Organisation 20] system in South Africa has been revisiting our collaboration agreements with government, so we've got to keep taking stock of where the country's at, what the country's priorities are and respecting those priorities so a lot of the time our focus is on the one hand is to support the country in terms of its own agenda, its own social, economic and political objectives but it's also to introduce the country to things that are happening elsewhere that the country might not be taking note of.

Participant 7 (SLO) noted the economic and financial stability consideration towards climate risk: " … case in point would be financial stability, where climate risk, for example, have been looked at, you've got expertise in terms of economists that are now considering these questions which can possibly be drawn on".

Participant 7 (SLO) also highlighted the renewable energy transition's convergence with other global trends and indicated that "… there are definite anchor points to fourth and fifth industrial revolution type industries" for renewable energy".

Participant 3 (SLO) indicated that the environmental and technological elements of renewable energy must be considered together:

I need to incorporate it in my thinking, so renewables going forward are purely, if you don't want to do it for environmental reasons, you should be doing it because you going to run out of fossil fuels at some point and by the time you run out of them, renewables need to be a mature, cheap, comparable technology that can deliver the energy security that you need and that's why renewables going forward will have to keep growing. …. In order for it to be integrated into the space, a lot of arguments you'll hear will be things like well, you can't have solar energy when the sun's not shining or you can't have wind energy when the wind's not blowing which means you need to bring into the equation a storage component. So going forward renewables with storage are going to become a very big player in the energy space, they have to. There's no other way around

it.

Further to the aspects noted on storage by participant 3 (SLO), participant 4 (SLO) emphasised the advancements made with respect to increasing battery storage capacity.

Participant 8 (SLO) noted the apparent gap in manufacturing in South Africa:

> *…because in the renewable energy space, most of the technologies are not manufactured in the country even though there's now a start to work towards that. Which is why the [Organisation 8] has established a [REMOVED] which would qualify the import products but also test the correctness of the claims that are given.*

Participant 12 (SLO) reiterated this apparent manufacturing gap mentioned by participant 8 (SLO) and stated:

> *There's quite a few challenges when it comes to uptake of technology, a lot of technology is imported into the country. Looking at the solar energy space, you know, one of the things that I am of the opinion is that we should have initiated manufacturing in parallel to introducing the REIPPPP programme and years later when you reflect on it and looking at currently the economic situation in the country itself as well, we could've made inroads in that particular space and we could've used the rest of Africa as the potential market for uptake of the you know, solar panels for example because Africa is blessed with a lot of sun as well.*

The impact of legislation and policy on South Africa's renewable energy transition was highlighted by several participants. Participant 12 (SLO) acknowledged the role that the public sector played in the transition and stated: "It requires for the enabling environment to be created from the public sector perspective*".*

Participant 14 (SLO) further highlighted the impact and progress of legislation and policy:

> *In South Africa of late and like I've mentioned this year in particular has been very good in facilitating renewable energy. We've seen significant shifts which we haven't seen in the four or last five years, there's been some policy clarity on many of the aspects. We see the Regulator being more and more active, we see the Department of Mineral Resources and Energy issuing things that they haven't issued before like the Schedule two of the Electricity Regulation Act, amendments to the new Generation Regulations, [RefOrganisation14_1]*

unbundling through their roadmap, so there's significant changes this year that have happened in particular also the Risk Mitigation Independent Power Producers Procurement Programme which was issued and is currently underway. You have the Bid Window five which has been announced, it also issued a letter giving clarity on less than 10 megawatts, what are the implications and in terms of agreements. We see a lot happening in this space, people are becoming more and more aware and this evidence, this transition that we're talking about more and more towards renewable energy, but more than that, about cost of electricity, different options regarding electricity, people are more … we see cost of supply studies happening in municipalities and even [RefOrganisation14_1] itself. We see reviews of electricity regulations and policies happening, even the [RefOrganisation14_2] Strategic Plan looks quite promising, so there seems to be quite a bit of movement this year which is heartening and really speaks to this opening up of the renewable energy space. So from a future perspective, it does look like in South Africa, we are moving more and more towards renewable energy.

Participant 21 (SLO) highlighted the importance of government and private sector alignment:

…the industry will continue to grow assuming that decisions by Government and private sector are objectively made and not influenced by other agendas that aren't aligned with procuring affordable electricity that's low emissions and creates lots of jobs. So as long as Government is aligned with those goals and decision-makers have those same goals in mind, then the industry will continue to grow.

Participant 12 (SLO) noted that the Carbon Tax Act was issued "in determining what the ceilings would be for carbon emissions that would be allowed by industries, the sectors".

Participant 13 (SLO) cited the regulatory measures as creating challenges in delivering organisational outcomes:

I think what has also been difficult of course, is some of the gaps in the regulatory environment, particularly clarity on the actual tariffs and the licensing systems. I know there are lots of discussions with [RefOrganisation13_1] at the moment, but those are some of the main areas that we see as problematic.

Participant 9 (PP-INC) reiterated the issues and need for further work on tariffs: "… one now needs to make a call on possible tariff restructuring in the pipeline. You know, [RefOrganisation9_1] also will have to restructure their tariffs if renewables, if there's deeper penetration of renewables".

Participant 9 (PP-INC) noted that new regulations allowed large corporations to consume power directly from IPPs:

> …large corporate entities can purchase electricity for our own use without the need for a ministerial deviation order, and there's also no top limit. So we're allowed to do bilateral transactions, large power users signing up with an IPP and bring the power in.

It was noted that the competitive landscape also included a multitude of international and local players in South Africa. Participant 17 (PP-NE) worded it as follows:

> *…energy in South Africa, is really competitive because you have got the international role-players, you know, the … and the, you know, everyone, the Chinese, Spanish, American. …. All competing for the same pot at the same time the pot is insignificant, but on the other side it is moving at a rapid pace.*

Participant 21 (SLO) added that their organisation worked on policy issues to identify and unlock barriers for the private sector participants:

> *So the external factors there would be the market forces and a lot of that has to do with Government regulations and policy. So fortunately, I do plan those spaces … so we can try to work to and open and unlock barriers for the private sector and some cases within policy.*

Participant 13 (SLO) noted the progress made on the REIPPPP and the opening of the new bid window:

> *...we're very welcoming of the fifth window of the REIPPP in 2021…this calls for concepts and for proposals, we hope will meet the targets of the 2019 integrated resource plan in a more coherent and faster manner.*

SLO participants 10, 12, 16, 19 and 21 all referred to the impact of the renewable energy transition on the energy sector's job market. Various participants indicated that there were several jobs opportunities from the renewable energy sector; however, due to disinvestment in the fossil fuel industry, it would also face retrenchments.

Participant 1 (SLO) highlighted the population growth as a critical social factor for the renewable energy transition: “just the fact that we have sort of seen this increase in population growth … massive increase in population growth the fact that we need … new innovative ways of providing a lot more electricity for a lot of more people”. Participant 12 (SLO) also noted the social benefit of the renewable energy transition:

> *… for the majority of the population in the country, it definitely provided some safety or security from an energy perspective and if you look at the United Nations principles and also related to the SDGs on energy security, you'd see just providing energy security to household how it unlocks all the other options available to a household itself. So the social needs or social aspects definitely come to the fore in that regard.*

Participant 16 (SLO) further elaborated on the social benefits of moving to a distributed approach with the unbundling of the country's incumbent energy producer:

> *So, in South Africa, we have got a lot of rural communities living in abject poverty. Because they are excluded from the main stream economy. Mainly because the main stream economy is built in areas of high population density like Gauteng, like Emalahleni, Mpumalanga, Nelson Mandela Bay in the Eastern Cape, Cape Town and Durban. So there is a few centres where there is a lot of people. And then in the rural areas there is almost nothing left. So by taking renewable energy further, and following this distributed approach, a lot of the rural communities could become part of the main stream economy by ensuring that they become co-owners of the wind and solar assets. And where they can then be trained up also in terms of the formal economy and how that works while they got uplifted because of the economic activity and the funding coming to them.*

Participant 20 (SLO) highlighted the severe shortage of skills in South Africa as an organisational challenge:

> *…because our organisation seeks to enable government to; we provide support to both government and industry to do whatever they see us to in terms of some of their policy objectives but never the less I would say that in the landscape of South Africa we're talking about, I suppose the primary issue is skills. Do we have all the necessary skills but to be able to you know undertake the full value chain of renewable energy and I suppose I see it as an external issue because it's from my organisation's point of view it's not something you have control over. We can support it but it belongs in the domain of government, in the domain of the private*

sector and our educational institutions. Whether they all are you know equipped to deliver the necessary skills, so that we not just buying technology from other countries but we're able to actually participate throughout the value chain of manufacturing, localising and distributing, maintaining etcetera all forms of renewable energy.

5.4.3.3. Discussion of key theme findings

Both new entrants and incumbents were affected to varying degrees across market factors.

New entrants received the benefit of a generally supportive funding and legislative environment due to the overarching renewable energy transition nationally and globally (although the pace and nature of the regulatory enablement created uncertainty). New entrants were also favoured in terms of their ability to provide electricity to the rural areas; however, they still faced social pressures in terms of the resulting impact of job losses to the fossil fuel industry due to the renewable energy transition.

Incumbents faced pressures primarily from an economic perspective due to challenges with obtaining funding from institutional finance (due to revised investment mandates away from fossil fuels and towards renewable energy), an environmental perspective due to the impact of fossil fuels and also from a social perspective in terms of the costs and infrastructural challenges associated with fossil fuel-based electrification for rural communities. Interestingly, a comment by participant 2 (PP-NE) around industry participants' demands suggested that new entrant sector participants may use their investments as leverage in order to influence specific legislative outcomes.

SLOs were observed to be impacted primarily in their ability to facilitate the renewable energy transition (such as that of providing an enabling public sector environment as it related to public sector SLOs) and also, to manage across the competing tensions of the renewable energy transition, such as the economic, social and environmental impacts noted for new entrants and incumbents.

5.4.3.4. Theme conclusions

All sector participants were affected by market factors to varying degrees. New entrants and incumbents were heavily impacted by economic and regulatory/legislative factors. New entrants were also observed to face pressures related to establishing credibility within the industry. Conversely, SLOs appeared to be less impacted by economic factors but faced environmental and social pressures given their role towards sectoral level

facilitation of the renewable energy transition.

5.4.4. Category conclusion

New entrants were found to have been primarily impacted by market factors and less so by institutional factors. Incumbents were found to have sensitivities to both institutional and market factor impacts, across funding and regulatory pressures on the institutional side as well as social and environmental pressures on the market side. SLOs experienced moderate pressures and impacts from both institutional and market factors.

Table 17 presents a summary of the contextual factors discussed and indicates the themes that are discussed in Chapter 6.

Table 17: Summary of contextual factors

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Context	Institutional factors	●	●	◑
	Market factors	●	●	◑
Legend		○	◑	●
	Theme/s to be discussed in Chapter 6	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.5. Category 2: Dynamic capabilities

5.5.1. Category introduction

The themes, sensing, seizing and transforming, are discussed under this category of dynamic capabilities.

5.5.2. Theme 1: Sensing

Many of the institutional and market factors discussed in Section 5.4, were articulated by various participants and were cited as either an enabling factor or challenge to their respective organisations' strategic outcomes. A summary is provided of overarching developments in this section to demonstrate the sensing processes falling within the dynamic capabilities framework**,** ensuring awareness of environmental developments for the participants' respective operations.

5.5.2.1. Theme summary

Table 18 provides a summary of the key findings for sensing.

Table 18: Theme summary – Sensing

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Sensing	●	●	●
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.5.2.2. Key theme findings

New entrants

Most of the specific process observations were articulated in section 5.4.

Participant 15 (PP-NE) highlighted the identification of a significant opportunity, missed by other market participants

> *So what we have found initially, was when this was happening in the beginning, people were focussing on two main areas; one, the very big place like the REIPPP programme, you know, I'm sure you know about the REIPPPP programme, the big … plants where people are building a hundred megawatts solar plants in the Northern Cape there…. And also on the other side, where you have the small solar home systems, … where it's like a hundred watts system, small lithium battery and some LED lights for lighting, charging cell phones and laptops where they're called small home solar system, but in Africa at the time, there weren't really people focussing on what we call the missing middle. This was the commercial industrial space whereby you would generate, maybe, design and build a PV plant to power a shopping mall, a school, an office park and things like that. And this was a pan-African vision, right across the continent, so that's where we chose to play in that space, direct to the customer*.

Incumbents

No specific process observations were noted further to all the elements articulated in

Section 5.4.

SLOs

Participant 1 (SLO) cited South Africa's involvement in international developments as a mechanism that helped them navigate multiple demands and scan for developments; "…the benefit of having international involvement, so scanning the perimeter…. So I think that helps our ability to navigate into this program as well and just also the fact that the knowledge of the international developments and learning". Similarly, participant 20 (SLO) cited their organisation's international network and knowledge of international technical developments as a key factor that enabled their organisation with the renewable energy challenge:

> *Well, having the factors that enable us to do whatever we do, whether it's in the renewable energy space or any other area of work that we do, it's that we have an international network of knowledge and skills and technical capability to give support, so for just to give you an example what I mean, we've been running an industrial energy efficiency project in South Africa for I think it's about 6 years now and we were able to bring in both money and expertise, technical expertise to train up and some of the best trainers in the world initially, to train up people in South Africa to do the work that they did and therefore expand that training and capabilities to the rest of South Africa so we've done quite a lot of important work in the industrial … space so I imagine that with regard to renewable energy, as that door opens further we again I believe can tap into our international network of either expertise or best practise from other countries and assist in the rolling out of energy of renewable energy in South Africa.*

Participant 10 (SLO) indicated that their organisation used their published white paper to demonstrate the long term strategy to guide the industry on future developments. Furthermore, participant 10 (SLO) highlighted these processes undertaken to arrive at the white paper:

> *I think our [reference removed] white paper is definitely a long term strategy that helps us to also articulate what, what the future's going to bring. So we're a forward-looking department very much. And another tool that has informed our [reference removed] policy has been fore sighting exercises. So we commissioned the [RefOrganisation10_4)] to do a foresight study that informed our [reference removed] White Paper. So from the policy perspective, we've got these strong policies that guide … our planning*.

Participant 12 (SLO) noted the synergies and processes from work undertaken by their organisation through cross-organisational coordinating, which allowed for the identification of challenges and forward planning on how to address them:

> *So even though the project would talk very well to the [RefOrganisation12_1] it sits with the [Organisation 12] but none the less we see the value add coming from that sector department, because of the cross-cutting nature of the work that we undertake we are able to bring the different role players to the table. This also includes the association for the [RefOrganisation12_2] as well that has recently been put in place. So providing the type of support to these external service providers through the project itself helps to also provide some sort of futuristic thinking on where some of the challenges may arise and how can we address it as a collective. So that becomes an advantage.*

Participant 12 (SLO) also indicated that pilot demonstrations are used to run through scenarios and test in their organisation:

> *So as far as possible with the work that we undertake, we try to ensure that you know this is where we heading to and this is where we see the private sector playing a role. So the activities that we demonstrate through these pilot initiatives is to provide a kind of window of opportunity on what the future may look like if we had to demonstrate it at scale or roll it out at scale*.

A recurring theme across most participants was the constant need for prioritisation given continual developments. Participant 13 (SLO) noted:

> *We also are cognisant that we constantly need to prioritise the shifting priorities that are very responsive to shifting operational or operating contexts, so it's a constant dance of dialogue and prioritisation and this prioritisation and the fluidity thereof is quite important in terms of effective management and demonstrating to the government that we have our fingers on the pulse of things*.

Participant 20 (SLO) noted that one of its key functions is to help government anticipate changes: "I made is because we, we're a [categorisation removed] organisation, you also want to make sure that we are able to help the country see what's coming, what the rest of the world is doing and keep up".

5.5.2.3. Discussion of key theme findings

A recurring theme across participants was the need for awareness of environmental

developments that affected their operations. For new entrants, these primarily related to legislative requirements that allowed them to advance their operations and penetrate the market, such as the REIPPPP's bid windows or the new regulation passed that allowed IPPs to provide power directly to large corporates. Incumbents also referred to sensing processes related to regulatory developments. SLOs demonstrated their sensing processes with knowledge of and participation in international platforms and the shifting priorities of government that changed their operational and operating contexts. Other SLOs remained close to technical developments, particularly so, given their respective organisational strategic outcomes.

