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Aligning Key Performance Indicators With Integrated Thinking Principles: Insights From Academic Literature and South African Organisations' Extra-Financial Reports

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ABSTRACT

The aim of this paper is to identify which principles of integrated thinking can be applied by an organisation to develop holistic key performance indicators (KPIs) and to outline current practices in disclosing KPIs that align more broadly with an integrated thinking logic. To do so, an analysis of the academic literature is performed to identify the core integrated thinking principles that can be used as part of a performance evaluation structure that considers both financial and extra-financial matters. The identified principles are applied to a sample of South African-listed entities' extra-financial reports to illustrate how integrated thinking principles are incorporated into the KPIs being reported. Eight core themes specific to incorporating integrated thinking in KPIs are identified. These include (1) assurance, (2) timeframe, (3) coverage of the Sustainable Development Goals and multi-capitals, (4) factors influencing the achievement of the metric, (5) stakeholder engagement, (6) materiality, (7) the level of application and (8) post-implementation reviews. The analysis reveals that KPIs have incorporated more principles of an integrated thinking logic from 2013 to 2021 but that there is room for improvement. To facilitate this, examples of best and worst practices for reporting on KPIs are outlined. The study is among the first to outline formally the coverage of literature on integrated thinking, specifically in the context of performance evaluation and to assess the related performance evaluation disclosures in accordance with integrated thinking principles. The study offers practitioners and academics a framework for evaluating how KPIs can be set and evaluated in the context of integrated thinking.

1 | Introduction

A multi-capital approach to operations, internal processes, strategic decisions, and risk management is becoming more common (Herath et al. 2021). This holistic business mindset is complemented by a growing appreciation of the impact of environmental, social and governance (ESG) considerations (Roberts et al. 2021). Referred to as 'integrated thinking', the aim is to promote:

> the active consideration by an organization of the relationship between its various operating functional units and the capitals that the organization uses or affects. Integrated thinking leads to integrated decision-making and actions that consider the creation, preservation or erosion of value over the short, medium and long term (IIRC 2021, 53).

A challenge when adopting integrated thinking is that the goals of management and executives are often focused exclusively on financial issues. A holistic performance evaluation structure, which incorporates social and environmental factors in addition to economic ones, is one tool, which can be used to promote a more sustainable outlook (Stubbs and Higgins 2014).

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Key performance indicators (KPIs) can be employed to measure progress toward the achievement of strategic objectives and to compensate management accordingly. However, the adoption of integrated thinking needs to be underscored by a sophisticated framework for performance evaluation, which considers more broadly extra-financial considerations (Carnegie et al. 2021; Herbert and Graham 2021).

The focus on a holistic approach to managing financial and extra-financial metrics is also aligned with sustainability-related frameworks such as the Global Reporting Initiative (GRI), the Task Force on Climate-Related Financial Disclosures (TCFD), the International Integrated Reporting Framework and the sustainability standards issued by the International Sustainability Standards Board (ISSB). Most recently, the European Union's Corporate Sustainability Reporting Directive (CSRD) expands significantly on existing non-financial reporting requirements, with at least 50,000 companies expected to be impacted by the reporting requirements (KPMG 2023). In-scope organisations must prepare their extra-financial reports according to the European Sustainability Reporting Standards (ESRS) and have these reports independently assured (KPMG 2023). This iterates the need to understand how performance evaluation structures can be used to support extra-financial matters that arise due to regulation, guidelines, institutional pressure, stakeholder expectations and best-practice initiatives.

Understanding how companies can adopt an integrated approach to performance evaluation structures provides the motivation for the current research. The aim of this paper is to identify which principles of integrated thinking can be applied by an organisation to develop holistic KPIs and to outline current practices in disclosing KPIs that align more broadly with an integrated thinking logic. To do so, two research questions (RQ) are addressed:

RQ1. *What are the principles of integrated thinking, according to the academic literature, which can be applied to develop more holistic KPIs*?

RQ2. *Is there evidence of integrated thinking in the reporting of KPIs by listed organisations*?

This paper deals with the development of core integrated thinking themes or principles, which can be used to evaluate the extent to which KPIs incorporate both financial and extra-financial dimensions. A content analysis of the academic literature is used to determine the core themes which make up a KPI structure which is aligned with integrated thinking principles. The identified themes are applied to a sample of South African listed entities to illustrate how integrated thinking principles are incorporated into KPIs and the extent to which KPIs, which are not only financially focused, are being included in annual, sustainability or integrated reports.

A review of the prior literature reveals eight core themes of integrated thinking specific to reporting on KPIs. These include (1) assurance, (2) timeframe, (3) coverage of the SDGs and multi-capitals, (4) factors influencing the achievement of KPIs, (5) stakeholder engagement, (6) materiality, (7) level of application and (8) post-implementation review. The application to South African organisations reveals that KPIs have incorporated a higher degree of principles of an integrated thinking logic from 2013 to 2021, but there is room for improvement. To facilitate this, examples of best and worst practices for reporting on KPIs are outlined.

This research makes at least four contributions. Firstly, the analysis of the academic literature provides a detailed account of the state of research on performance evaluation. A useful reference is provided for practitioners and academics interested in the emergence and development of integrated thinking applied specifically in the context of performance evaluation.

Secondly, the current paper focuses on the type and content of KPIs from an emerging economy. Data are collected from South Africa because the country is well regarded for its contribution to sustainability and integrated reporting. At the same time, it is one of the most important economies in Africa and a member of BRICS[1]. As a result, a review of how South African listed companies are addressing integrated thinking in performance evaluation structures addresses the need for research from emerging economies (Ecim and Maroun 2023; Ferreira et al. 2024) while also generating findings that will be internationally relevant.

Thirdly, the study outlines performance indicators that can be used by an organisation to operationalise integrated thinking and report holistically on financial and extra-financial performance. The findings will be relevant for investors coming under increasing pressure to factor social and environmental issues into their mandates and engagements with companies. Non-governmental organisations, regulators and other stakeholders will also be able to rely on this study's findings to inform their understanding of the organisations with which they are engaging.