5.5.2.4. Theme conclusion

All sector participants demonstrated significant sensing processes to varying degrees and purposes.

5.5.3. Theme 2: Seizing

5.5.3.1. Theme summary

Table 19 provides a summary of the key findings for seizing.

Table 19: Theme summary – Seizing

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Seizing	◑	◑	●
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.5.3.2. Key theme findings

New entrants

Participant 17 (PP-NE) provided their organisational strategy around mobilising people with the right skills:

> *… one thing that I feel we have done well as a company is choosing the right people. So, we really hand-picked top engineers, project managers, support staff, finance people, business development executives and so forth, that come from,*

you know, that are really high pedigree sort of individuals, coming from international firms and having a lot of experience and academic qualifications and so forth. And that really, you know, when you're faced with a challenge, getting people like that around a table, nine times out of ten, you will have some sort of solution on the table. So internally, I feel that our internal aspect that assist us in overcoming our challenges is having a solid team, effective, highly skilled, sharp team around us that can assist in getting through all of these challenges.

Participant 2 (PP-NE) further added to the organisational strategy related to resource mobilisation:

…in terms of our internal factors, we employ the right people, we do train people, we work on the team structures and we make sure that our teams are motivated and that they know each other well so that they can cooperate. . … So if the right people with the right qualification and the right mindset come together, then the services will be delivered.... So we must match the right skill with the right equipment.

Participant 15 (PP-NE) noted that an enabling factor for their organisation was the ability to leverage their footprint in the mobile telecoms and telecommunications fibre network companies within their broader technology conglomerate to benefit their renewable energy business; "So that experience of managing those type of micro-grids is what's making it easier for us to replicate that in the solar space across the country, continent, leveraging on our existing network and footprint".

Participant 15 (PP-NE) further elaborated on being able to seize the identified opportunity:

So because of all our other businesses we would then obviously have done research, let's say we want to open a solar business in [country 1], in [country 2], in [country 3]. We obviously have our business development team and our research team will address … some market studies, some market research. So leveraging on that, it's easy for us to pivot, looking at the trends of where things are going. So that's one of the other key advantages as well. So those are some of the internal things that we can ride on, to sort of like unlock value and maximise benefit.

Incumbents

Participant 9 (PP-INC) noted that engineering competence might be obtained externally to the organisation, should the skillsets not reside within the organisation:

> *Well, we [Organisation 9] have the engineering horsepower to do projects like this so, you know, if it's a big multinational industrial company, there's some in-house skills. One can also contract that in if that is not in your field of expertise.*

SLOs

Participant 13 (SLO) highlighted the need to mobilise resources across its internal and international network and manage partnerships in supporting the South African government in its renewable energy transition:

> *…the resources that we leverage are largely through the mobilisation of technical support to the government of South Africa, we also form partnership, very, very strategic partnerships to ensure that there is real change on the ground.*

Participant 13 (SLO) also noted:

> *…I wanted to make about the resources that we leverage is that we do so using the might of the [Organisation 13] and its knowledge and experience gained in the [figure removed] other countries, most of which are probably facing similar or related problems to renewable energy expansion like South Africa. It's not new in South Africa.*

Participant 3 (SLO) highlighted the need for cross-organisational partnerships to leverage and complement skills and contracts to manage those arrangements effectively:

> *Our technical people are well connected so we do leverage against relationships that are in technology spaces that we already have. Again, what we punt is not duplicating work so being able to work together so for example, I'm using an example, we work closely with the [RefOrganisation3_1]. They have a certain skill set we have a certain skill set that complement each other, so we don't duplicate work. We actually complement each other's skillsets in order to deliver more work by pooling our resources and the way that we manage that, because you said how do we manage? It is actually just very good interpersonal relations, as well as good contracts. Good contracts make for good neighbours.*

Donor organisations were also noted to alleviate some of the funding constraints experienced by SLOs. Participant 14 (SLO) explained this as follows:

> *Fortunately, there are quite a number of donor organisations and you know funders who want to assist and to provide research, they really want to partner with government organisations to assist in research without any conditions attached. So our organisation leverage is off that and uses the funding and the resources from these donor organisations to meet certain policy objectives, do research.*

Participant 1 (SLO) noted that research expertise is sourced externally to assist with risk assessments conducted by their organisation: “it will be part of the research .... In some cases we might need sort of external expertise just to actually help with certain aspects of sort of researching this area”.

Participant 12 (SLO) noted that a key part of their organisation was the facilitative role played and the mobilisation of formal and informal resources for specific renewable energy transition initiatives:

> *So the facilitative role that we play then would be key for us to unlock resources that we would you know move forward towards a particular project ensuring that there’s necessary engagement on the ground, bringing in aspects where we want to address the social aspects or environmental aspects which is always as the forefront for us and then also unlocking potential economic activities that may happen post the project closure. So if you’re looking at this informal settlement, one of the key things was the maintenance of the solar panels … provided and as a result people were capacitated from the community itself and they were able to roll out the service post the closure of the project.*

Participant 22 (SLO) indicated that Organisation 20 considered peripheral impacts of and to the renewable energy transition and configured multidisciplinary teams working across the organisation to come together and contribute collectively to the agenda based on their respective programmes.

> *We don’t have dedicated resources to this issue given the fact that as I mentioned earlier on this is not central to the work that we do. It is peripheral, it has implications for objectives that we are trying to achieve but it is not core in terms of influencing our mandate….So essentially what would happen then is that you would have representatives sitting in, in fora looking at these issues through the*

lens that they operate from their respective line departments. And then what we tend to do is we tend to create a platform at the [REMOVED] where we pull together all these resources or we provide a platform where all these different individuals can come together and basically share their experiences and share their work that they are doing in their respective silos or in their respective work group. In that way what we aim to do is to gather economies of scale and also assist us in prioritising and focusing on some issues that we think South Africa and the [Organisation 20] should more actively engage on. So we hope that by sharing this information, creating this platform where we get this, these different individuals coming together this provides us at least with an opportunity to give more focused attention to some of these priority themes or objectives that we are hoping to achieve in this area.

5.5.3.3. Discussion of key theme findings

All sector participants were found to mobilise resources towards the achievement of specific strategic outcomes. SLOs demonstrated the most prominent mobilisation characteristics given their cross-organisational and international networks. New entrants and incumbents leveraged resources purely through new hires or contractual agreements.

SLOs were found to leverage and mobilise resources, funding and complementary partnerships to a far greater extent than power producers. A key observation related to the ability of SLOs to mobilise resources and partnerships was due to pre-existing and wide networks across organisational boundaries and geographies.

5.5.3.4. Theme conclusion

All sector participants demonstrated evidence of seizing processes. New entrants and incumbents demonstrated relatively undifferentiated and moderate levels of seizing whilst SLOs demonstrated the most prominent seizing capability, process and activity.

5.5.4. Theme 3: Transforming

5.5.4.1. Theme summary

Table 20 provides a summary of the key findings for transforming.

Table 20: Theme summary – Transforming

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Transforming	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.5.4.2. Key theme findings

New entrants

Participant 2 (PP-NE) noted their organisational shift from project management to an independent power producer:

> *We are since about eight years shifted from project development to the operation of renewable energy power plants and we are striving to operate power plants in the most efficient way so that the electricity is generated at the lowest cost and at the lowest impact to the environment.*

Similarly, participant 11 (PP-NE) noted their organisation's broader strategic objectives to move and deliver across the value chain:

> *So strategically my company, our vision or let's call it our mission, is to revolutionise Africa's sustainability, so in a sense you know that's our large vision statement and it's not necessarily confined only to renewable energy, it includes energy efficiency, sustainability solutions, obviously solutions that have a strong emphasis on alternate energy, renewable energy and green energy or green technologies. So, I would say that really is the driving strategic objective in our company currently.*

Participant 17 (PP-NE) noted that scaling up their operations was a critical response to being able to deal with the demands:

> *There is a huge amount of demand …, us scaling up in order to be able to deal with that demand which is what we have been doing for the past two years, and what we are doing currently. And so the one side is just being focused on what*

we should be responding to, being very specific and then also the second part of that is making sure that we have a big enough team and a proper support function in order to capitalise on this huge demand, which is also something that we have been doing.

Incumbents

Participant 9 (PP-INC) highlighted that whilst their organisation was not a producer of renewable energy, they consumed large amounts of electricity and therefore, needed to meet sustainability targets with respect to decarbonisation:

> *[Organisation 9] is a very big user of electricity and also a very big co-generator of power. And as a result of the whole industry moving, you know, in the direction of energy transition, all of us are now very much involved in decarbonisation and looking at either investing, or procuring renewable energy. So [Organisation 9] has been looking at this for a couple of years now and I was involved with that as well. It is all about sustainability.*

Aside from noting that their organisation had moved towards self-sufficiency using renewable energy resources for energy consumption, participant 9 (PP-INC) stated that simplification was used as a mechanism to navigate multiple demands:

> *It is actually a challenge. We are currently in another big workforce transition, where we try to simplify and restructure again. We're also under cost pressure, so we de-layer and try to stay more focussed. So we are evolving from a more complex organisation to a very simple one where there's just two business units. There's [Organisation 9] [REMOVED], that looks at the South African businesses and then there's a [Organisation 9] [REMOVED] that will largely focus on [REMOVED] and then in the niche market. So we're trying to cope with all of these changes by simplifying and focussing better.*

Participant 9 (PP-INC) also highlighted the need for organisational efficiencies:

> *Well you know, it is this centralisation versus decentralisation, never-ending thing, but we had a previous reorganisation, not many years ago where the wisdom was that there's too much duplication. We should rather centralise and increase efficiency and increase expertise and that, but then you have more distance between the functions and the end user. So we now just going the opposite direction, taking the functions closer to the end user. And the whole idea with the category management or the procurement business is to get the three*

parties, you know, the end user, the supplier, and the commercial function very close to each other. So it's like a triangle that you shrink, and if those three parties are seeing the same truth and are close to each other, there's no layers of fat, that's when you unlock your efficiencies.

Participant 14 (SLO) noted that an incumbent power producer was also in the process of transforming its organisation, specifically in terms of moving towards renewable energy and associated technologies: "…even [RefOrganisation14_1] itself is wanting to procure greener electricity, looking at battery storage as well, so there is a move if you're looking at renewable energy".

Participant 5 (SLO) mentioned that various incumbent organisations on which he held board memberships had moved to a self-sufficiency energy model, which used low carbon-based sources to generate electricity for consumption:

I have been for [figure removed] years on the Board of [RefOrganisation5_1] and for [figure removed] years on the Board of [RefOrganisation5_2] and both these entities have done their own generation of electricity through the gas in the case of [RefOrganisation5_1] from renewable energy point of view self-sufficiency and [RefOrganisation5_3] has done it from the residue when they debark a tree and the leaves and all the other residue that has been used to fire up the boilers to generate electricity.

SLOs

SLOs were found to primarily transform with respect to specific projects. The evidence is provided under Section 5.6 on orchestrating mechanisms.

However, an interesting observation emanated from participant 4 (SLO) related to the exploration of a particular technology within their organisation that expanded to a point where it could not be funded; therefore, the exploration led to the generation of a company to progress it.

You know it's the ... say the … environment is not typical of the company in that sense but for example on the … that project has gotten to the point where we cannot fund it internally in the [REMOVED] and so in that case we've actually spun out a company to raise venture capital to drive the projects.

Participant 10 (SLO) indicated Organisation 10 had constituent institutions that report into its structure, which allowed Organisation 10 to focus on meeting its mandate:

I think what's really interesting about the [Organisation 10] is that we are required to, in terms of our mandate, we work across sectors, so we have the benefit of working with many other … departments. We've got strong coordinating teams. So we've got a really strong internal ability to coordinate and understand what's happening in the [reference removed]. We also work with some really great entities and institutions that enable us to deliver on our mandate. So I think institutions that have been built up over a number of years, the likes of the [RefOrganisation10_1], the [RefOrganisation10_2] and the [RefOrganisation10_3], all entities that report to the [Organisation 10] means that we do have an ability to allocate funding strategically and according to our mandate. So that helps us to deliver on our objectives. And it means internally that we can, as a department, focus on prioritising project management and delivering on … our mandate

Participant 12 (SLO) provide key insights into transformation initiatives being conducted for municipalities:

We've undertaken some preliminary pilot projects as well in that particular area and have found that we could have some quick wins with regard to some short-term investment that looks at revamping these huge infrastructure that's sitting in many municipalities and actually be able to self, become self-dependent from the perspective of generating energy which these plants actually have to be powered up 24/7. So becoming independent of supply from the grid itself and lowering their expenses for the municipality.

Participant 6 (SLO) identified and constructed a business model that leveraged a core competence in finance, outsourcing arrangements and supply chain and started a solar energy consultancy. This model included lead generation, outsourced design, outsourced engineering, procurement and construction (EPC), and renewable energy gear imports.

… with that in mind and my financial background it was very easy for me to just naturally move from being finance to becoming a solar energy advisor if you will in this business and do these projections to help show corporates exactly what this technology is that they are actually buying and why it matters so much. So particularly to the FDs and the CFOs and the MDs and CEOs. The company that I started didn't actually build solar systems themselves, they were actually outsourced to my partner who did the designing and even from there we actually

outsourced it to specialist EPCs called Engineering, procurement and construction and these are the companies that are actually the importers of the gear. They have the technical expertise and engineers to actually get onto the ground and install the inverters and do the connection to the transformer boxes as well as installing the solar panels to the roof.

5.5.4.3. Discussion of key theme findings

Both new entrants and incumbents were found to have significant transformation programmes in their respective organisations. New entrants sought to transform their organisations to expand across the renewable energy value chain whilst incumbents were seen to transform their organisation to incorporate the use of renewable energy into their operations, citing this as self-sufficiency with respect to energy consumption. Incumbents had also undergone a transformation to drive efficiencies.

SLOs were found to transform by employing resource and asset orchestration when partnering across organisational boundaries and geographical locations. This is addressed under orchestrating mechanisms. Furthermore, participant 6 (SLO) identified a business model with outsourcing and supply arrangements and started a new business.

5.5.4.4. Theme conclusion

Both new entrants and incumbents were found to transform by realigning structures. SLOs were observed to transform when partnering across organisational boundaries and geographical locations. Furthermore, SLOs were also found to leverage outsourcing arrangements.

5.5.5. Category conclusion

All sector participants demonstrated dynamic capabilities (sensing, seizing and transforming). However, the findings were not uniform across sector participants and each dynamic capability, demonstrating varying degrees of capability, activity, impact and need.

Table 21 provides a summary of dynamic capabilities and indicates the themes that are discussed in Chapter 6.

Table 21: Summary of dynamic capabilities

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Dynamic capabilities	Sensing	●	●	●
	Seizing	◑	◑	●
	Transforming	●	●	◑
Legend	Theme/s to be discussed in Chapter 6	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

5.6. Category 3: Orchestrating mechanisms

5.6.1. Category introduction

The theme of the ability to combine selected resources is discussed under this category of orchestrating mechanisms.

5.6.2. Theme 1: Ability to combine selected resources

5.6.2.1. Theme summary

Table 22 provides a summary of the key findings for the theme ability to combine selected resources.

Table 22: Theme summary – Ability to combine selected resources

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Ability to combine selected resources	●	●	●
Legend	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

5.6.2.2. Key theme findings

New entrants

Participant 11 (PP-NE) noted:

I think it comes down to being able to assign responsibilities and delegate you know, where everyone is aware of their roles and responsibilities and you know, assigning people the right capabilities and experience to take on different facets in the company and different work strengths, so I think that is definitely one way. Then having the right systems and processes in place is another important one in the sense that helps guide the organisation along in terms of ensuring quality management, project administration and just being able to do things in a regular methodology. So, between the people, capacity and systems and processes, I think that's, and then I think good and efficient management and leadership as well is quite important so that things stay on track and you know, people are kept on top on things efficiently and effectively.

Participant 15 (PP-NE) stated that an enabling factor for their organisation was the ability to leverage their footprint in the mobile telecoms and telecommunications fibre network companies within their broader technology conglomerate to benefit their renewable energy business:

Factors that enable us, because we have a pan-African vision, our pan-African footprint, so [RefOrganisation15_2] is, the organisation is in about over twenty African countries in these forms. One, we have a mobile telecoms business called [RefOrganisation15_2], which is present in [removed country references]. And we also own the [removed due to an allusion to size] fibre company on the continent. It's called [RefOrganisation15_3] that now has, is almost close to reaching its goal of having fibre, or telecommunications fibre network from [removed city reference] all the way to [removed city reference]. So we just are able to ride on our existing footprint and leverage on that. For example, we are in [removed country references], as [RefOrganisation15_3]. Five years ago or so they bought [RefOrganisation15_4]. It's now called [RefOrganisation15_3]. So in all those markets we already have existing boots on the ground where we can leverage on our networks, our reach and also our experience. So because we are, we were a telecoms company, managing telecoms networks is essentially keeping everything up. Your internet and your connectivity must always be up. And to manage that uptime, it's essentially just managing a power business, and the power business for that critical infrastructure, it has obviously, having sort of like a redundancy set up. So, as we know the grid fails quite frequently then all our sites usually in the telecom space always need to have backup batteries and backup generators and also now, backup solar. So that experience of managing

those type of micro-grids is what's making it easier for us to replicate that in the solar space across the country, continent, leveraging on our existing network and footprint.

Incumbents

Participant 16 (SLO) explained the unbundling of an incumbent power producer's vertically integrated model and the new model adopted:

So vertically integrated is [RefOrganisation16_3] is a supplier of electrons, so they own and operate power stations. Then they also own the [removed] grid and they sell that electricity through the transmission and system operator which is part of [RefOrganisation16_3]. So, if you ask an [RefOrganisation16_3] board member would they, if they have a choice, would they dispatch private power versus [RefOrganisation16_3] power, they would always go for [RefOrganisation16_3] power first. That means they are conflicted in an environment where independent power producers also need to be dispatched. So that vertically integrated model should be changed and that is what is busy happening with the minister of public enterprises, currently driving with the [RefOrganisation16_3] CEO. The unbundling or divisionalisation of [RefOrganisation16_3] so that, what they call an independent transmissions system and market operator (ITSMO). The ITSMO would then buy electricity from different power stations which it doesn't own and it would then be able to choose from who to buy at the cheapest price at the right reliability quality of power. And also, green versus non-green. That would then lead to a much more balanced approach which is fair and equitable to everybody in the country.

SLOs

Participant 19 (SLO) said that a key mechanism to managing multiple demands was to have dedicated resources, processes and project management:

… it's a challenge, we do have resource constraints, we do have a lot of priorities that is conflicting etcetera, so by, I guess by putting dedicated resources to something like that, to drive it, to influence where influence is needed, to put the necessary guidance and requirements in place that is needed and that is properly managed through project management.

According to participant 13 (SLO), they provide management oversight to internationally mobilised resources providing micro-engineering solutions when developing mini-grids:

We know that there are a lot of debate in terms of patenting on renewable energy technology at least that which has been locally manufactured. Some of the patent issues involve micro-engineering solutions, I don't know the details thereof because we are not engineers, we work more in terms of management oversight of internationally mobilised resources for these technology solutions.

Participant 13 (SLO) explained that one of the strengths of their organisation related to its internal resource access and organisational cooperation framework within the multitude of agencies of its broader organisation:

… so I think one of the strengths of our organisation is that we're the premier development agency of the [Organisation 13] and so what that means is we have access to a whole bunch of resources and tools and instruments that enable us to introduce best practices and examples and case studies from other parts of the world. So we have a massive presence in well over [removed] countries of the world which means there's a multiplicity of experiences and insights that can be shared. So I think this is a big strength and a comparative advantage of our organisation. Another strength in my view or enabler to address some of the challenges that we face in renewable energy in South Africa, is the fact that the system itself, the [Organisation 13] system itself lends itself to collaboration. South Africa has [Organisation 13] agencies of the [Organisation 13] and so we are encouraged in our cooperation framework to collaborate very closely with other [Organisation 13] agencies that are highly specialised. So for example we in the case of the crises, the pandemic, right, we worked very closely with the [RefOrganisation13_1] in terms of ensuring that there was, that the lights were on in many of the rural areas, right so that these public health facilities could deliver services. And so co-joining activities on the ground and using the using the strength of the [Organisation 13] system, being able to use the strength of the [Organisation 13] system is really an enabler that helps us to address the challenges.

Participant 3 (SLO) referred to two enabling factors in their organisation around technical resources and teams. The first of these factors was a deeply networked and knowledgeable technical team:

…although we have a limited technical team as I said before, our technical people are very well known or well networked, well connected and knowledgeable in their spaces, so although we have a small technical team,

we are able to tap into resources and knowledge bases across the energy space.

The second enabling factor was the small size of the organisation [Organisation 3] that provided it with an advantage:

[Organisation 3] is not a very big organisation so because we small, we can move fast. We can operationalise and implement things in a swifter more efficient manner than for example a huge company you know like a [RefOrganisation3_2] or something like that you know and then you looking at thousands and thousands of employees and the supporting administrative structure and support functions for that whereas we are a small compact company. We can move fast and it allows us to be able to demonstrate technologies and prove concepts and business cases in a more timeous manner.

According to participant 12 (SLO), the development of the Carbon Tax Act (Republic of South Africa [RSA], 2019) resulted from a partnership across several governmental ministerial departments. Cross-sector partnerships were also noted as an essential mechanism moving into the future of renewable energy:

…to move towards the future as renewable energy being the future requires for planning that happens in parallel across different sectors so you're looking at academia and whether they preparing our future workforce accordingly based on what we are embracing as our vision for the country. It requires for the enabling environment to be created from the public sector perspective, it requires for the private sector to also open up for business with regard to manufacturing, if it's solar panels to invest accordingly as well and it's not about a blame game, it's not about you know whether the policy is in place or not and sometimes we do have policies in place, but we may not have critical partner coming forward, for example, the private sector because of lack of trust between the public and private sector and this has been seen on a regular basis. So as far as possible with the work that we undertake we try to ensure that you know this is where we heading to and this is where we see the private sector playing a role.

Furthermore, participant 12 (SLO) noted that the advancement of their organisational business processes certainly benefitting by looking outside of its organisational boundaries:

…so I think we do stand out as an organisation and based on the fact that we tend to embrace approaches that the private sector may undertake with regard to business processes you know that's definitely a positive for the organisation.

Participant 10 (SLO) stressed the need for internal coordination within Organisation 10, given the multiple objectives and priorities:

So the objectives under the peer of tackling poverty, inequality and unemployment means that there is constantly a battle to prioritize um many projects, um many development objectives, and that, that activity of prioritising is something that we are constantly needing to do. And, and I think that just itself, for any government department is challenging and we work across sectors. So for us, it's really important to be collaborating with other government departments. … we need to be coordinated internally.

Many participants indicated that partnerships were the most prominent feature and mechanism for addressing their funding and skills shortages. These partnerships ranged from combining resources across the power producers and SLOs, along with intra-organisational cooperation frameworks, as noted by participant 13 (SLO). Participant 4 (SLO) added as to another mechanism that SLOs leveraged: "almost all the tangible support comes from outside the [REMOVED] so it comes historically from industrial contracting. Currently, it is more dominated by long term [REMOVED] contracts so we are fortune too".

Partnerships arrangements were also noted by participant 13 (SLO) as a mechanism towards managing multiple demands:

I think we're also pretty structured in what we do in terms of the agreements we set up and day to day management in terms of assignment of roles and responsibilities, institutional arrangements and reaffirming the institutional arrangements in partnerships.

Participant 10 (SLO) indicated that Organisation 10 demonstrated strong coordination ability with the private sector to ensure that a specific strategic programme was delivered:

I think the strategic delivery of the [reference removed] economy work, which is flagship to the [Organisation 10] …, is an example of the ability of this particular chief directorate to leverage private sector engagement and their contribution to market development. It also means that as a directorate, they've got strong

coordinating ability to not just look at renewables, but look at the whole energy sector. So there's just really strong delivery in that department.

Participant 10 (SLO) further highlighted the characteristics and initiatives undertaken by their director: “a really good leader, policymaker, programme developer as well. And recently really making an effort to streamline, coordinate funding opportunities in the sector”.

Participant 10 (SLO) emphasised the importance of multilateral bodies collaborating with government departments. Participant 3 (SLO) noted the importance of partnerships for research and development institutions in the renewable energy sector, due to a lack of funding which creates organisational challenges:

I think there are multiple factors and I think if you ask anyone in the organisation remember [Organisation 3] is not just renewables. We are all energy except nuclear, so I’m going to answer on behalf of [Organisation 3]. We, I think if you asked anyone in the organisation, the biggest challenge would be funding because we’re a Research and Development and Piloting Institute. We also do skills development and capacity building and so forth. Our requirement for sort of large-scale demonstrations and showing that things can work and will have a business case and demonstrating economies of scale require money. So a lot of the time the way that we overcome this financial hurdle is to partner with multiple organisations that each have a contribution that they can make to a project and that way by pooling resources, we get more essentially more bank for your buck.

5.6.2.3. Discussion of key theme findings

New entrant participants 11 and 17 both indicated that they combined system and human resources in their products and processes. Furthermore, participant 17 (PP-NE) also indicated that their resources were combined across organisational boundaries (the holding company’s mobile telecom and telecommunication fibre network) and geographical locations to leverage their Pan African footprint, reach and experience to enable their renewable energy company.

One incumbent was noted to be in the process of unbundling their operations, resulting in a new transmissions business that could accept power generated from both the new and incumbent power producers. This represented an industry shift by letting new entrants participate in the energy sector. Participant 9 (PP-INC) indicated that resources were being combined at business unit levels to simplify the businesses and create

efficiencies due to cost pressures and multiple competing demands. The drive for efficiencies may represent a combination of resources across the corporate or business unit level boundaries and geographical locations.

Both new entrants and incumbents were found to have similar abilities to combine resources across organisational boundaries and geographical locations. The differences in these abilities were found to reside in the availability of pre-existing resources, such as those observed with participant 17 (PP-NE).

SLOs were primarily noted to combine technical resources across organisational boundaries and geographical locations and engage in partnerships across their respective networks in order to achieve specific outcomes.

All sectors' participants were noted to have the ability to combine resources in various manners. However, new entrants and incumbents were limited to their own organisations and expanse of their current geographical footprint (or deliberate partnerships) when combining resources. In certain instances, however, SLOs and PPs were also able to partner. In contrast, SLOs were noted to present with the deepest and widest flexibility when combing resources due to their pre-existing networks and non-competitive and sectoral level relevance of their work.

5.6.2.4. Theme conclusion

Both power producers and SLOs demonstrated resource orchestration to achieve different forms of change.

New entrants were found to use resource orchestration to achieve expansion or optimisation in their operations. In many instances, the resources selected and combined were leveraged across organisational boundaries and geographic locations. Incumbents were found to use resource orchestration to change their operations in support of decarbonisation efforts.

Many SLOs were found to use resource orchestration by leveraging and combining resources across organisational boundaries and geographic locations towards achieving specific objectives. In many instances, the resources mobilised were international and brought their experiences of developments in other countries that could be leveraged. The resulting resource orchestration configurations of these SLOs may have been temporary or permanent establishments.

5.6.3. Category conclusion

All sectors were found to use orchestrating mechanisms, with these mechanisms being used for different forms of change. New entrants were found to use resource orchestration towards expansion and optimisation. Incumbents were found to use orchestrating mechanisms for purposes of decarbonisation, which also resulted in transformational shifts of their operations. SLOs were found to primarily use orchestrating mechanisms to leverage technical knowledge and experience towards achieving sectoral level initiatives.

Table 23 provides a summary of orchestrating mechanisms and also indicates the themes that will be discussed in Chapter 6.

Table 23: Summary of orchestrating mechanisms

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Orchestrating mechanisms	Ability to combine selected resources	●	●	●
Legend	Theme/s to be discussed in Chapter 6	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

5.7. Category 4: Optimal distinctiveness

5.7.1 Category introduction

5.7.2. Theme 1: Stakeholder perceptions

The themes, stakeholder perceptions and tensions between differentiation and conformity are discussed under this category of optimal distinctiveness.

5.7.2.1. Theme summary

Table 24 provides a summary of the key findings for the theme of stakeholder perceptions.

Table 24: Theme summary – Stakeholder perceptions

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Stakeholder perceptions	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

5.7.2.2. Key findings

New entrants

Participant 2 (PP-NE) cited the lack of sufficient customers in the market and the mechanisms used to retain them:

> *Because there are not many customers in the marketplace so we can't afford to lose just one of them… As management, we want a functioning marketplace so we communicate and work together with our customers because when they are healthy and when they are functioning then we can work and we can invoice them and they can give us business. So we try to help them out beyond our scope of work to make sure that they are healthy.*

Participant 6 (SLO) further noted that certain IPPs took on additional costs to ensure the longevity of their business; a key mechanism leveraged in this instance was performance guarantees:

> *I think just another very important point that you must bear in mind which does help as an enabling factor if you will to ensure the longevity of your business going forward is performance guarantees. So what a performance guarantee is, if you put a system on a company or on a house's roof and you say that this system will generate X amount of kilowatt hours per day or per month and you actually do the post installation measurement and management and you see that this system is not producing that level what a company would do is that they will guarantee to put more panels onto the roof to help generate the levels that had been promised and those panels get put on to the roof at the cost of the company and not that needs to be paid extra for by the customer*.

Participant 17 (PP-NE) noted a strategic organisational outcome to be perceived as a trusted renewable energy company:

> *… that is really our strategic goal, is to be a, what we would deem a bankable EPC renewable energy contractor and player in this space. We also are, you know, we are also quite well versed in developing projects. And again, it is, we do not just say we're wanting to develop projects, but that it is coming with a back, with the support of the institutional finances. Whether it be commercial banks or international funders, institutional funders that know who we are, that is comfortable to put their money behind our projects. So that would be our strategic aim on our side.*

Incumbents

Participant 9 (PP-INC) stated that the stakeholders are driving decarbonisation which creates an enabling factor for their organisation:

> *The biggest one is climate change. You know, the market, the customers, all the stakeholders, demand decarbonisation. So this is one of the levers to reduce our carbon footprint. It's also about responsibility, nobody wants to be the cause of climate change so it's not all coming from outside, but surely the pressure is immense there's many pension funds that blacklist companies with big footprints. There's this border carbon tax that Europe moots about that they will not accept your products and if you're from a county with a higher carbon content than the European Union. So there's a lot of climate-related pressures from outside.*

The consideration of energy self-sufficiency was noted by participants 5 (SLO) and 9 (PP-INC). In these instances, the companies mentioned by participants 5 (SLO) and 9 (PP-INC) were producers of carbon-based energy or other products but had moved or were in the process of moving towards renewable energy sources in terms of their organisational energy consumption. Participant 9 (PP-INC) specifically emphasised that this was in line with their organisation's sustainability targets communicated to the market.

SLOs

Participant 12 (SLO) highlighted the strength of their organisation in mapping and leveraging stakeholders to assist their needs; "We're basically able to link the dots between the stakeholders as well as see where the needs are and you know redirect these types of resources as well to relevant recipients or beneficiaries who are looking

for such support".

Participant 12 (SLO) also noted the competing demands from their stakeholders:

> *It is quite exhausting though because many of the programmes that we coordinate, sometimes our partners are quite demanding with regard to the amount of time that we avail to those programmes without realising that we do have other competing programmes that also are equally demanding of our time*.

Participant 10 (SLO) highlighted the need to understand stakeholder health when evaluating the extent to which their organisation has achieved its intended strategic outcomes, as follows:

> *I think another area to look at is not just what we achieve on paper, but the, the partnerships and the scope of work that we are doing. So for me it means that we are not just ticking the boxes, but that we are also moving to engage various stakeholders, so our stakeholder engagement health, to me indicates our ability to also achieve objectives, because many of the areas in which we want to influence and impact South African society requires partnerships and collaboration.*

Participant 12 (SLO) stressed the importance of clear communication with stakeholders as being an enabling factor for their organisation:

> *…the key thing here is to ensure that you have the relevant stakeholders, you've communicated quite clearly and you have everyone engaged in that regard and also ensuring that you know you're providing the necessary feedback as and when required from a legal perspective ensuring that you have the paper trail in place and, yes, well those external factors are establishing relations, ensuring that you have governance structure that is meeting on a regular basis and you have all the external stakeholders involved in that process.*

Participant 12 (SLO) also noted the challenges of cross-sectoral coordination with stakeholders:

> *So the value addition that comes in is ensuring that we are able to create the necessary environment that would you know give us the headway in the different areas that we work in. I think the limitation is that we may be misunderstood as an organisation in a sense that because we are cross cutting in nature we tend to be interfering in a whole lot of activities which other sectors may find that they*

should actually be leading on and with the work that I coordinate I have that quite often. So I think it's just a matter of providing necessarily clarity you know to demystify those kind of misconceptions.