Finally, instances of best and worst practice disclosures regarding KPIs are detailed. This is useful for preparers wanting to review their corporate reports and make improvements to how they communicate performance-related information to stakeholders and provide empirical evidence relating to performance evaluation disclosures.

The remainder of this paper is organised as follows. Section 2 provides an analysis of the academic literature and is used to identify the core principles of integrated thinking applicable to KPIs. Section 3 details the methodology to apply the themes to a sample of organisations. Section 4 presents and discusses the results. Section 5 concludes and identifies areas of future research.

2 | Development of Integrated Thinking Principles Applicable to KPIs

2.1 | Academic Article Search Protocol

A systematic inquiry was conducted to identify articles on the Scopus Database. The Scopus Database was used based on the merit of its discerning filtration criteria and its incorporation of reputable journals characterised by robust peer-reviews (Dumay et al. 2016; Rinaldi et al. 2018). The terms 'key performance

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indicator'; 'performance indicator'; 'KPI' or 'performance evaluation' were searched in the titles, keywords or abstracts of the articles on the database. The filtration criteria included 'integrated reporting' and 'integrated thinking'. This was because papers addressing 'integrated reporting' or 'integrated thinking' offer insights into the disclosure practices in relation to KPIs. The thematic categorisation was refined to encompass KPIs across various domains, specifically: business, finance, accounting, assurance, sustainability, capitals, management, risk and policy. All documents, including 'final' and 'in press' publications, were evaluated. The search was initiated from 1 January 2013 to 31 March 2023. This provides a 10-year period over which to assess the progress and state of research on KPIs and also corresponds to the formal recognition and implementation of 'integrated thinking' (IIRC 2013).

2.2 | Output of the Search Protocol and Methodology

The preliminary search yielded 979 documents. Each was read to gauge its relevance (Dumay et al. 2016). The lead researcher reviewed the title, abstract, and content of the articles. Those that were inapplicable due to the content or subject area were excluded from the study. To ensure completeness, the search was re-performed after 6 months, covering the same period. These papers were thoroughly screened to confirm that they explored integrated reporting disclosure practices and the operationalisation of an integrated thinking logic in the context of performance evaluation structures.

Only articles included in the Scopus Database are addressed by the current study. As the intention of the academic literature assessment is to gauge the direction being taken by KPI research and not to provide a detailed count of earlier studies, this is not considered to be a material limitation (Rinaldi et al. 2018).

After removing inapplicable papers, 667 academic sources remained. The features of each are summarised and classified by characteristics (methodology as per Ecim and Maroun 2023). Refer to Table 1.

The results of the search protocol are included in Sections 2.1–2.3.

2.3 | Volume of Research Dealing With KPIs

Figure 1 shows a steady increase in the volume of research dealing with KPIs from 2013 to 2021. There is a significant jump in the number of published sources from 2021 to 2022.

Steady research output from 2013 to 2021 is consistent with the fact that both the academic and practitioner communities have been focused on how to expand financial reporting to address economic and environmental concerns (Herath et al. 2021; Malafronte and Pereira 2021). The notable increase from 2021 to 2022 can be attributed to two factors.

Firstly, entities which are committed to integrated thinking will be well-positioned to respond to challenges such as climate change, inequality, and global health issues such as COVID-19 (Atkins et al. 2020). An integrated thinking logic allows organisations to be proactive and innovative in risk management, strategies, operations and performance evaluation structures. Consequently, the COVID-19 pandemic iterated the importance of incorporating financial and extra-financial metrics into key performance indicators and reinforced the importance of the governing body in considering the connections in changing

TABLE 1 | Coding of the academic sources.

Characteristic	Details
Publication information	The content, publication year, abstract and keywords
Research objectives	The purpose and objectives of the research
Key themes	The focus of the research categorised KPIs, integrated thinking, integrated reporting and a combination of all areas
Affiliated country/ies	The country that the academic source was published in
Research methodology	Research methods are categorised as case study, commentary/normative/policy, content/historical analysis, survey/questionnaire/ other empirical research
Focus of enquiry	The research is classified as macro-, meso- or micro-level research. The macro-level explores social structures and their relevance for KPIs. The meso-level deals with how organisations interpret and apply integrated thinking in their KPI disclosures. The micro-level deals with the application of KPIs by specific organisations (adapted from Rinaldi et al. 2018)
Epistemological paradigm	The epistemology is categorised as positivist, interpretive or critical. Positivism focuses on quantitative methods and aims to achieve distinct objectives. The interpretive approach employs qualitative techniques and a subjective understanding of social constructs. The critical perspective is normative in nature and supports specific viewpoints, advocating for social critique and transformative change

Source: Adapted from Ecim and Maroun (2023).

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economic, social, and environmental conditions in KPIs (de Villiers et al. 2020; Myeza et al. 2023). A growing body of research evaluates integrated thinking but stops short of exploring how this can be directly incorporated into KPIs.

Secondly, in 2022, the ISSB released two exposure drafts explaining how organisations ought to deal with the interconnections among economic, environmental and social issues (ISSB 2021). At about the same time, the draft European Sustainability Reporting Standards were released. This garnered academic interest in exploring how these sustainability-related standards would impact risk assessments, strategies, operations, and, to a lesser extent, the performance evaluation structures.

2.4 | KPI Research by Jurisdiction

Figure 2 shows KPI research by country.

In total, 52% of research is from developed countries. The 48% from emerging economies comes from India, Indonesia, Malaysia, South Africa and Russia. No other emerging

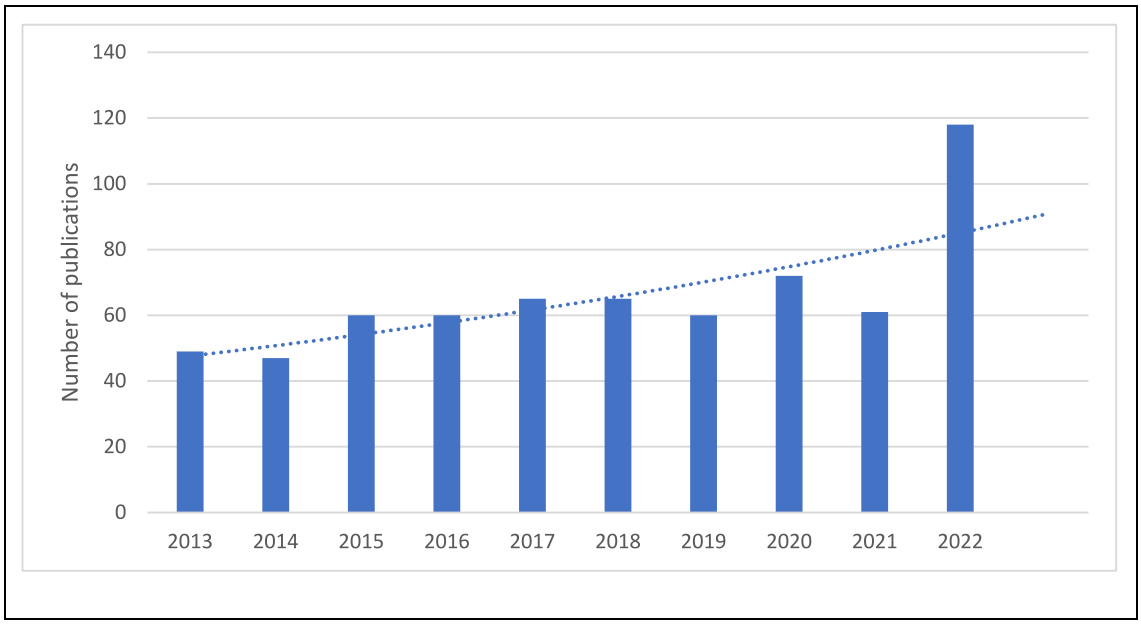

FIGURE 1 | Volume of academic research focusing on KPIs.

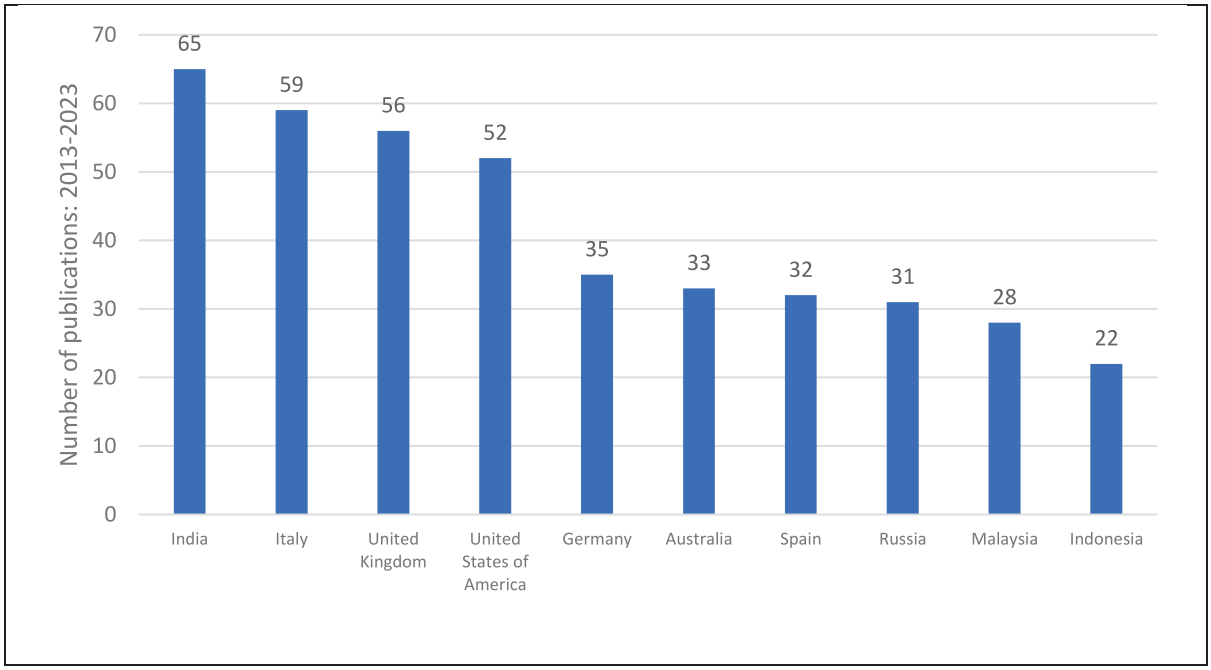

FIGURE 2 | KPI research by jurisdiction.

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economies produced significant research on KPIs between 2013 and 2023.

Emerging economies frequently undergo a period of accelerated economic expansion and development. As businesses grow, there is an increasing need for efficient performance measurement and reporting to ensure sustainable growth, which aligns with corporate and national development objectives (Izzo et al. 2020). To bolster investor confidence, organisations operating in emerging economies must demonstrate transparency and good corporate governance, where progress can be tracked according to robust KPIs (Husnah et al. 2023). This provides a possible reason for the strong focus on KPI research in key developing economies.

Given the importance of regulatory compliance and transparent corporate reporting for reducing information asymmetries, much of the research from developing economies focuses on aligning KPIs with evolving regulatory requirements and reporting more effectively (Dissanayake 2021). The developing economies highlighted in Figure 2 are also dependent on small- and medium-sized enterprises (SMEs). Consequently, KPI-related research addresses the challenges encountered when developing KPIs for less complex entities and practical recommendations for scaling the implementation of, and reporting on, KPIs (Negri et al. 2021).

Only 2% (12 publications) of the KPI research originated from South Africa. South Africa's dominance in integrated thinking and integrated reporting (Ecim and Maroun 2023) is not matched by a corresponding level of research on performance evaluation. This iterates the need for additional research on performance evaluation and reporting by South African entities. The same applies more generally to how KPIs are developed, implemented and reported on by other key African economies such as Nigeria, Egypt, and Kenya.