Participant 14 (SLO) indicated that a key focus for their organisation was to achieve a just transition:

> *…a just transition is, in terms of moving away from fossil fuels towards cleaner greener energy whist taking into consideration socio-economic conditions, economic growth as well as the state of the country so it being a developing country and factoring government objectives in this whole mix whilst trying to transition to cleaner, greener sources of energy…. But, sorry, with the disclaimer that we don't really know whether it will actually be 'just' and there will obviously be winners and losers in this transition. It's about managing those so that there, and not everybody is going to be successful or come out winning or come out on top, but to manage the expectations of those who will not be in the same position that they were previously in the transition*.

Participant 20 (SLO) highlighted the critical need for countries and their governments to have political stability in order to attract investments for its renewable energy.

> *I think the second issue which is one that impacts on us in South Africa but at least it's likely to impact on many other countries is political stability and geopolitics, so when I talk about political stability you know we depend on government being stable because we work with government especially and if government is stable hopefully the rest of society is stable so that you can undertake,…, so first of all government is able to give policy certainty because that's always a question that the private sector asks for. I mean if they sign renewable energy contracts they want to know that the same, that if government changes the contracts or the policies are not going to change or impacts on their business*.

5.7.2.3. Discussion of key theme findings

Both new entrants and incumbents were found to be subject to and managing stakeholder perceptions. However, incumbents needed to manage stakeholder perceptions to demonstrate that their organisations were in the process of decarbonisation. In contrast, new entrants were engaged in managing stakeholder perceptions to secure trust and credibility for their businesses.

SLOs were also found to manage across stakeholders. These stakeholders had different expectations of SLOs, who unlike power producers, were facilitating the renewable energy transition. Further aspects of the stakeholder expectations for SLOs are discussed in theme 2 (tensions between differentiation and conformity).

5.7.2.4. Theme conclusion

All sector participants were subject to and impacted by stakeholder perceptions. However, power producers differed from SLOs with respect to the expectations of their stakeholders. New entrants and incumbents had to manage different stakeholder tensions, becoming reputable and moving towards decarbonisation respectively, whilst SLOs had to manage stakeholder expectations around their role in facilitating the renewable energy transition.

5.7.3. Theme 2: Tensions between differentiation and conformity

5.7.2.1. Theme summary

Table 25 provides a summary of the key findings for the theme of tensions between differentiation and conformity.

Table 25: Theme summary – Tensions between differentiation and conformity

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Tensions between differentiation and conformity	●	●	◑
Legend	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

5.7.2.2. Key findings

New entrants

Generally, all new entrants were observed to be managing the tensions between creating credibility for themselves in the industry and competing in a very competitive market, with many suppliers, insufficient customers and narrow margins.

Incumbents

Aside from noting that their organisation had moved towards self-sufficiency by using renewable energy resources for energy consumption, participant 9 (PP-INC) indicated that simplification was used as a mechanism to navigate multiple demands. Participant 9 (PP-INC) noted: “We are currently in another big workforce transition where we try to simplify and restructure again. We're also under cost pressure, so we de-layer and try to stay more focussed”.

SLOs

Participant 6 (SLO) also noted a competitive tension related to pricing:

> *Ensuring that I do not under-price the product but at the same time do not lose the deal to the competitor and making sure that I show sufficient value in my system that he knows that the person buys he is paying a little bit more but he understands why he is getting a little bit more*.

In response to their competing stakeholder pressures across the various programmes undertaken at Organisation 12, participant 12 (SLO) noted:

> *So there are times where we have to like, for example, shut off on certain programmes and dedicate time specifically to a particular programme so that the particular partner is also getting the attention that he you know that organisation or external partner is deserving of and I think based on that we've also been able to inform the space with a lot of respect for the work that we undertake, the proactive approach that we also apply when we are undertaking the initiatives with a partner and keeping the partners informed, being able to address challenges upfront without ensuring that it's accumulating to a point where all communication breaks down*.

Participant 13 (SLO) cited the multiple demands faced and the need for prioritisation as a mechanism to assist:

> *We also are cognisant that we constantly need to prioritise the shifting priorities that are very responsive to shifting operational or operating contexts so it's a constant dance of dialogue and prioritisation and this prioritisation and the fluidity thereof is quite important.*

Participant 19 (SLO) described the challenges created for their organisation from the tensions between the social and environmental aspects of the renewable energy

transition:

> *The biggest factor would be the fact that the whole South African Economy, or a big part of thereof is driven by coal production. And that's how our electricity system works, and a lot of jobs in a lot of sectors are linked to this coal production and our electricity production. So I guess the challenge there would be then to, if you want to replace it or move towards Renewable Energy then you need to manage Social Impact versus the lesser; the lower carbon footprint that one wants to have, I guess that for me would be the biggest external factor, or stumbling block is the tension between social obligation versus the focus to move to lower carbon footprint, i.e. introducing Renewable Energy, or Alternative Energy sources.*

Participant 19 (SLO) further expanded around the mechanisms that Organisation 10 leverages to navigate its multiple demands:

> *… it's a challenge, we do have resource constraints, we do have a lot of priorities that is conflicting etcetera, so by, I guess by putting dedicated resources to something like that, to drive it, to influence where influence is needed, to put the necessary guidance and requirements in place that is needed and that is properly managed through project management*.

5.7.2.3. Discussion of key theme findings

New entrant power producers were noted to be managing across establishing credibility in the industry and the pursuit of differentiation. In terms of managing and trying to build credibility, they were seen to link with other established industry players. With respect to achieving differentiation, they leveraged and orchestrated resources across organisational and geographic boundaries.

Incumbent power producers were significantly affected by the tensions between differentiation and conformity, as they needed to satisfy stakeholder pressure to lower their carbon footprint and increase operational efficiencies due to the cost and stakeholder pressures.

SLOs were found to establish processes and competencies towards managing stakeholders but had less pressure regarding differentiation. However, the requirement for highly skilled resources was still prevalent as strategic objectives had to be delivered in order to meet stakeholder expectations.

5.7.2.4. Theme conclusion

All sector participants were found to be managing the tensions between differentiation and conformity. Furthermore, there were specific orchestrating mechanisms used to satisfy these tensions.

5.7.4. Category conclusion

All sector participants demonstrated management of orchestrating mechanisms of and across stakeholder perceptions and the tensions between differentiation and conformity through the use of orchestrating mechanisms. The impact of these factors, the management and the type of orchestrating mechanism leveraged differed primarily between power producers and SLOs.

Table 26 provides a summary of the key findings for optimal distinctiveness and also indicates the themes that are discussed in Chapter 6.

Table 26: Summary of optimal distinctiveness

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Optimal distinctiveness	Stakeholder perceptions	●	●	◑
	Tensions between differentiation and conformity	●	●	◑
Legend	Theme/s to be discussed in Chapter 6	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

5.8. Chapter conclusion

Chapter 5 has provided the research findings across the various concepts/theoretical categories and themes identified in Chapter 2. A comparative analysis has been conducted across the research findings and presented against the categories and themes and sector participants.

A key finding is that power producers were observed to be similar in more instances than SLOs with respect to the analysis against the various categories and themes. However, in all instances, sector participants demonstrated an impact from contextual factors, demonstrated the use of dynamic capabilities and the use of orchestrating mechanism

in their organisations, towards the management of stakeholder perceptions and satisfying the tensions between differentiation and conformity.

Table 27 presents a summary of Chapter 5 and indicates the themes discussed in Chapter 6.

Table 27: Chapter 5 conclusions

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Context	Institutional factors	●	●	◑
	Market factors	●	●	◑
Dynamic capabilities	Sensing	●	●	●
	Seizing	◑	◑	●
	Transforming	●	●	◑
Orchestrating mechanisms	Ability to combine selected resources	●	●	●
Optimal distinctiveness	Stakeholder perceptions	●	●	◑
	Tensions between differentiation and conformity	●	●	◑
Legend		○	◑	●
	Theme/s to be discussed in Chapter 6	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

CHAPTER 6: DISCUSSION OF THE RESULTS/FINDINGS AND RESEARCH OUTCOMES

6.1. Introduction

This chapter discusses the research findings identified in Chapter 5. A comparative analysis was conducted between the theoretical categories and themes highlighted in Table 27 and the literature from Chapter 2. A set of research outcomes is produced against each theme and theoretical category.

Figure 8 presents the structure that is followed for the remaining sections of Chapter 6. Each theme was analysed and discussed within a theoretical category. The process was iteratively progressed until all themes within a given theoretical category, and all theoretical categories were completed.

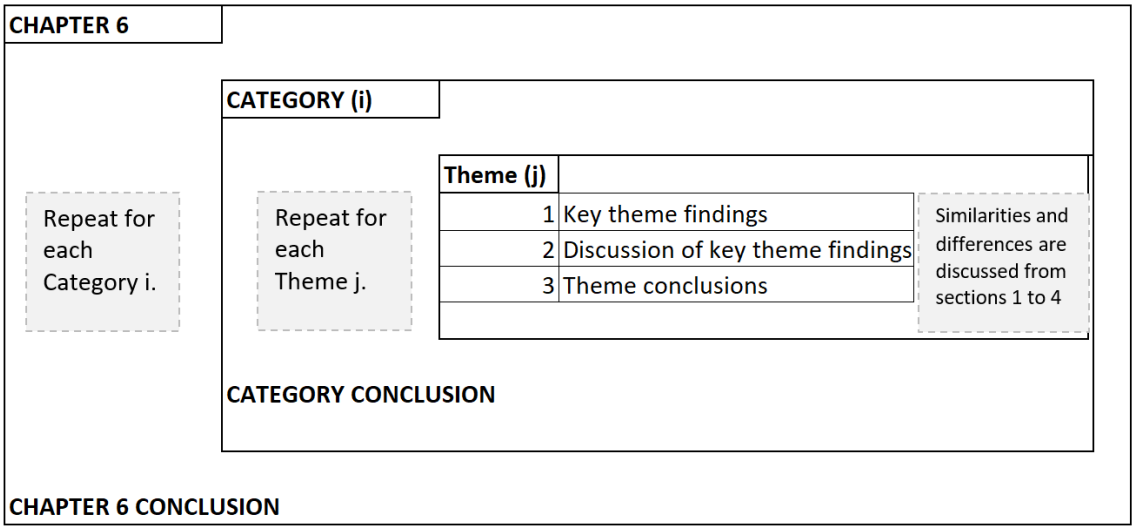


Figure 8: Chapter 6 structure

Source: Author's own compilation

6.2. Discussion of findings for concept/theoretical category 1: Contextual factors

6.2.1. Theme 1: Institutional factors

6.2.1.1. Key theme findings

Table 28 provides a theme summary from Chapter 5 for institutional factors.

Table 28: Theme summary from the research findings-institutional factors

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Institutional factors	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

The key theme across participants related to the renewable energy transition regime change for the. This regime change was observed globally through international pressures, nationally in South Africa through its government's commitment and the REIPPPP, which served as an implementation mechanism in South Africa.

Both new entrants and incumbents were significantly affected by the institutional environment.

However, whilst new entrants generally found the institutional environment supportive of their operations, they faced pressure from international conglomerates with successful track records.

On the other hand, incumbents faced significant institutional and stakeholder pressures to decarbonise their operations. These incumbents had engaged in decarbonisation programmes in their organisations in order to satisfy their stakeholder demands. It was also observed that the fossil fuel industry still maintained political support in the institutional landscape.

SLOs also faced institutional pressures, although this differed from the type of pressure faced by new entrants and incumbents and related more to their sectoral level roles and relevance in facilitating the renewable energy transition.

6.2.1.2. Discussion of key theme findings

Several similarities were found between the research findings and the extant literature. The resistance to change observed from the fossil fuel industry towards the renewable energy transition, together with its political support, is consistent with Vakulchuk et al.

(2020). Similarly, the fossil fuel regime in South Africa was seen as a source of “inertia”, and presented an obstacle to the renewable energy transition; this finding was consistent with Ting and Byrne (2020).

A subtle difference was also found against the extant literature; Andrews-Speed (2016) indicated that obstacles might be found across specific spheres for regime changes. The research findings indicated that new entrants found enabling factors (as opposed to obstacles) in the legislative environment and economy within the regime change context. These enabling factors specifically related to the legitimacy of renewable energy businesses and the ability to acquire funding, due to institutional finance holding direct mandates for investment into the renewable energy sector. However, the research findings and the extant literature were similar for incumbents, as they faced obstacles within the regime change.

The research findings, related to the pressure that new entrants faced from international participants, were similar to the McKnight & Zietsma (2018).

Furthermore, the extant literature does not explicate institutional pressures faced by SLOs (who in many instances held institutional roles themselves) and how this may enable or constrain the renewable energy transition in South Africa.

Levels of institutionalism

All the research findings relate to institutionalism and are generally consistent and fit with the levels of institutionalism presented in Table 4 Andrews-Speed (2016), with a concentration across embedded institutions, the institutional environment and the institutions which govern transactions.

Legitimacy seeking by incumbents under institutional change

Participant 9 (PP-NE) noted that their organisation was in the process of modifying its energy consumption towards renewable energy and integrated this signal into its long-term sustainability targets communicated to the market. This research finding is consistent with the literature Patala et al. (2019) on rhetoric institutionalism and ambidextrous strategic responses. In particular, decarbonisation was an attempt by Organisation 9 to seek legitimacy under the institutional change Patala et al. (2019).

6.2.1.3. Theme conclusions

The research findings are generally consistent with the extant literature, which provides a strong theoretical foundation to understand the institutional characteristics observed

across the energy sector and those that may enable or constrain the renewable energy transition in South Africa. However, there was insufficient literature that addressed the institutional factors that SLOs faced.

6.2.2. Theme 2: Market factors

6.2.2.1. Key theme findings

Table 29 provides a theme summary from Chapter 5 for economic/market factors.

Table 29: Theme summary from the research findings- economic/market factors

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Economic/market factors	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

All sector participants were affected by market factors, although to varying degrees. Economic and regulatory/legislative factors heavily impacted new entrants and incumbents. New entrants were observed to face pressures around establishing trust and credibility within the industry. Conversely, SLOs were the least impacted by economic forces but faced environmental and social pressures due to their sectoral level relevance and facilitation of the renewable energy transition.

6.2.2.2. Discussion of key theme findings

Much of the economic and market factors observed in the research are similar to the extant literature and may be characterised as competitive anchors (Zhao et al., 2017) that market participants must navigate. Zhao et al. (2017) suggested that industry development does not necessarily follow along a linear path and may experience institutional changes due to market shocks. The result is that legitimacy expectations remain in a state of fluidity while competitive anchors change.

The research finding on new entrant pressures to establish credibility and trust in the

industry is consistent with Sirmon et al. (2011). However, there was insufficient literature that addressed the economic/market factors that SLOs faced.

6.2.2.3. Theme conclusions

All of the economic/market factors observed in the research findings may be characterised as competitive anchors for incumbents and new entrants and may contribute to institutional changes when shocked (Zhao et al., 2017). The research findings are generally similar to the extant literature.

6.2.3. Category conclusion

The research findings across institutional and market factors are generally consistent with the literature.

6.3. Discussion of findings for concept/theoretical category 2: Dynamic capabilities

6.3.1. Theme 1: Sensing

6.3.1.1 Key theme findings

Table 30 provides a theme summary from Chapter 5 for sensing.

Table 30: Theme summary from the research findings-sensing

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Sensing	●	●	●
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

In general, all sector participants demonstrated significant sensing processes to varying degrees and purposes.

Sensing involves identifying developments and then making sense of the opportunities (Baden-Fuller & Teece, 2020).