Italy (9%), UK (8%), USA (8%), Germany (5%) and Australia (5%) rank second to sixth, respectively, for KPI research output. The applicable studies cover the changing business environment in each economy, including sustainability issues (Frost et al. 2005; Maltz et al. 2018), regulatory shifts (Elzahar et al. 2015) and the demand for advanced performance measurement techniques (Kristensen et al. 2022). Researchers investigated the integration of non-financial KPIs with organisational goals (Rodríguez-Gutiérrez et al. 2019). The emergence of big data and data analytics has played a significant role in KPI research for developed economies. Research has focused on the various ways in which organisations can utilise data to enhance the development of sophisticated and real-time KPI feedback systems (Austin et al. 2021). The studies highlighted the significance of digital transformation in measuring KPIs and making informed decisions. The COVID-19 pandemic prompted research into the development of KPIs for remote work situations. The studies investigated the methods for accurately assessing employee performance and productivity within distributed work settings (Atkins et al. 2020; Rahman et al. 2022). The impact of the EU's CSRD would also have resulted in increased focus on integrating extra-financial matters into the sub-systems of organisations (KPMG 2023). The key journals in which KPI-related research is published are detailed in Appendix A.

2.5 | The Focus, Epistemological Paradigms and Methods of the Research

The focus of KPI research is on the meso- (42%) and micro-levels (37%). Refer to Table 2.

Micro-level research focuses on individual KPIs or specific performance metrics. The objective was to establish and develop precise performance metrics for specific areas, processes or functions within an organisation (Wannes and Ghannouchi 2019).

TABLE 2 | The focus of enquiry of KPI research.

	Micro-level	Meso-level	Macro-level	Total	Emerging economies	Developed economies
2013	17	22	10	49	16	33
2014	16	17	14	47	18	29
2015	11	34	15	60	35	25
2016	14	27	19	60	29	31
2017	25	28	12	65	33	32
2018	26	28	11	65	28	37
2019	21	26	13	60	42	18
2020	30	30	12	72	36	36
2021	29	26	6	61	33	28
2022	54	35	29	118	46	72
2023	3	4	0	10	3	7
Total	249	277	141	667		
Emerging economies	122	138	59			
Developed economies	127	139	82			

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This involved identifying suitable data, selecting appropriate collection methods and establishing benchmarking criteria (Stricker et al. 2017). The research highlights the tactical implementation of KPIs by organisations, including how KPIs can be used to monitor, control and strengthen performance in specific parts of a business (Rahman et al. 2022).

At the meso-level, researchers examine how KPIs align with an organisation's overall strategic objectives. Studies at this level analyse the impact of change management on implementing and integrating KPIs in operations (Kimhi and Oliel 2019). This requires a cultural shift before integrated thinking becomes established at multiple levels in the organisation.

Macro-level research explores the role of KPIs in regulatory frameworks and global reporting standards (Boiral and Henri 2015). This includes how KPIs are used to measure compliance and adherence to international guidelines. The implementation and operationalisation of KPIs specific to certain sectors or industries are examined (Dissanayake 2021). Industry-wide trends and broader implications of KPIs are explored with a focus on how economic indicators (Herbert and Graham 2021), corporate governance (Solomon 2013) and market dynamics (Busco et al. 2017) influence performance evaluation structures.

KPI research in emerging economies has been performed primarily at the micro- (122; 38%) and meso-levels (138; 43%) with a smaller focus on the macro-level (59; 18%). Emerging economies often face constraints in terms of financial resources and specialised knowledge. Conducting research at the micro-level, which involves analyzing specific KPIs, enables a more practical and manageable approach to measuring performance. It allows organisations to efficiently implement tailored solutions that address their specific limitations. Research has focused on how the development and implementation of KPIs can assist companies in assessing the efficiency and effectiveness of internal processes, leading to improved productivity and competitiveness (Niyommaneerat et al. 2023). Studies conducted in emerging economies necessitate the establishment of KPIs specifically designed to evaluate performance in local and niche markets, given that universal KPI norms may not always be directly relevant in these contexts (Kimhi and Oliel 2019). The research is further categorised based on epistemological paradigm and methodology.

KPI research predominantly adheres to a positivist paradigm (49%), followed by an interpretive approach (29%), with critical epistemologies less frequently investigated (22%).

The majority of positivist research employed content/historical analyses (43%) and survey-based empirical research (29%). Interpretive research focuses on examining the contextual (Rahman et al. 2022), semantic (Domínguez et al. 2019) and societal (Hristov et al. 2022) dimensions of KPIs. Researchers in this field explore how KPIs are interpreted within organisational cultures, their impact on decision-making, and broader social implications associated with their use. Despite the growing demand for KPIs addressing qualitative considerations, a significant portion of KPIs remains quantitative in nature (Keddie and Magnan 2023), making positivist methods a natural fit for studying and assessing them. Researchers aim to establish empirical relationships between KPIs and performance outcomes (Velte 2019). This is vital for organisations seeking to identify which KPIs have a direct impact on their objectives, enabling them to prioritise their performance measurement efforts.

Critical studies examine the ethical implications of KPI usage. This includes assessing whether KPIs may inadvertently lead to negative consequences, such as unethical behavior or neglect of social and environmental responsibilities (Di Vaio et al. 2021).

Based on the prior research above, it is clear that more focus needs to be placed on an overall guidance to setting KPIs incorporating a blend of financial and extra-financial considerations, particularly in the context of emerging economies. Refer to Table 3.

Finally, Table 4 shows the quantity of research papers published in journals with a minimum of eight publications.

Journal of Cleaner Production (JCP) (34 publications) accounts for 5% of total publications on KPIs. Half of the publications in this journal (53%) were published as recently as 2019. Following *JCP* are *International Journal of Productivity and Performance Management* (*IJPPM*) (23 publications) and *Benchmarking: An International Journal (BIJ)* (17 publications). Similar to *JCP*, more KPI research was published after 2019.

KPI research has mainly focused on a managerial context with 255 publications listed in management journals. These include *Management Accounting Research (MAR)*, *IJPPM*, *Total Quality Management and Business Excellence*. KPI research in accounting (34 publications) and auditing (5 publications) journals is limited. *Sustainability Accounting*, *Management and Policy Journal (SAMPJ)*, *Accounting*, *Auditing and Accountability Journal (AAAJ)*, *Australian Accounting Review (AAR) and South African Journal of Accounting Research (SAJAR)* are among the top publishers in the accounting sphere. *AAAJ* is also the dominant journal in the auditing sphere. As a result, KPIs in an accounting and auditing context need to be further examined, which forms part of the focus of the current paper.