6.3.1.2. Discussion of key theme findings

The research findings were similar to the extant literature Baden-Fuller & Teece (2020). New entrants particularly leveraged sensing processes to identify and make sense of regulatory developments that enabled deeper market penetration (such as the new bid windows of the REIPPPP and changes to regulations that allowed large corporates or municipalities to procure energy from IPPs directly). Incumbents also demonstrated sensing processes to identify developments and make sense of the opportunities and threats, particularly with respect to the pressure to decarbonise their operations. SLOs were also found to maintain sensing processes. All participants generally demonstrated managerial cognitive sensing capabilities in line with Helfat & Peteraf (2015). Participant 15 (PP-NE), in particular, demonstrated differentiated dynamic managerial capabilities which was evident through the identification of an opportunity (which other market participants missed) in the commercial-industrial space.

No specific differences were found between the research findings and the extant literature; however, the research findings could not differentiate how differences in managers' cognitive capabilities affected their ability to sense new opportunities and threats accurately (Helfat & Martin, 2015).

6.3.1.3. Theme conclusions

The research findings and the extant literature are consistent.

6.3.2. Theme 2: Seizing

6.3.2.1. Key theme findings

Table 31 provides a theme summary from Chapter 5 for seizing.

Table 31: Theme summary from the research findings-seizing

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Seizing	◑	◑	●
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

According to Baden-Fuller and Teece (2020), seizing moves into execution and involves mobilising resources and strategic or alliance partners to commit resources to exploit the possibilities identified from the sensing stage. Furthermore, seizing new opportunities involves devising and refining business models (Teece, 2018a).

The research findings revealed that both new entrants and incumbents were shown to mobilise resources and also devise or refine business models, as observed with participant 9 (PP-INC), in response to outcomes from the sensing stage.

New entrants were found to seize resources to exploit opportunities from the sensing stage towards achieving a competitive advantage, as observed with participant 15 (PP-NE) once the commercial industry space opportunity was identified.

Incumbents were found to mobilise resources towards decarbonisation and driving efficiencies. Independent power producers were enabled by legislation to supply power directly to incumbent power producers, large corporates (as per participant 9 (PP-INC)), and municipalities (as per participant 17 (PP-NE)). One incumbent was found to be in the process of undergoing a business model change Teece (2018a) and unbundling its end-to-end business, with the result that independent power producers could supply power directly to its transmission business.

The research findings also indicated that SLOs mobilised resources and strategic alliance partners, typically across organisational boundaries and geographical locations, which resulted in complementary skillset configurations. Moreover, seizing was conducted to a greater extent than that observed for new entrants and incumbents, due to the SLOs' wider networks and access to resources.

6.3.2.2. Discussion of key theme findings

The research findings and extant literature (Baden-Fuller & Teece, 2020; Teece, 2018a) are generally similar. SLOs were found to engage with complementary firms (Teece, 2018a) and leveraged the resulting complementary skillset configurations. In particular, SLOs typically demonstrated a healthy balance in the trade-off between resource commitment and preservation of flexibility Lampert et al. (2020) as the resource mobilisation and commitment related to specific objectives and not long term agreements.

However, nuanced differences exist when comparing power producers with SLOs and the specific mobilisation of resources and strategic alliance partners. The literature did not discuss how the mobilisation occurred for these SLOs.

With respect to the integration of IPPs to supply electricity to incumbents, large corporates and municipalities, the research findings did not reveal any form of integration seizing Vanpoucke et al. (2014) was in place.

6.3.2.3. Theme conclusions

The research findings and the extant literature are generally consistent. However, there was insufficient evidence in the research findings related to how IPPs and incumbents, large corporates and municipalities will achieve supplier integration Vanpoucke et al. (2014).

6.3.3. Theme 3: Transforming

6.3.3.1. Key theme findings

Table 32 provides a theme summary from Chapter 5 for transforming.

Table 32: Theme summary from the research findings-transforming

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Transforming	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

Both new entrants and incumbents were found to have significant transformation programmes in their respective organisations.

New entrants sought to transform their organisations to move across the renewable energy value chain or scale up to meet client demands. Participant 2 (PP-NE) noted their organisational shift from project management to an independent power producer, whilst participant 17 (PP-NE) indicated that their organisation had to scale up their operations to meet the huge demand pipeline.

All incumbents were observed to transform their organisation to incorporate the use of renewable energy into their operations, citing this as a self-sufficiency model for energy consumption. One incumbent had also transformed their organisation to drive efficiencies.

SLOs were found to transform by employing orchestrating mechanisms when partnering across organisational boundaries and geographical locations. Participant 6 (SLO) started a solar energy consultancy by identifying and constructing a business model that leveraged a core competence in finance and outsourcing arrangements for the design and engineering processes (which also included supply chain input for the solar products). Furthermore, participant 4 (SLO) articulated that the exploration of a particular technology within their organisation had expanded to a point where it could not be funded, and subsequently led to the generation of an isolated company to progress it.

Teece (2018a) stated that transformation involves realigning structure and culture, aligning existing capabilities, and investing in additional capabilities. Baden-Fuller and Teece (2020) indicated that assembling and orchestration of resources could come from inside the firm and partners. Teece (2018a) stated that a firm's resources must be orchestrated and coordinated with partner firms' activities to deliver value to customers. A firm's management must also decide which of its activities must be conducted by complementary firms or outsourcing providers. Transformation should also be conducted repeatedly (Teece, 2018a).

6.3.3.2. Discussion of key theme findings

The research findings are generally consistent with the extant literature (Baden-Fuller & Teece (2020); Teece (2018a)). In particular, participant 2 (PP-NE) and participant 17 (PP-NE) had transformed structures and invested in new capabilities within their respective organisations. This research finding is similar to (Teece, 2018a).

The business model created by participant 6 (SLO) leveraged the core competencies of outsourcing partners in design and engineering. This research finding is similar to Sen et al. (2020).

There was insufficient data about cultural realignment from the research; therefore, no analysis could be conducted on this aspect related to the literature.

6.3.3.3. Theme conclusions

The research findings and the extant literature (Baden-Fuller & Teece (2020); Sen et al. (2020); Teece (2018a)) are generally consistent.

6.3.4. Category conclusion

The research findings and the extant literature are generally consistent and demonstrated the use of dynamic capabilities across new entrants, incumbents and

SLOs.

6.4. Discussion of findings for concept/theoretical category 3: Orchestrating mechanisms

6.4.1. Theme 1: Ability to combine selected resources

6.4.1.1. Key theme findings.

Table 33 provides a theme summary from Chapter 5 for the ability to combined selected resources.

Table 33: Theme summary from the research findings-Ability to combine selected resources

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Ability to combine selected resources	●	●	●
Legend	○ Not affected	◑ Moderately affected	● Significantly affected

Source: Author's own compilation

"Asset orchestration is defined as the ability to combine selected technologies, individuals and other resources in new products and processes regardless of location and across organisational boundaries" (Lessard et al., 2016, p.4).

The research findings revealed that both new entrants and incumbents leveraged resource orchestration. New entrants were found to use asset orchestration to expand their operations and achieve a competitive advantage. Incumbents were found to use asset orchestration to assist their efforts towards decarbonisation, lowering costs and drive optimisation. One incumbent was found to be experimenting with a centralised and decentralised model to achieve efficiencies in their operations.

6.4.1.2. Discussion of key theme findings

All of the research findings are similar to the extant literature. There were multiple observations of combinations of selected technologies, individuals and other resources (Hughes et al., 2018; Lessard et al., 2016) in new products and processes across organisational boundaries and geographical locations.

However, there appears to be a difference between the findings and the extant literature between new entrants and incumbents in that incumbents were found to leverage resource orchestration to decarbonise their operations whilst the final product to the consumer remained the same. Furthermore, SLOs were found to have the strongest ability to leverage resources orchestration across organisational boundaries and geographical locations. There also appears to be a nuance of a difference between these sector participants related to their abilities to orchestrate resources and also with respect to the availability of resources to be orchestrated.

The research findings related to one incumbent's consideration towards the use of a centralised or decentralised model was similar to the exploitation process suggested by Sirmon et al. (2011).

The research findings also revealed that SLOs leveraged resource orchestration, particularly across organisational boundaries and geographical locations. In particular, SLOs were found to have complementary alliances; however, these alliances were not put in place to achieve a competitive advantage, and thus, this differs from the literature (Sirmon et al., 2011).

6.4.1.3. Theme conclusions

The research findings and the extant literature are similar. Differences were found between the research findings and the extant literature with respect to the specific abilities between sector participants and the reasons for the differences in the abilities. SLOs demonstrated significant capability to orchestrate resources across and outside of organisational boundaries and geographical locations; however, this was not within a competitive context outlined by Sirmon et al. (2011).

6.4.2. Category conclusion

The research findings and the extant literature have nuanced differences related to the specific abilities of sector participants to combine selected resources.

6.5. Discussion of findings for concept/theoretical category 4: Optimal distinctiveness

6.5.1. Theme 1: Stakeholder perceptions

6.5.1.1. Key theme findings

Table 34 provides a theme summary from Chapter 5 for stakeholder perceptions.

Table 34: Theme summary from the research findings-Stakeholder perceptions

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Stakeholder perceptions	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

The research findings indicated that both new entrants and incumbents were found to be subject to and managing stakeholder perceptions. However, incumbents were engaged in managing stakeholder perceptions to demonstrate that their organisations were in the process of decarbonisation. In contrast, new entrants were engaged in managing stakeholder perceptions to secure trust and credibility for their businesses. New entrants were also found to provide additional services to retain customers, given the small size of the market.

The research findings also indicated that SLOs were also found to manage across various stakeholders. These stakeholders had different expectations of SLOs, which, unlike power producers, were facilitating the renewable energy transition at a sectoral level.

6.5.1.2. Discussion of key theme findings

New entrants

The research findings revealed that new entrants sought credibility gains in the industry, which is consistent with the extant literature (Baden-Fuller & Teece, 2019; Sirmon et al., 2011). Some of the mechanisms used by new entrants were to communicate, work together and deliver additional services to customers.

Incumbents

The research findings and the literature are similar in that incumbents were found to use and manage a portfolio of orchestrating mechanisms Zhao et al. (2017) to satisfy stakeholder perceptions and gain legitimacy Patala et al. (2019) related to their organisational decarbonisation efforts.

SLOs

The research findings indicated that SLOs managed a portfolio of orchestrating mechanisms with respect to their management of stakeholder perceptions. In particular, SLOs mapped stakeholders' needs and evaluated stakeholder health, engaged in partnerships, and leveraged clear communication in managing stakeholder perceptions. However, the use of these orchestrating mechanisms by SLOs to manage stakeholder perceptions was not sufficiently clear in the literature.

6.5.1.3. Theme conclusions

The research findings and the extant literature are similar for new entrants and incumbents concerning their management of stakeholder perceptions. However, there was insufficient clarity concerning SLOs and their management of stakeholder perceptions in the literature.

6.5.2. Theme 2: Tensions between differentiation and conformity

6.5.2.1. Key theme findings

Table 35 provides a theme summary from Chapter 5 for tensions between differentiation and conformity.

Table 35: Theme summary from the research findings-tensions between differentiation and conformity

Theme	Sector category		
	Power producers		SLO
	New entrant	Incumbents	
Tensions between differentiation and conformity	●	●	◑
Legend	○	◑	●
	Not affected	Moderately affected	Significantly affected

Source: Author's own compilation

Generally, the research findings indicated that all new entrants managed the tensions between creating credibility for themselves in the industry and participating in a very competitive market, with many suppliers, insufficient customers and narrow margins. However, it was observed that new entrants demonstrated differing complementary resources and capabilities, which they were able to leverage.

Similarly, the research findings indicated that incumbents primarily had initiatives towards decarbonising their operations and sought optimisation to drive efficiencies, given cost pressures and the need to satisfy customers.

The research findings indicated that SLOs were primarily managing stakeholder perceptions related to their role in facilitating the renewable energy transition and also the tensions between the economic, social and environmental impacts of the renewable energy transition.

As discussed in Chapter 2, the achievement of optimal distinctiveness is a function of a firm's ability to manage a portfolio of various orchestrating mechanisms, and integrate it into the firm's practices, and the identification of critical stakeholders, whose perceptions that the tension between differentiation and conformity should be reconciled (Zhao et al., 2017).

6.5.2.2. Discussion of key theme findings

New entrants with access to complementary resources and capability were found to leverage integrative orchestration with a resulting synergistic system-level combination that produced a differentiated product (Zhao et al., 2017). In particular, this was observed with participant 15 (PP-NE), whose organisation leveraged cross technological and technical resources and capability (Chattopadhyay & Bercovitz, 2020; Moeen, 2017) situated within the broader conglomerate that the renewable energy business resided. This research finding is also consistent with McKnight & Zietsma (2018), as it demonstrates technological radicalness and leveraging a firm's presence in international markets (conditions 3 and 6 in Table 2) towards attaining legitimacy and achieving differentiation and that conformity and differentiation don't necessarily always exhibit an inverse relationship. In general, other competitive anchors may also be leveraged towards integrative orchestration (Zhao et al., 2017). These new entrants will be referred to as new entrants (diversified).

On the other hand, new entrants that could not access additional technical capability, such as participant 2 (PP-NE), leveraged complementary orchestration to achieve differentiation, even with potentially undifferentiated products (Zhao et al., 2017). In particular, participant 2 (PP-NE) was found to deliver additional customer service to retain customers. This research finding is consistent with (Patala et al., 2019; Zhao et al., 2017) and reinforces how new entrants undertake legitimacy gaining strategies (McKnight & Zietsma, 2018; Sirmon et al., 2011). These new entrants will be referred to as new entrants (pure-play).

Participant 6 (SLO) leveraged integrative orchestration Zhao et al. (2017) by combining and configuring capabilities (design and engineering) residing outside of Organisation 6 through outsourcing arrangements Sen et al. (2020). Furthermore, participant 6 (SLO) also leveraged prior relevant finance experience to set up the lead generation component of Organisation 6. This research finding was consistent with condition 5 in Table 2 McKnight & Zietsma (2018).

Participant 6 (SLO) further highlighted that certain new entrants leveraged a mechanism called performance guarantees, by bearing the cost of additional installations to compensate when the original installation generated below the promised capacity. This form of compensatory orchestration allowed for the longevity of these new entrants business. This research finding is consistent with Zhao et al. (2017).

In general, other competitive anchors may also be leveraged towards compensatory orchestration Zhao et al. (2017).

Optimal distinctiveness positioning

Given that new entrants had already obtained a primary form of legitimacy, as their base operations were already decarbonised, which may be considered as threshold orchestration McKnight & Zietsma (2018), the attainment of differentiation is used to achieve credibility and legitimacy in an industry with many suppliers and a thin customer base, as a trusted industry name, and competitiveness.

On the other hand, incumbents were found to leverage compensatory orchestration Zhao et al. (2017). In particular, given their organisations are, by design, fossil fuel-based consumers and producers, they leveraged compensatory orchestration to introduce renewable energy consumption into their operations to satisfy stakeholder perceptions related to decarbonisation. In general, given the deficiency in one or more components of their operation, SLOs demonstrated conformity in other components by leveraging compensatory orchestration (Zhao et al., 2017). This finding is also consistent with Patala et al. (2019).

SLOs were primarily found to leverage funding pools and their networks to enhance technical competency (Chattopadhyay & Bercovitz, 2020; Moeen, 2017) towards completing sectoral level objectives. SLOs were observed to combine resources across and outside organisational boundaries and geographical locations with the resulting synergistic system-level combination representing a unique capability. This may be considered as integrative orchestration Zhao et al. (2017) used toward satisfying

stakeholder perceptions around SLOs being able to facilitate the renewable energy transition. This research finding related to SLOs and the use of integrative orchestration was not present in the literature.

6.5.2.3. Theme conclusions

Table 36 presents a summary of the theme conclusions.

Table 36: Orchestrating mechanisms used to achieve optimal distinctiveness

Orchestrating mechanisms to achieve optimal distinctiveness	Power producers			SLOs
	New entrants		Incumbents	
	Diversified	Pure-play		
Integrative orchestration	●	■	■	●
Compensatory orchestration	■	●	●	■
Legend	● Orchestration type leveraged			

Source: Author's own compilation

New entrants were found to differ in their orchestrating mechanisms to achieve optimal distinctiveness. New entrants (diversified) were found to leverage integrative orchestration towards achieving optimal distinctiveness, whilst new entrants (pure-play) leveraged compensatory orchestration towards achieving optimal distinctiveness.

Incumbents leveraged compensatory orchestration towards satisfying stakeholder perceptions, which is consistent with the literature Patala et al. (2019). On the other hand, SLOs leveraged integrative orchestration to improve technical efficiency and satisfy stakeholder perceptions; this finding was not present in the literature.

Compared with Figure 3 in Chapter 2**,** the research outcomes suggest the following optimal distinctiveness positioning illustrated in Figure 9. New entrants (diversified), new entrants (pure-play) and incumbents demonstrated high differentiation and low legitimacy, low differentiation and low legitimacy and low differentiation and high legitimacy respectively.

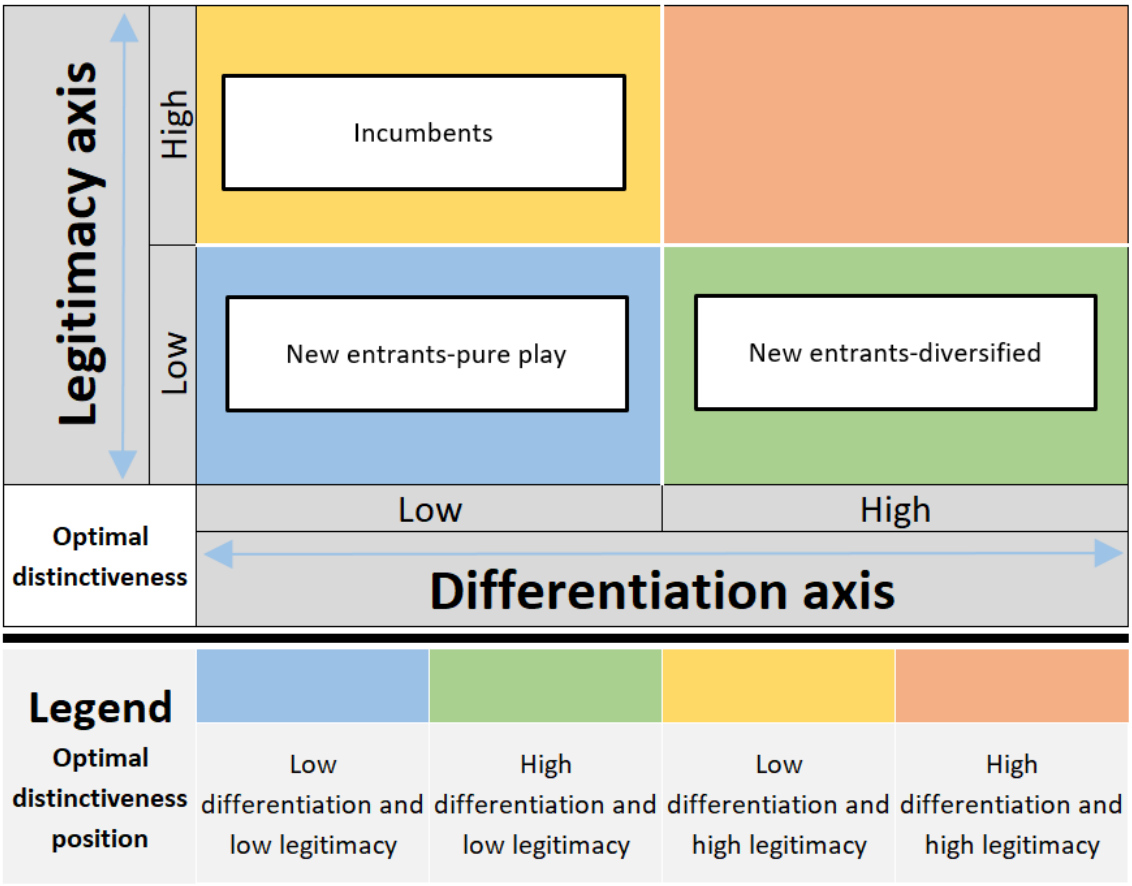


Figure 9: Optimal distinctiveness positions for incumbents, new entrants (pure-play) and new entrants (diversified)

Source: Author's own compilation

6.5.3. Category conclusion

New entrants were found to differ in their orchestrating mechanisms to achieve optimal distinctiveness. New entrants (diversified) leveraged integrative orchestration towards achieving optimal distinctiveness whilst new entrants (pure-play) leveraged compensatory orchestration towards achieving optimal distinctiveness. This researching finding was different from the literature.

Incumbents leveraged compensatory orchestration towards satisfying stakeholder perceptions, which is consistent with the literature. On the other hand, SLOs leveraged integrative orchestration to improve technical efficiency and satisfy stakeholder perceptions; this finding was not present in the literature.

The research outcomes suggested the optimal distinctiveness positioning in Figure 9 for new entrants and incumbents. New entrants (diversified), new entrants (pure-play) and incumbents demonstrated high differentiation and low legitimacy, low differentiation and

low legitimacy and low differentiation and high legitimacy respectively.

6.6. Chapter conclusion

The research findings and the literature are similar for both new entrants and incumbents in terms of managing stakeholder perceptions. However, there was insufficient clarity for SLOs and their management of stakeholder perceptions in the literature.

New entrants (diversified) and new entrants (pure-play) were found to leverage integrative and compensatory orchestration, respectively. These research outcomes were not evident in the literature. Similarly, the research outcome on SLOs' use of integrative orchestration is not evident in the literature. The research outcome on incumbents' use of compensatory orchestration is similar to the literature.

In general, it was found that SLOs remain largely understudied within the renewable energy sector with respect to optimal distinctiveness.

6.6.1. Conceptual framework

The conceptual framework presented in Figure 5 of Chapter 2 has been modified, based on the research outcomes discussed in Chapter 6. This modification is illustrated in Figure 10 as the revised conceptual framework. In particular, the revised conceptual framework takes into account that new entrants (diversified) leverage integrative orchestration and new entrants (pure-play) and incumbents leverage compensatory orchestration to achieve optimal distinctiveness.

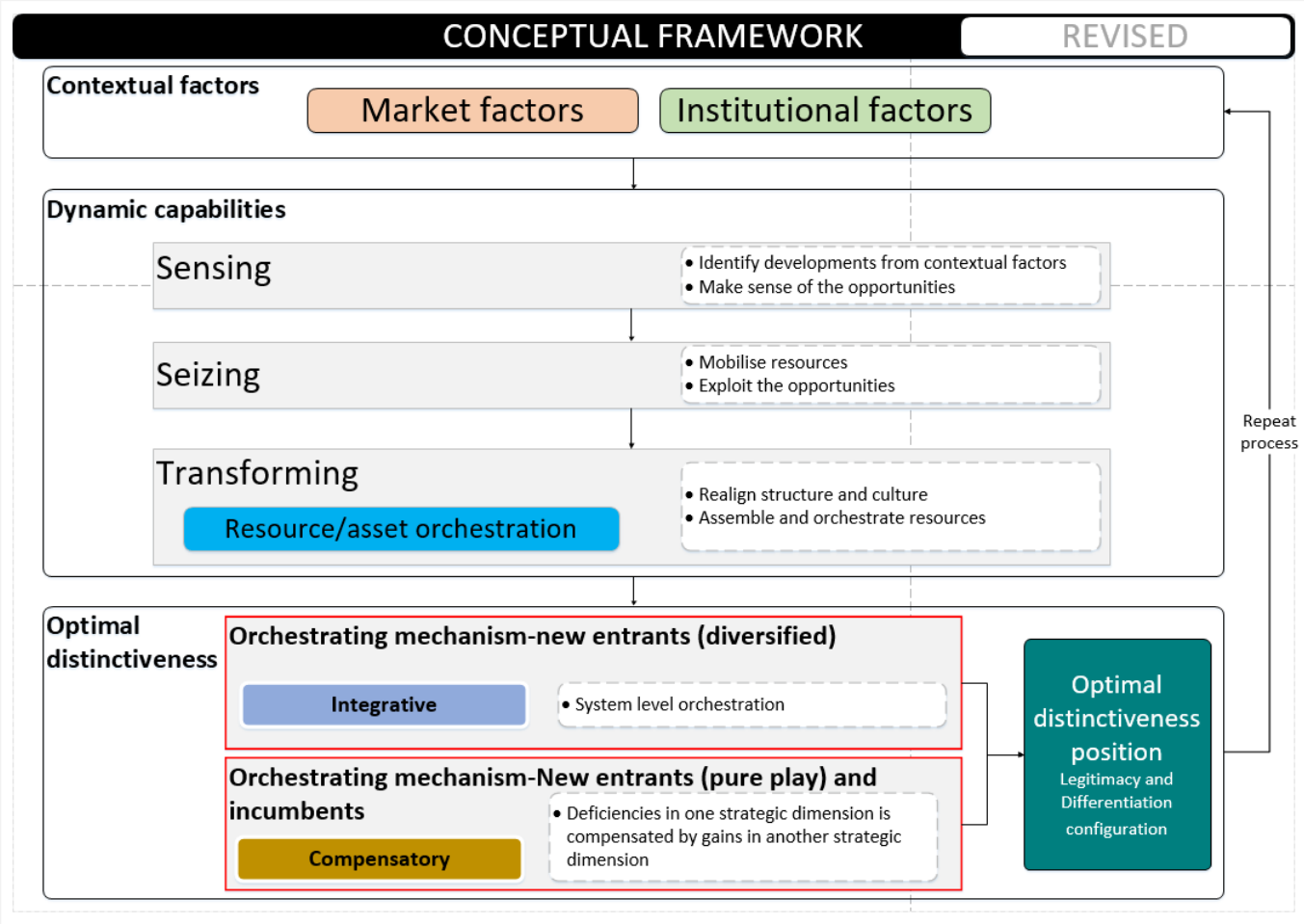


Figure 10: Revised conceptual framework

Source: Author's own compilation

CHAPTER 7: CONCLUSION

7.1 Conclusion

The revised conceptual framework and summary of the research outcomes from Chapter 6 are presented in Figure 11 and Table 37.

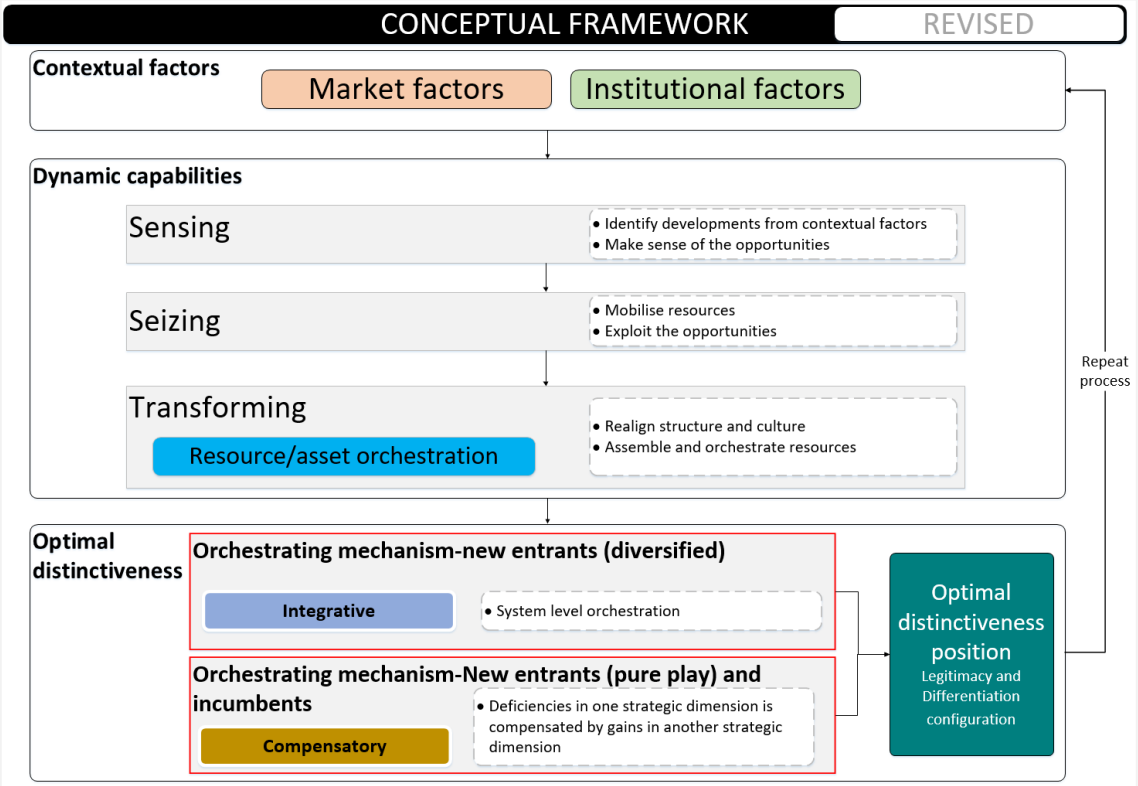


Figure 11: Revised conceptual framework

Source: Author's own compilation

Table 37: Research outcomes

Concept/ Theoretical Category	Theme	Sector category		
		Power producers		SLO
		New entrant	Incumbents	
Context	Institutional factors	○	○	○
	Market factors	○	○	○
Dynamic capabilities	Sensing	○	○	○
	Seizing	◑	◑	○
	Transforming	○	○	○
Resource orchestration	Ability to combine selected resources	◑	◑	◑
Optimal distinctiveness	Stakeholder perceptions	○	○	
	Tensions between differentiation and conformity (*what orchestration mechanism is used to satisfy the tension*)	●	○	
Legend Research outcomes *(comparison between the reseach findings and extant literature)*		○ Similar	◑ Nuanced differences	● Different
	Not applicable			

Source: Author's own compilation

7.1.1. Institutional and market factors

Generally, all institutional and economic/market factors identified in the research findings are similar to the extant literature Zhao et al. (2017). These research outcomes helped understand environmental factors to which the various sectoral participants were exposed to and how they responded, ensure legitimacy and differentiation, and ultimately meet their strategic outcomes.

Incumbents and new entrants were found to be impacted by various institutional factors. However, new entrants sought to gain legitimacy in the industry with respect to their customer base, which was consistent with (McKnight & Zietsma, 2018; Sirmon et al., 2011). On the other hand, incumbents sought to gain legitimacy with respect to their decarbonisation efforts; this was found to be consistent with (Patala et al., 2019). SLOs faced institutional pressures from their stakeholders due to the sectoral relevance of their work. The renewable energy sector was also observed to hold a high amount of suppliers, thin yet growing customer base and exhibited a decreasing cost profile for renewable energy technology.

7.1.2. Dynamic capabilities

The research outcomes and the extant literature (Baden-Fuller & Teece, 2020; Teece, 2018a) on dynamic capabilities were generally consistent.

All sectoral participants demonstrated sensing capabilities and demonstrated awareness of legislative and regulatory changes impacting the energy industry.

Furthermore, all sectoral participants demonstrated seizing capabilities; however, these differed in terms of resource access. New entrants and incumbents were typically limited to their organisational boundaries, and geographical locations whilst SLOs demonstrated the broadest access to resources.

Many participants demonstrated strong dynamic managerial capabilities (Helfat & Martin, 2015; Helfat & Peteraf, 2015). The research findings and outcomes demonstrated some link to differentiated operations; however, the study was not explicitly designed to measure dynamic managerial capabilities across research participants.

7.1.3. Resource orchestration

The research findings and the extant literature (Lessard et al., 2016; Pitelis & Teece, 2018; Sirmon et al., 2011) have nuanced differences related to sector participants' specific abilities to combine selected resources.

New entrants were found to leverage asset orchestration to expand their operations and achieve a competitive advantage. On the other hand, incumbents were found to leverage asset orchestration to assist their decarbonisation efforts, lower costs, and drive optimisation.

7.1.4. Optimal distinctiveness

The research findings and the extant literature (Barlow et al., 2019; McDonald & Eisenhardt, 2020; Zhao et al., 2017) were similar for stakeholder perceptions and different for tensions between differentiation and conformity.

New entrants were found to differ in their orchestrating mechanisms to achieve optimal distinctiveness. New entrants (diversified) were found to leverage integrative orchestration towards achieving optimal distinctiveness. New entrants (pure-play) leveraged compensatory orchestration to satisfy stakeholder perceptions and gain legitimacy in achieving optimal distinctiveness. This research outcome was not consistent with the extant literature.