2.6 | Principles of Integrated Thinking Applicable to KPIs

The core themes from each of the 667 articles were recorded on an open coding theme register. Thereafter, the lead researcher and two research assistants used axial coding to identify the broad themes of integrated thinking, which were linked to performance evaluation. To confirm that all of the key ideas were captured, the keywords of the 667 articles were processed using VosViewer software (Van Eck and Waltman 2017). This provided a visual illustration (untabulated) of the temporal evolution of emerging research nodes and key ideas. The prominence of each node in prior research is indicated by its size, and the distances between nodes represent the interconnections among them, with a shorter distance indicating interconnected topics, themes or keywords (Bellucci et al. 2020; Caputo et al. 2021). This was used as a type of calibration check to ensure that all of the

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TABLE 3 | Research methodologies and epistemological paradigms.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	Emerging economies	Developed economies
Critical	6	3	17	13	23	21	9	16	12	25	2	147	69	78
Case study	3	1	2	3	11	12	3	6	2	4	0	47	20	27
Commentary/normative/policy	0	0	2	1	0	3	0	1	0	1	0	8	5	3
Content/historical analysis	0	0	7	2	4	1	3	4	1	5	0	27	12	15
Survey/questionnaire/other empirical research	3	2	6	7	8	5	3	5	9	15	2	65	32	33
Interpretive	8	11	16	16	27	24	15	23	19	34	3	196	91	105
Case study	0	1	4	4	11	10	3	7	6	4	0	50	21	29
Commentary/normative/policy	0	1	1	2	1	4	1	2	1	2	1	16	8	8
Content/historical analysis	2	2	5	4	5	4	6	2	3	11	1	45	20	25
Survey/questionnaire/other empirical research	6	7	6	6	10	6	5	12	9	17	1	85	42	43
Positivist	35	33	27	31	15	20	36	33	30	59	5	324	159	165
Case study	6	7	1	4	3	4	5	2	8	6	1	47	24	23
Commentary/normative/policy	8	7	5	9	2	6	0	0	1	4	0	42	19	23
Content/historical analysis	11	12	15	12	2	7	21	21	8	27	4	140	64	76
Survey/questionnaire/other empirical research	10	7	6	6	8	3	10	10	13	22	0	95	52	43
Total	49	47	60	60	65	65	60	72	61	118	10	667	319	348
Emerging economies	16	18	35	29	33	28	42	36	33	46	3	319		
Developed Economies	33	29	25	31	32	37	18	36	28	72	7	348		

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key themes from the articles were recorded. Thereafter, the researchers used their professional judgment to categorise the eight principles of integrated thinking. This was used in conjunction with the research developed by Ferreira et al. (2024) but adapted to focus more specifically on the underlying literature that supports the principles and the practical application to organisations' extra-financial reports. This also provides a more descriptive overview of the principles to provide a richer set of empirical examples. The principles were presented at a research workshop hosted by the researchers' home institution in collaboration with both local and international universities to further refine the themes into eight distinguishable principles. Figure 3 provides a thematic summary of the prior research on integrated thinking principles that are applicable to KPIs.

The first theme deals with the assurance of KPIs. Entities should ensure that KPIs are reliable and complete (IIRC 2021). Combined assurance over KPIs facilitates integrated thinking by ensuring that the organisation's various functions, such as, for example, internal audit and those charged with governance, work together cohesively to monitor and improve performance in alignment with the companywide objectives (Prinsloo and Maroun 2021). As is the case with the audit of financial statements, assuring extra-financial information contributes to reduced information asymmetry (Donkor et al. 2021), better quality reporting (Maroun 2019) and improved stakeholder confidence in annual, integrated or sustainability reports (Farooq et al. 2024). Given the importance of KPIs for internal decision-making and users' understanding of how organisations generate value for investors and other stakeholders (Guthrie et al. 2017), organisations wanting to demonstrate their proactive approach to setting KPIs and the resulting outcomes would likely assure their KPIs.

The second theme deals with setting KPIs over the short-, medium-, and long-term. Included under this theme is the research dealing with how organisations can achieve sustainable development only if the drive for immediate financial gains is tempered (IIRC 2021; Pigatto et al. 2023). Consistent with the logic underpinning the balanced scorecard, a combination of lag and lead measures needs to be used to prevent a short-term focus on economic performance to the detriment of value generation over the long run (IRC 2018; Maroun et al. 2023).

TABLE 4 | Academic sources with more than eight publications focusing on KPIs.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Journal of Cleaner Production		1	1	4	5	5	2	4	2	8	2	34
International Journal of Productivity and Performance Management		1	3	2	1	2	3	1	2	8		23
Benchmarking: An International Journal	1	1	2	3		4		2		2		15
International Journal of Production Research	1		3	1	2	2						9
Total Quality Management and Business Excellence		2		2				2	2			8
Total	2	5	9	12	8	13	5	9	6	18	2	89

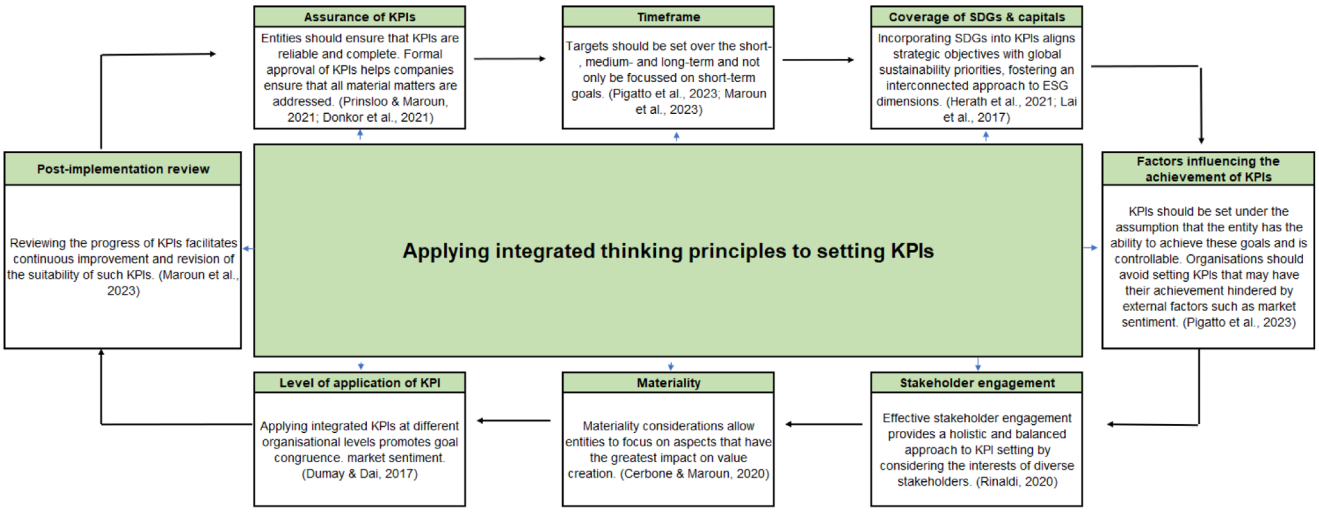

FIGURE 3 | Principles of integrated thinking in KPI disclosures. Adapted from Ferreira et al. (2024).

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The third theme considers the extra-financial metrics incorporated into KPIs. This includes coverage of the United Nations' Sustainable Development Goals (SDGs) (UN 2015) and multiple capitals. KPIs need to address how the organisation generates returns for investors and creditors (financial capital) including the tangible (manufactured capital) and intangible (intellectual capital) resources deployed in order to do so. Value cannot be framed in only financial terms. The impact on the organisation's employees (human capital), stakeholders (social and relationship capital) and the environment (natural capital) must be considered. At the same time, the entity must be mindful of the relevance of the range of social and environmental resources/capitals for its ability to generate reliable economic returns (Steenkamp et al. 2025). This is sometimes referred to as a double-materiality logic in terms of which the entity has an impact on society and the environment but is also dependent on society and the environment for essential inputs into the business model (Herath et al. 2021; Lai et al. 2017). KPIs that address the applicable capitals and their interconnections provide evidence of integrated thinking because they demonstrate how management and governing bodies oversee the range of financial and extra-financial resources at the heart of the organisation's business model and value proposition.

Theme four reminds organisations that KPIs must be achievable. At the same time, the organisation must be committed to the long-term management of different resources. It should avoid reacting prematurely to external factors such as temporary market shocks and short-term changes in stakeholder sentiment (Pigatto et al. 2023).

The fifth theme focuses on stakeholder engagement. Management needs to understand the legitimate needs of a broad group of stakeholders and how this can be incorporated into performance evaluation (Rinaldi 2020). This is in keeping with an integrated thinking logic that stresses the importance of generating value for investors, the organisation itself, and the organisation's key stakeholders (IIRC 2021).

Materiality is addressed by theme six. The extra-financial performance metrics must be based on factors that are relevant to the organisation's strategy, risk assessments and operating protocols. As discussed above, both financial and extra-financial metrics should be covered, mindful of the capitals that are most significant for how the organisation generates value for itself and its constituents (Cerbone and Maroun 2020).

Theme seven deals with the level at which KPIs are applied. Performance measures cannot only be set at the executive level; they must be applicable for different categories of managers and employees to ensure that goals are aligned to an integrated strategy and the applicable KPIs operate as a type of cultural control (Dumay and Dai 2017).

Finally, the eighth theme encourages a feedback loop for continuous improvement. Post-implementation reviews signal an integrated thinking mindset (Wu et al. 2021). They allow organisations to assess the effectiveness and relevance of their KPIs while serving as a useful "calibration check" of the organisation's strategy and risk management (De Villiers and Maroun 2017). A careful review of KPIs will also be necessary for governing bodies to discharge their fiduciary duties.

The eight themes are not exhaustive but provide a useful starting point for organisations to implement integrated thinking principles in the performance evaluation structure.

3 | Research Method

The extra-financial reports[2] of the 40 largest companies listed on the Johannesburg Stock Exchange (JSE) by market capitalisation are selected. The intention is not to develop a mathematical measure of KPIs adopting integrated thinking principles but rather to illustrate examples of how the eight themes are applied by organisations. Selecting the largest organisations controls for the possibility of a lack of resources or technical expertise to implement robust controls or a lack of experience in exercising integrated thinking and implementing KPIs (De Villiers and Hsiao 2017). As discussed in Section 1, South African companies are selected because the country has a well-developed reporting and corporate governance environment. As an emerging economy, the results will also provide insights into challenges that may be faced and require solutions.

Companies' 2013, 2017 and 2021 reports are examined. Reports prepared in 2013 were among the first to be compiled according to the International Integrated Reporting Council's Framework (IIRC 2013). The researchers selected 2021 reports because this covers the first year after the COVID-19 pandemic. The midpoint of 2013 and 2021 was also selected to assess the progression of integrated thinking principles in KPIs.

Following a similar approach to prior corporate reporting literature (Cho et al. 2014), content analysis is used to collect the data and analyze companies' primary reports. Content analysis is suitable for dealing with material not consistently formatted and including a mix of qualitative and quantitative information (Krippendorff 2013).

The study uses companywide KPIs as the unit of account to ensure contextual accuracy. The reports are examined to identify disclosures dealing with KPIs. Each KPI is evaluated based on the presence of the eight themes in Figure 3 and the frequency of the disclosures was recorded (Section 4.1). In addition, the number of mentions of KPIs, the number of pages specifically dealing with KPIs, and the total pages in the report were recorded. The size quartile and industry of the organisations were also recorded in order to provide additional insights (Section 4.2). Finally, instances of best and worst practices are also recorded to complement the analysis and to provide disclosure coding examples that illustrate the operationalisation of the respective themes (Appendix A).

To ensure all KPIs were completely captured, once the entire report was read, an additional keyword search was performed for terms including, for example, 'key performance indicator', 'KPI', 'performance evaluation', 'metric', 'evaluation' and 'key performance metrics'. Each KPI disclosure was aggregated on a thematic table by the lead researcher and allocated to the relevant themes. The thematic coding was reviewed separately by two

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research assistants to ensure the accuracy and completeness of the KPIs captured and the frequency per theme. Any discrepancies were noted and discussed with the lead researcher and research assistants and a consensus was achieved. As a result of all differences in coding being assessed, inter-coder reliability testing was not required. Scoring the 'level' of integrated thinking per KPI is deferred for future research as the objective of the current study is to provide a descriptive analysis of the evidence of principles of integrated thinking in KPI disclosures.