Incumbents leveraged compensatory orchestration towards satisfying stakeholder perceptions around their decarbonisation efforts, which was consistent with the extant literature (Patala et al., 2019). On the other hand, SLOs leveraged integrative orchestration to improve technical efficiency and satisfy stakeholder perceptions of their ability to facilitate the renewable energy transition; this research outcome was not evident in the literature.

7.1.5. Summary

This study set out to understand how incumbent and new entrant firms in the South African energy sector addressed the competing pressures of differentiation and institutional legitimacy in securing an optimally distinct position within their industry context.

In general, it was found that both incumbents and new entrants leveraged dynamic capabilities, although not uniformly, to sense, seize and transform their organisations to gain legitimacy, secure differentiation and attain optimally distinctive positions.

Institutional and economic/market forces were addressed through the use of dynamic capabilities to sense opportunities and threats from institutional and economic/market environments and more generally, competitive anchors Zhao et al. (2017), and then seize perceived opportunities through the mobilisation of resources and changes to

business models. These resources were orchestrated to transform an organisation's structure in response to the institutional and economic/market forces, by leveraging either integrative or compensatory orchestration mechanisms to satisfy the tensions between legitimacy and differentiation. Incumbents in the South African energy sector, were found to leverage compensatory orchestration to demonstrate organisational decarbonisation efforts to their stakeholders. On the other hand, new entrants were found to leverage either integrative or compensatory orchestration to achieve optimal distinctiveness. New entrants (diversified) with substantial technical efficiency/competence and resource access leveraged a more comprehensive set of resources through integrative orchestration to achieve system-level differentiation and legitimacy. On the other hand, new entrants (pure-play), without such technical competence and resource access, leveraged compensatory orchestration techniques to achieve differentiation and legitimacy.

In summary, incumbents and new entrants leveraged their dynamic capabilities to pursue different optimally distinct positions in response to institutional and economic/market forces, with new entrants themselves also demonstrating differences in their optimally distinct positions.

7.2. Research contribution

7.2.1. Introduction

Due to the limited scope of the research and timeframes, the claims made in this section remain tentative.

7.2.2. Contribution to the literature

Generally, all research outcomes and extant literature that were similar represent a contribution to the literature.

7.2.3. Refinement to the literature

Power producers and SLOs demonstrated significantly different capability with respect to the orchestration of resources. Power producers were typically limited to their organisational boundaries and geographical locations for which they had a presence in, whilst SLOs typically had access to resources across organisational boundaries and geographical locations through wider networks and partnerships. This represents a refinement to the literature, due to the nuanced differences found between the research outcomes and the extant literature.

7.2.4. Extension to the literature

New entrants (diversified) with access to complementary resources and capabilities leveraged integrative orchestration whilst new entrants (pure-play) without access to complementary resources and capabilities leveraged compensatory orchestration. These orchestrating mechanisms lead to differentiation (and thus legitimacy) and different optimally distinctive positions for the respective new entrants.

This represents an extension to the literature due to the differences found between the research outcomes and the extant literature.

7.3. Recommendation for managers

Managers at power producers must develop and leverage dynamic capabilities to deliberately seek out at optimally distinctive positions within their industry context. More specifically, managers should embed dynamic capability-based practices within organisational routines and seek to develop their dynamic managerial capabilities. Furthermore, this exercise represents an ongoing initiative that power producers must undertake, particularly given the dynamic nature of the institutional and market environments. As competitive anchors shift and regime changes manifest, power producers must respond in an appropriate and timeous manner with active sensing, seizing and transformation capabilities.

In particular, new entrants (diversified) with access to complementary resources and capabilities must leverage integrative orchestration to create differentiation, towards new or renewed competitive market positions, and gain legitimacy. Organisation 15 illustrated a strong example of leveraging integrative orchestration towards achieving optimal distinctiveness, through the use of its dynamic capabilities to sense and identify an opportunity in the market related to the commercial-industrial space, seized the opportunity through the mobilisation of resources from other business units residing in its holding company, and then configure and transform structures to create a renewable energy power production firm with an extensive geographical footprint.

New entrants (pure-play) without such access to such complementary resources and capabilities must leverage compensatory orchestration to gain legitimacy with respect to stakeholder perceptions.

Managers at incumbent firms must leverage compensatory orchestration strategies to gain legitimacy with respect to stakeholder perceptions around decarbonisation efforts. Similarly, there may be other deficiencies within incumbent organisations, for which they

may leverage compensatory orchestration to assist in attending to stakeholder perceptions. They must identify specific dimensions for which they can compensate and satisfy the differentiation and legitimacy tension adequately. Incumbents may also pursue differentiation as a parallel or secondary objective through either integrative or compensatory orchestration.

Managers at SLOs may leverage dynamic capabilities to sense changes in the environmental factors that impact the enablement and facilitation of the renewable energy transition. These managers may leverage integrative orchestration by widening their networks to remain current with developments and enhancing the ability to mobilise resources and technical expertise.

7.4. Research limitations

The primary limitations related to the research design have been provided at the end of Chapter 4.

This research does not address and analyse all the institutional and market factors and competitive anchors identified through the data collection process. Furthermore, the sample set is not exhaustive. The research has considered a single point in time for the data collection process and therefore, does not provide insight into how optimal distinctiveness positions change through time as institutional and economic/market environment shocks occur. The research also considers an aggregate optimal distinctiveness position and therefore, may lack sufficient granularity and accuracy of the optimally distinctive position assumed.

Finally, the research design is qualitative and may benefit from the explanatory power that a quantitative research design could provide.

7.5. Recommendations for further research

This study has revealed various areas as recommendations for further research. These recommendations are categorised into the following sections.

Institutional factors

- Further research is needed to incorporate an in-depth focus on institutional theory to identify a broader set of institutional factors that incumbents and new entrants must address.

Market factors

- Further research should explore a broader range of economic and market factors to which incumbents and new entrants must address.

Dynamic capabilities

- Explore how differences in organisational and managerial dynamic capabilities (Helfat & Martin, 2015; Stadler et al., 2013) between firms within a specific sector category, such as new entrants, potentially result in differences of optimally distinctive positions, with controls in place for other variables that give rise to firm-level differences
- Further research is needed to explore other sub-categories of dynamic capabilities (such as integration sensing, seizing and transforming Vanpoucke et al. (2014)) to understand their impact from an institutional and market perspective and how these impact optimally distinctive positioning.

Resource orchestration

- Further research is needed into asset/resource complementarity to obtain more in-depth insights into resource commitment and flexibility tensions Lampert et al. (2020).

Optimal distinctiveness

The following areas should be explored with a quantitative or mixed methods research design:

- Explore the conditions under which optimal distinctiveness is managed (noted in Table 2) in more depth and other forms of orchestration mechanisms, such as threshold orchestration McKnight & Zietsma (2018).
- Consider optimally distinctive positions for categories of (or unitary) stakeholders McKnight & Zietsma (2018).

General

- Research design: legitimacy thresholds and tangible optimal distinctiveness positions should be explored through quantitative measurement of institutional, market factors and competitive anchors. This may enable valid plotting of optimally distinctive positions, such as that suggested in Figure 9.
- Obtain a larger sample size of participants for the study
- Consider a longitudinal study to investigate how optimal distinctiveness positions

change when competitive anchor shocks and regime changes occur through time.

- SLOs, including the various conceptualised roles they serve in the renewable energy transition, present a strong call for more research.

REFERENCES

Andrews-Speed, P. (2016). Applying institutional theory to the low-carbon energy transition. *Energy Research & Social Science*, *13*, 216–225.

Baden-Fuller, C., & Teece, D. J. (2019). Market sensing, dynamic capability, and competitive dynamics. *Industrial Marketing Management*.

Baden-Fuller, C., & Teece, D. J. (2020). Market sensing, dynamic capability, and competitive dynamics. *Industrial Marketing Management*, *89*(November 2019), 105–106. https://doi.org/10.1016/j.indmarman.2019.11.008

Barlow, M. A., Verhaal, J. C., & Angus, R. W. (2019). Optimal distinctiveness, strategic categorization, and product market entry on the Google Play app platform. *Strategic Management Journal*, *40*(8), 1219–1242. https://doi.org/10.1002/smj.3019

Bhattacharya, M., Paramati, S. R., Ozturk, I., & Bhattacharya, S. (2016). The effect of renewable energy consumption on economic growth: Evidence from top 38 countries. *Applied Energy*, *162*, 733–741. https://doi.org/10.1016/j.apenergy.2015.10.104

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. Retrieved from http://www.tandfonline.com/action/journalInformation?journalCode=uqrp20%5Cnhttp://www.tandfonline.com/action/journalInformation?journalCode=uqrp20

Chang, S.-J., & Wu, B. (2014). Institutional barriers and industry dynamics. *Strategic Management Journal*, *35*(8), 1103–1123.

Chattopadhyay, S., & Bercovitz, J. (2020). When one door closes , another door opens … for some : Evidence from the post-TRIPS Indian pharmaceutical industry. *Strategic Management Journal*, *41*(6), 988–1022. https://doi.org/10.1002/smj.3140

Crane, A., Henriques, I., Husted, B. W., & Matten, D. (2016). Publishing Country Studies in Business & Society: Or, Do We Care About CSR in Mongolia? *Business and Society*, *55*(1), 3–10. https://doi.org/10.1177/0007650315619507

Creswell, J. D., & Creswell, J. W. (2018). *Research design: Qualititative, Quantitative and Mixed Methods Approaches* (5th ed.). Thousand Oaks, CA: Sage Publications.

Cypress, B. S. (2017). Rigor or reliability and validity in qualitative research: Perspectives, strategies, reconceptualization, and recommendations. *Dimensions of Critical Care Nursing*, *36*(4), 253–263. https://doi.org/10.1097/DCC.0000000000000253

Department of Energy. (2018). *State of Renewable Energy in South Africa - 2017*. Retrieved from http://www.energy.gov.za/files/media/Pub/2017-State-of-Renewable-Energy-in-South-Africa.pdf

Department of Energy. (2019). Integrated Resource Plan 2019. In *Department of Energy*. https://doi.org/http://dx.doi.org/9771682584003-32963

Department of Minerals and Energy. (2003). White Paper on the Renewable Energy Policy of the Republic of South Africa. In *Government Gazette*. https://doi.org/102GOU/B

Eisenhardt, K., Graebner, M., & Sonenshein, S. (2016). Grand challenges and inductive methods: rigor without rigor mortis. *Academy of Management Journal*, *59*(4), 1113–1123. Retrieved from https://web-b-ebscohost-com.proxy.bc.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=5fa3f004-27e0-4668-ad22-c912044baa49%40pdc-v-sessmgr04

Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *Qualitative Report*, *20*(9), 1408–1416.

Haans, R. F. J. (2019). What's the value of being different when everyone is? The effects of distinctiveness on performance in homogeneous versus heterogeneous categories. *Strategic Management Journal*, *40*(1), 3–27. https://doi.org/10.1002/smj.2978

Helfat, C. E., & Martin, J. A. (2015). Dynamic Managerial Capabilities: Review and Assessment of Managerial Impact on Strategic Change. *Journal of Management*, *41*(5), 1281–1312. https://doi.org/10.1177/0149206314561301

Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, *36*, 831–850. https://doi.org/10.1002/smj

Hughes, P., Hodgkinson, I. R., Elliott, K., & Hughes, M. (2018). Strategy, operations, and profitability: the role of resource orchestration. *International Journal of Operations*

and Production Management, *38*(4), 1125–1143. https://doi.org/10.1108/IJOPM-10-2016-0634

International Renewable Energy Agency. (2017). *Renewable Energy Benefits: Understanding the Socio-Economics*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Nov/IRENA_Understanding_Socio_Economics_2017.pdf?la=en&hash=C430B7EF772BA0E631190A75F7243B992211F102

Kucharski, J. B., & Unesaki, H. (2018). An institutional analysis of the Japanese energy transition. *Environmental Innovation and Societal Transitions*, *29*, 126–143. https://doi.org/10.1016/j.eist.2018.07.004

Lampert, C. M., Kim, M., & Polidoro, F. (2020). Branching and Anchoring: Complementary Asset Configurations in Conditions of Knightian Uncertainty. *Academy of Management Review*, *45*(4), 847–868. https://doi.org/10.5465/amr.2018.0238

Leih, S., & Teece, D. (2016). Uncertainty, innovation, and dynamic capabilities: An introduction. *California Management Review*, *58*(4), 5–12. https://doi.org/10.1525/cmr.2016.58.4.5

Lessard, D., Teece, D. J., & Leih, S. (2016). The Dynamic Capabilities of Meta-Multinationals. *Global Strategy Journal*, *6*(3), 211–224. https://doi.org/10.1002/gsj.1126

Madsen, T., & Walker, G. (2017). Competitive heterogeneity, cohorts, and persistent advantage. *Strategic Management J*, *38*(2), 184–202. https://doi.org/10.1002/smj

McDonald, R. M., & Eisenhardt, K. M. (2020). Parallel Play: Startups, Nascent Markets, and Effective Business-model Design. *Administrative Science Quarterly*, *65*(2), 483–523. https://doi.org/10.1177/0001839219852349

McKnight, B., & Zietsma, C. (2018). Finding the threshold: A configurational approach to optimal distinctiveness. *Journal of Business Venturing*, *33*(4), 493–512. https://doi.org/10.1016/j.jbusvent.2018.03.004

Moeen, M. (2017). Entry into Nascent Industries : Disentangling a Firm ' s Capability Portfolio at the Time of Investment Versus. *Strategic Management Journal*, *38*(10), 1986–2004. https://doi.org/10.1002/smj

Patala, S., Korpivaara, I., Jalkala, A., Kuitunen, A., & Soppe, B. (2019). Legitimacy Under Institutional Change: How incumbents appropriate clean rhetoric for dirty technologies. *Organization Studies*, *40*(3), 395–419. https://doi.org/10.1177/0170840617736938

Patton, M. (2002). Chapter 5 Section: Purposive Sampling. In *Qualitative Research and Evaluation Methods* (3rd ed., pp. 230–246). Thousand Oaks, CA: Sage Publications.

Pitelis, C. N., & Teece, D. J. (2018). The New MNE:'Orchestration' Theory as an Envelope of "Internalisation" Theory. *Management International Review*, *58*(4), 523–539.

Republic of South Africa. (2019). Act No. 15 of 2019: Carbon Tax Act, 2019. *Government Gazette*, *647*(42483), 1–65. Retrieved from https://www.gov.za/sites/default/files/gcis_document/201905/4248323-5act15of2019carbontaxact.pdf

Sanderink, L., & Nasiritousi, N. (2020). How institutional interactions can strengthen effectiveness: The case of multi-stakeholder partnerships for renewable energy. *Energy Policy*, *141*. https://doi.org/10.1016/j.enpol.2020.111447

Schriber, S., & Löwstedt, J. (2018). Managing asset orchestration : A processual approach to adapting to dynamic environments. *Journal of Business Research*, *90*, 307–317. https://doi.org/10.1016/j.jbusres.2018.05.027

Sen, S., Kotlarsky, J., & Budhwar, P. (2020). Extending organizational boundaries through outsourcing: Toward a dynamic risk-management capability framework. *Academy of Management Perspectives*, *34*(1), 97–113. https://doi.org/10.5465/amp.2015.0191

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390–1412. https://doi.org/10.1177/0149206310385695

Sovacool, B. K., & Griffiths, S. (2020). The cultural barriers to a low-carbon future: A review of six mobility and energy transitions across 28 countries. *Renewable and Sustainable Energy Reviews*, *119*(September 2019). https://doi.org/10.1016/j.rser.2019.109569

Stadler, C., Helfat, C. E., & Verona, G. (2013). The impact of dynamic capabilities on resource access and development. *Organization Science*, *24*(6), 1782–1804. https://doi.org/10.1287/orsc.1120.0810

Teece, D. J. (2018a). Business models and dynamic capabilities. *Long Range Planning*, *51*(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J. (2018b). Business models and dynamic capabilities. *Long Range Planning*, *51*(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J. (2018c). Tesla and the Reshaping of the Auto Industry. *Management and Organization Review*, *14*(3), 501–512. https://doi.org/10.1017/mor.2018.33

Ting, M. B., & Byrne, R. (2020). Eskom and the rise of renewables: Regime-resistance, crisis and the strategy of incumbency in South Africa's electricity system. *Energy Research and Social Science*, *60*. https://doi.org/10.1016/j.erss.2019.101333

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, *19*(6), 349–357. https://doi.org/10.1093/intqhc/mzm042

Union of Concerned Scientists. (2017). Benefits of Renewable Energy Use. Retrieved from https://www.ucsusa.org/resources/benefits-renewable-energy-use

United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. United Nations Sustainable knowledge platform. In *Sustainable Development Goals*. https://doi.org/https://sustainabledevelopment.un.org/post2015/transformingourworld

Vakulchuk, R., Overland, I., & Scholten, D. (2020). Renewable energy and geopolitics : A review. *Renewable and Sustainable Energy Reviews*, *122*.