4 | Trends in KPI Disclosures

Figure 4 shows the total KPI disclosures per period and the related density and frequency of these disclosures. The density is a measure of how much KPI information is disclosed in the performance evaluation sections of the company, while the frequency is a measure of how much of the total report is dedicated to disclosing information about performance evaluation.

Total KPI disclosures have shown only a marginal increase of 4% from 2013 (Total = 588) to 2021 (total = 609). However, the types of KPIs have changed significantly over this time period (refer to Section 4.1). The density of disclosures showed a large increase in 2017 (Density = 0.91) which may be because of the increased corporate governance requirements relating to remuneration, which resulted in organisations providing an 'overload' of performance-related disclosures (Ecim 2024). Reports in 2017 generally tended to be longer, on average, than reports in 2013 and 2017, as organisations experimented with integrated reporting practices (Van Zijl et al. 2017). As materiality processes became refined and increased stakeholder communication took place, the density of the disclosures declined to include predominantly material information that was useful for stakeholders (Cerbone and Maroun 2020). Over an 8-year period, performance evaluation consistently represented approximately 2% of the entire report. This indicates that this area is not as extensively disclosed as, for example, risk management practices and strategies.

Exploring which principles of integrated thinking are incorporated into the KPI disclosures is assessed in Section 4.1.

4.1 | Integrated Thinking Principles Frequencies

4.1.1 | Assurance

Figure 5 shows the levels of assurance obtained. This is evaluated by recording which KPIs have an explicit statement of the type of assurance used. The increase in internal assurance (2013 = 130 KPIs; 2021 = 213 KPIs), consisting of predominantly internal audits, suggests that organisations are increasingly prioritising internal assessments coupled with internal controls to manage the type of KPIs set, in addition to confirming whether or not the relevant metric has been achieved. Internal assurance can enhance operational efficiency (Prinsloo and Maroun 2021), allow organisations to identify areas requiring improvement, minimise errors, and streamline their performance management procedures (Baboukardos et al. 2021). There are, however, limited details on how the KPIs are being assured.

There is an overall decline in the use of external assurance (2013 = 157 KPIs; 2021 = 141 KPIs) possibly because of the cost of these services (Simnett et al. 2009). This is particularly the case given that KPIs linked to extra-financial objectives can be difficult to verify. Companies may also choose to adopt a targeted approach for assuring KPIs. Only the most critical KPIs may be externally verified, while the remaining indicators are subject to internal assurance. Assurance promotes transparency and accountability (Adams and Evans 2004) and as a result, cases where KPIs are not being verified are decreasing from 2013 to 2021. Given the international trends of increased assurance, such as in the EU due to mandated sustainability assurance following

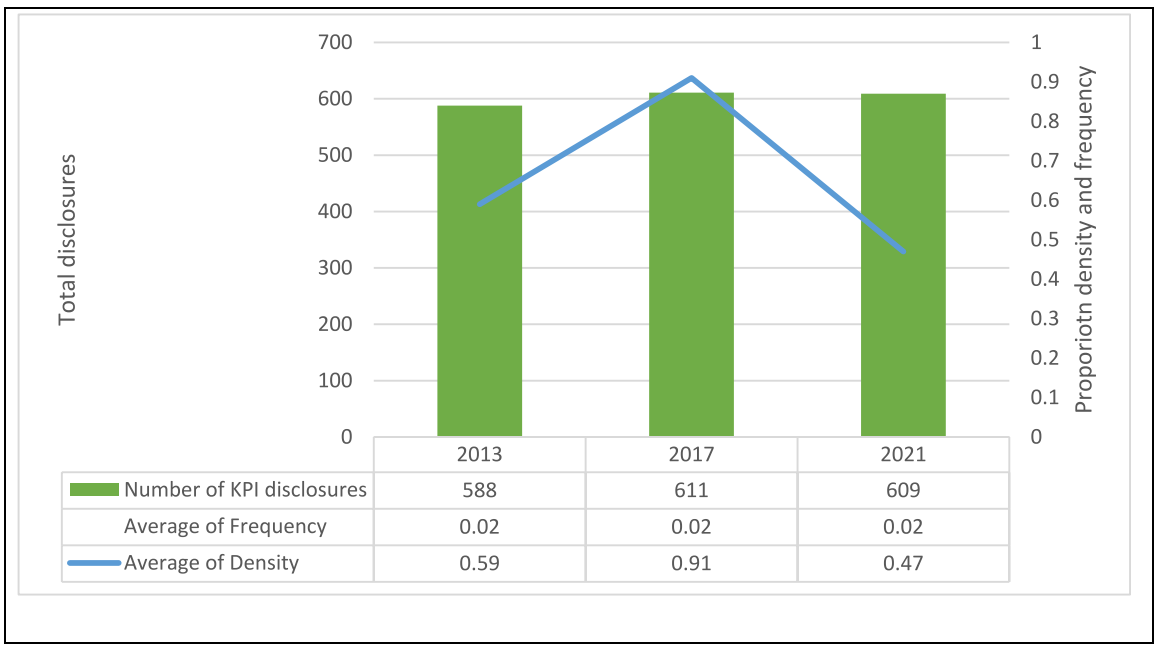

FIGURE 4 | Trends in KPI disclosures.

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the NRFD, this may also contribute to other jurisdictions following best practices (Baboukardos et al. 2021; Farooq et al. 2024).