Vanpoucke, E., Vereecke, A., & Wetzels, M. (2014). Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach. *Journal of Operations Management*, *32*(7–8), 446–461. https://doi.org/10.1016/j.jom.2014.09.004

Warneryd, M., Håkansson, M., & Karltorp, K. (2020). Unpacking the complexity of

community microgrids: A review of institutions' roles for development of microgrids. *Renewable and Sustainable Energy Reviews*, *121*(January). https://doi.org/10.1016/j.rser.2019.109690

Zhao, E. Y., Greg, F., Lounsbury, M., & Miller, D. (2017). Optimal distinctiveness: broadening the interface between institutional theory and strategic management. *Strategic Management Journal*, *38*(1), 93–113. https://doi.org/10.1002/smj

APPENDIX 1: INTERVIEW QUESTIONS

The researcher indicated to the interview participants that all the questions posed to them (in Table 38 and Table 39 below) should be answered from their own experience and that they should elaborate on what they have experienced.

Table 38: Core interview questions

Index	Interview questions	Link to the research question
1	Could you tell me how did you get involved in the renewable energy sector?	This is the opening question
2	What are the strategic outcomes that your organisation is aiming to achieve in the renewable energy sector?	This is an outcome question and may also address RQ 3
3	What are the factors that create challenges in delivering the outcomes noted for your organisation: a) Externally to your organisation? b) Internally to your organisation?	RQ 1 and RQ 2
4	What are the factors that enable your organisation to address its challenges in delivering the outcomes noted: a) Factors external to your organisation? b) Factors internal to your organisation?	RQ 4
5	a) How does your organisation navigate the multiple demands that you have already discussed? b) What resources and capabilities does your organisation leverage to make this work and how do you manage, organise and coordinate these?	This is a process question which addresses RQ 4
6	How do you evaluate the extent to which your organisation has achieved it intended strategic outcomes?	This builds on the outcome question and also links to RQ 3
7	As a final question, let's look forward. What does the future hold for renewable energy?	This is the concluding question

Source: Author's own compilation

Table 39: Supporting interview questions

Index	Interview questions	Question characteristic
1	Could you please tell me more about that?	Probing non-leading question
2	Could you clarify what you mean by <insert variable related to the matter of interest>?	Clarifying question in relation to a particular variable

Source: Author's own compilation

APPENDIX 2: INTERVIEW PROTOCOL

Step	Description	Completed (mark with X)
1	**Greetings** Good (morning or afternoon). Thank you for agreeing to the interview. *The participant may ask for the researcher's background. Only convey what is in the public domain and certain details of Masters.* IF PARTICIPANT HAS NOT SIGNED THE INFORMED CONSENT STATEMENT, THIS NEEDS TO BE DONE, OR THE INTERVIEW NEEDS TO BE RESCHEDULED IF THE PARTICIPANT CANNOT GET TO IT	
2	**Audio recording-initiate** Start the recording and notify participant beforehand 1. Zoom platform 2. IPAD	
3	**Informed consent statement** Read out the informed consent statement and ask if the participant agrees, including the arrangement for the audio recording and transcription services. Then note that both the researcher and participant have signed copies of the informed consent statement.	
4	**Commence interview questions** Begin the interview and go through each of the questions. Use the supporting questions, where needed.	

		Question	**Completed (mark with an X)**
		Q1	
		Q2	
		Q3a	
		Q3b	
		Q4a	
		Q4b	
		Q5a	
		Q5b	
		Q6	
		Q7	
6	**Conclusion** Thank the participant for the interview. *If the participant asks for the report, then state that it can be made available after all formal processes at the university and when the report is available on the public domain.* *If the participant asks for anything else, ensure that there is no conflict of interest in what is being asked. The participant may wish to run ideas by you. This is fine as long as there is no conflict of interest.*		
7	**Request for additional referrals** Ask the participant if they send through network referrals. This must be done whilst the audio recording is on, as evidence.		
8	**Audio recording- Terminate process** Inform the participant that the audio recording will be stopped.		

	1. End recording on the Zoom platform 2. End recording on the IPAD. Convert the audio recording on the Zoom platform when the call ends	
9	**Closure and greetings**	

APPENDIX 3: NON-DISCLOSURE AGREEMENT

TRANSCRIPTION SERVICE

Non-disclosure Agreement

for transcription services

Service provider Name: _____

Service provider Contact details: _____

Service provider Address: _____

1. The above service provider has been contracted to provide transcription services to the Gordon Institute of Business Science (GIBS) and [include name of service provider here] as part of the Social Impact and Technology case study. In doing so, the service provider will receive confidential information to be transcribed.
2. The service provider hereby undertakes not to use the confidential information for any purpose other than transcribing it for the project.
3. The service provider undertakes to keep the confidential information secure, and not to disclose it to, or share it with any third party.
4. The undertakings in clauses 2 and 3 above apply to all of the information disclosed for the purpose of the project, regardless of the way or form in which it is disclosed or recorded.
5. The service provider undertakes to keep the confidential information secure until all copies and records of the confidential information has been successfully returned to the project leaders.
6. The service provider will not retain any copies or records of the confidential information.
7. Neither this agreement nor the supply of any information grants the service provider any license, interest or right in respect of any intellectual property rights.
8. The undertakings in clauses 2 and 3 will continue in force indefinitely.

_____ _____

Signature Date

_____ _____

Signature of witness Date

Name of witness

APPENDIX 4: INFORMED CONSENT FORM FOR INTERVIEW

Dear Sir/Mam,

I am currently registered for the degree Master of Philosophy in Corporate Strategy at the Gordon Institute of Business Science at the University of Pretoria. I am conducting research on factors impacting organisations in the renewable energy sector in South Africa. Our interview is expected to last about an hour and will help to understand these factors towards my research focus. I hereby also request your permission to record the interview into an electronic audio format and submit the audio recording to a transcription service to assist with my analysis. The transcription service provider will be issued with a non-disclosure agreement to ensure that confidentiality and anonymity is maintained in respect of all aspects of the interview.

Your participation is voluntary, and you can withdraw at any time without penalty. All data will be stored and reported without identifiers.

If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher name: Sivenesan Govender

Email: 19405872@mygibs.co.za

Phone: +27 72 737 3685

_____

Research Supervisor Signature

Email: _____

Phone _____

_____ _____

Signature of participant Date

_____ _____

Signature of researcher Date

APPENDIX 5: INVITATION EMAIL

The following invitation email was used to engage with and secure potential interview participants.

Dear Sir/Mam,

I am currently registered for the degree Master of Philosophy in Corporate Strategy at the Gordon Institute of Business Science at the University of Pretoria. I am conducting research on factors impacting organisations in the renewable energy sector in South Africa. I would appreciate the opportunity to schedule an interview with you, or any of your colleagues that you could refer me to that may be suited to this area, to leverage your expertise in the sector towards my research focus. The interview is expected to take about an hour.

I have attached an informed consent letter that stipulates the conditions around the interview. Should you be willing to participate in the interview on the Zoom platform, at a date and time to be determined, I shall upload this informed consent letter onto a digital signature platform for both our signatures and provide you with the signed copy before the interview.

I look forward to hearing from you.

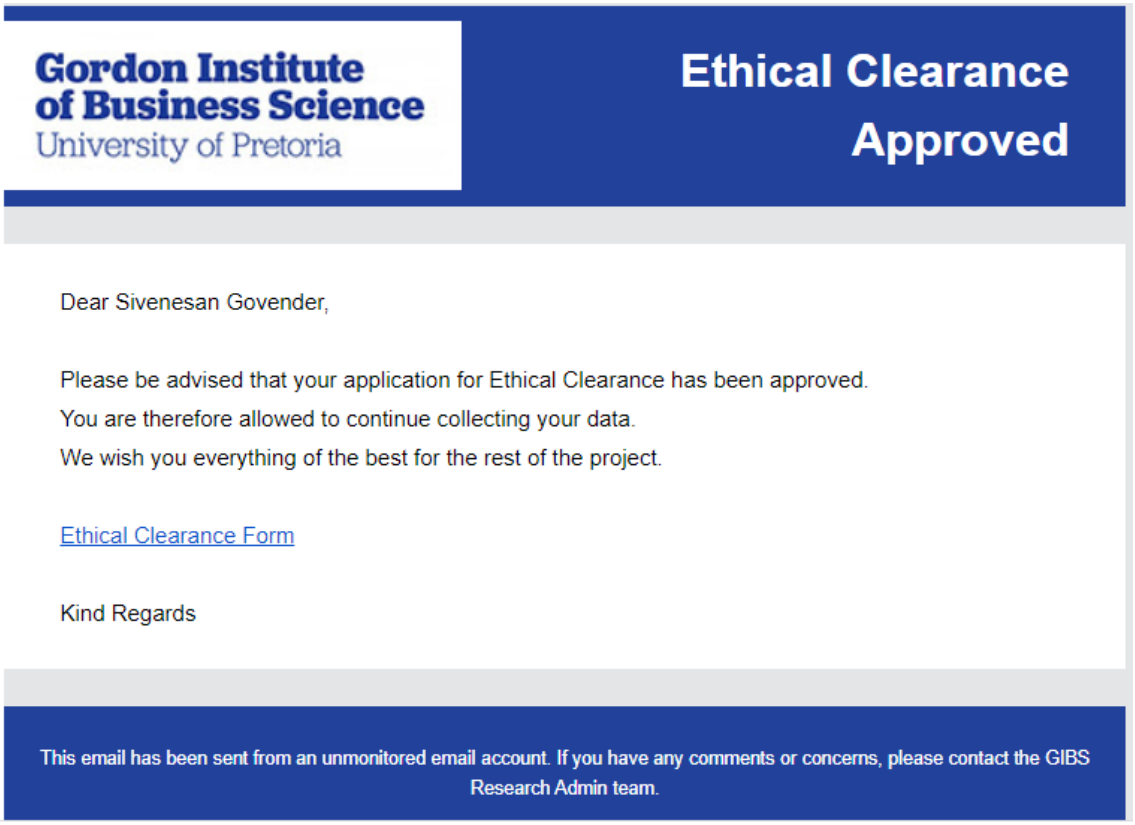
Kind regards

Sivenesan Govender

+27 72 737 3685

19405872@mygibs.co.za

APPENDIX 6: ETHICAL CLEARANCE APPROVAL



Gordon Institute of Business Science
University of Pretoria

Ethical Clearance Approved

Dear Sivenesan Govender,

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

Ethical Clearance Form

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

Figure 12: Ethical clearance approval

Source: Gordon Institute of Business Science

APPENDIX 7: LIST OF CODES

Table 40 includes the list of codes from the coding process. These are arranged according to theoretical category, theme and coding category.

Table 40: List of codes

Theoretical category	Level 2 Theme	Level 1 coding category
Context	Market factors	Impact of tax on renewable energy transition
Context	Institutional factors	Institution
Context	Market factors	Limitations of cost of solar for society
Context	Market factors	Lower cost of battery storage is improving renewable energy capacity
Context	Market factors	Market
Context	Market factors	Market forces
Context	Market factors	REIPPPP
Context	Market factors	Renewable energy has lower cost and complexity than some other forms of energy
Context	Market factors	South Africa has a competitive renewable energy environment
Context	Market factors	The regulatory environment serves as an enabling and restrictive environment
Context	Market factors	Understanding of the impact of tariffs
Dynamic capabilities	Seizing	A key challenge has been the lack or insufficient funding
Dynamic capabilities	Transforming	Adaptive management is required to cope with competing priorities
Dynamic capabilities	Sensing	Awareness of developments is required
Dynamic capabilities	Seizing	Bring the manufacturing of renewable energy products to South Africa
Dynamic capabilities	Seizing	Business model
Dynamic capabilities	Seizing	Capacity building
Dynamic capabilities	Seizing	Characteristics and competencies of leadership required
Dynamic capabilities	Seizing	Communication channels and tools are required to be effective
Dynamic capabilities	Sensing	Decreasing costs of renewable energy
Dynamic capabilities	Transforming	Definition and alignment of strategic outcomes
Dynamic capabilities	Sensing	Disruptive events
Dynamic capabilities	Sensing	Enabling external factor
Dynamic capabilities	Sensing	Enabling internal factor
Dynamic capabilities	Sensing	Energy mix includes hydrogen
Dynamic capabilities	Sensing	Engagements and developments on an international level

Dynamic capabilities	Seizing	Engineering capability is a requirement
Dynamic capabilities	Transforming	Ensure internal organisational strategic alignment for the renewable energy transition
Dynamic capabilities	Sensing	Evaluation capability is required
Dynamic capabilities	Sensing	Evaluation of achievement of intended strategic outcomes
Dynamic capabilities	Sensing	External factor creating challenge
Dynamic capabilities	Sensing	Financial sector impact due to and on renewable energy
Dynamic capabilities	Sensing	Framework
Dynamic capabilities	Sensing	Future of renewable energy
Dynamic capabilities	Sensing	Good renewable energy potential in South Africa
Dynamic capabilities	Sensing	Impact of government in the renewable energy transition
Dynamic capabilities	Seizing	Impact of network on renewable energy initiatives
Dynamic capabilities	Seizing	Importance of human resources and the management thereof
Dynamic capabilities	Sensing	Internal factors creating challenges
Dynamic capabilities	Seizing	Inter-organisational coordination and relationships
Dynamic capabilities	Seizing	Leadership
Dynamic capabilities	Seizing	Management of skills for the renewable energy value chain is required
Dynamic capabilities	Transforming	Managing business to business relationships
Dynamic capabilities	Transforming	Managing business to customer relationships
Dynamic capabilities	Seizing	Managing challenges around building competence
Dynamic capabilities	Sensing	Managing the impact of policy on the renewable energy transition
Dynamic capabilities	Sensing	Managing the impact of politics on the renewable energy transition
Dynamic capabilities	Seizing	Matching capability
Dynamic capabilities	Seizing	Mechanism to navigate multiple demands
Dynamic capabilities	Seizing	Mobilise international resources due to technical and capacity gaps
Dynamic capabilities	Seizing	Multi-skilled and dedicated resources are required
Dynamic capabilities	Seizing	Partnerships are required for the renewable energy transition
Dynamic capabilities	Seizing	People as an enabling internal factor
Dynamic capabilities	Seizing	Private sector participation is critical in the renewable energy transition
Dynamic capabilities	Transforming	Process to arrive at efficiencies

Dynamic capabilities	Sensing	Public sector enablement is critical for the renewable energy transition
Dynamic capabilities	Sensing	Recognition and developments made on climate change
Dynamic capabilities	Seizing	Relationships
Dynamic capabilities	Seizing	Risk management capability is required
Dynamic capabilities	Seizing	Solar
Dynamic capabilities	Transforming	Structure
Dynamic capabilities	Seizing	Technical skills are critical for the renewable energy transition
Dynamic capabilities	Sensing	Technological developments
Dynamic capabilities	Seizing	Time
Dynamic capabilities	Seizing	Type of internal resources
Dynamic capabilities	Sensing	Understanding of the supplier landscape
Dynamic capabilities	Seizing	Understanding the type and supply of skills is critical for the renewable energy transition
Optimal distinctiveness	Tension between conformity and differentiation	Coping with competing demands
Optimal distinctiveness	Stakeholder perception	Investors
Optimal distinctiveness	Stakeholder perception	Managing pressure
Optimal distinctiveness	Stakeholder perception	Stakeholder management
Orchestrating mechanisms	Ability to combine selected resources	Ability to combine selected resources
Orchestrating mechanisms	Ability to combine selected resources	Leverage of cross-industry skills

Source: Author's own compilation