4.1.2 | Timeframe

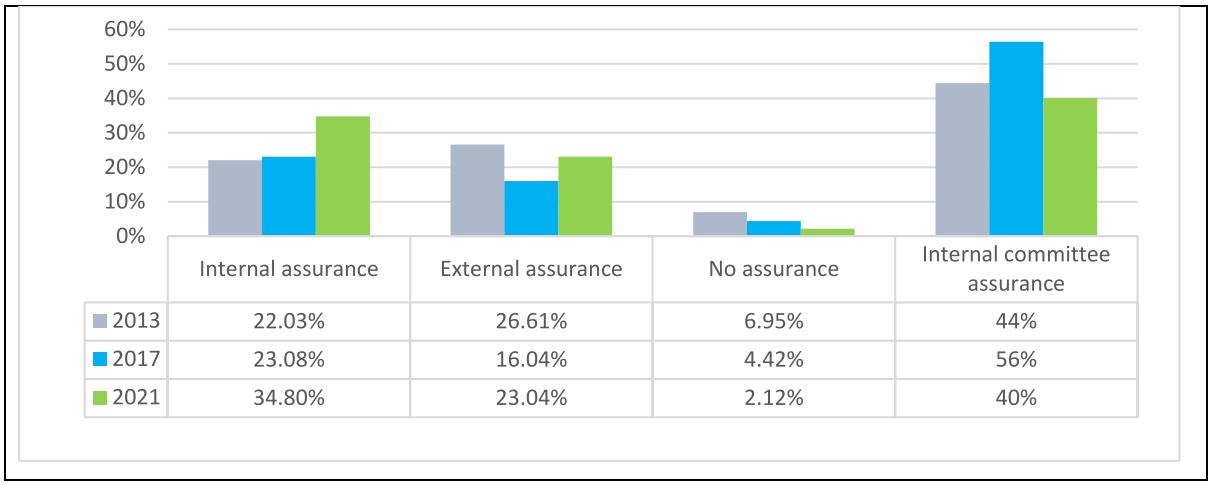
Figure 6 illustrates the distribution of KPIs set over the short-, medium-, and long-term. Short-term KPIs relate to targets achieved within a year, medium-term KPIs set targets between 1 and 5 years, and long-term KPIs are targets set for longer than 5 years.

In 2013, almost all KPIs were short-term focused (Total = 564 KPIs; 96%). This coincides with the financial-centric focus prevailing at that time (Solomon 2013). A slight shift away from a short-term focus is noted in 2017; however, significant steps were not yet evidenced to develop a multi-timeframe horizon (Total = 574 KPIs; 94%). By 2021, the proportion of KPIs focused on the short-term decreases from 96% to 82% (Total = 499 KPIs) with 14% medium-term targets (Total = 85 KPIs) and 4% long-term targets (Total = 24 KPIs). This is an increase from only 4% (Total = 23 KPIs) of KPIs focusing on medium-term targets in 2013 and no long-term targets set. The trend suggests that KPIs are being increasingly used to promote long-term value creation.

4.1.3 | Coverage of SDGs and Multi-Capitals

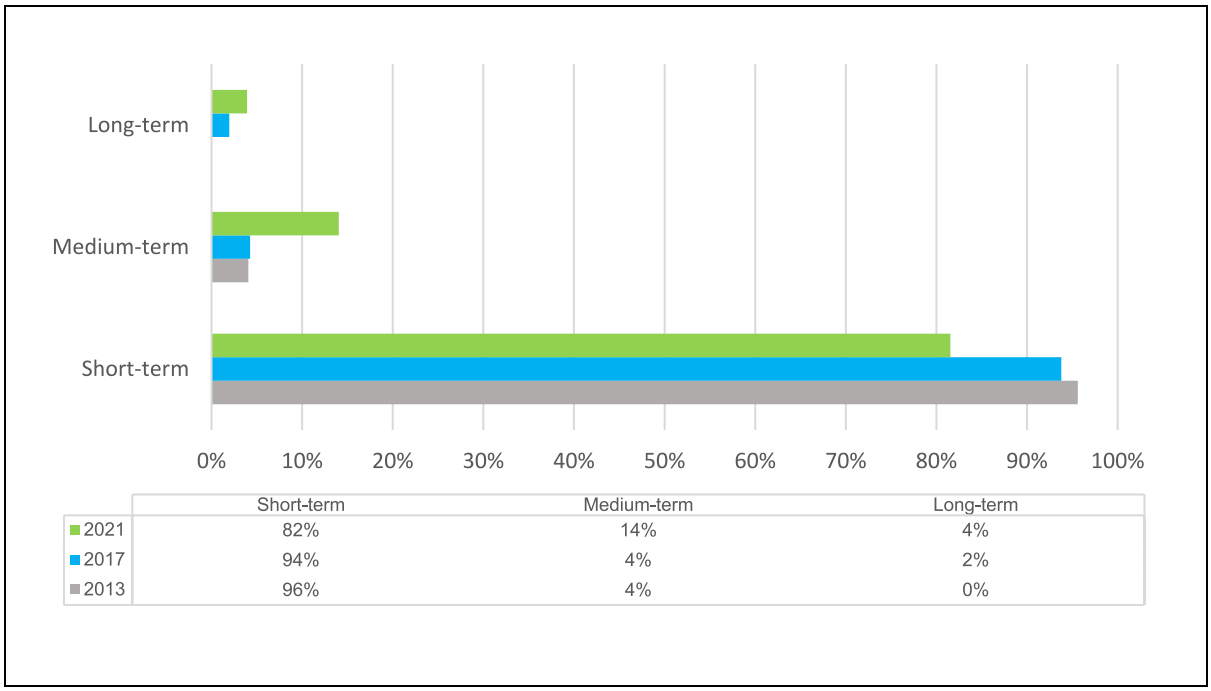
Figure 7 deals with the coverage of SGDs and multi-capitals.

Financial capital was the focal area in 2013 (Total = 339 KPIs; 58%) and 2017 (Total = 347 KPIs; 57%). By 2021, there is a notable shift away from KPIs linked only to financial outcomes (Total = 228 KPIs; 38%). This may reflect increased



	Internal assurance	External assurance	No assurance	Internal committee assurance
2013	22.03%	26.61%	6.95%	44%
2017	23.08%	16.04%	4.42%	56%
2021	34.80%	23.04%	2.12%	40%

FIGURE 5 | Levels of assurance obtained over KPIs.



	Short-term	Medium-term	Long-term
2021	82%	14%	4%
2017	94%	4%	2%
2013	96%	4%	0%

FIGURE 6 | Timeframes covered by KPIs.

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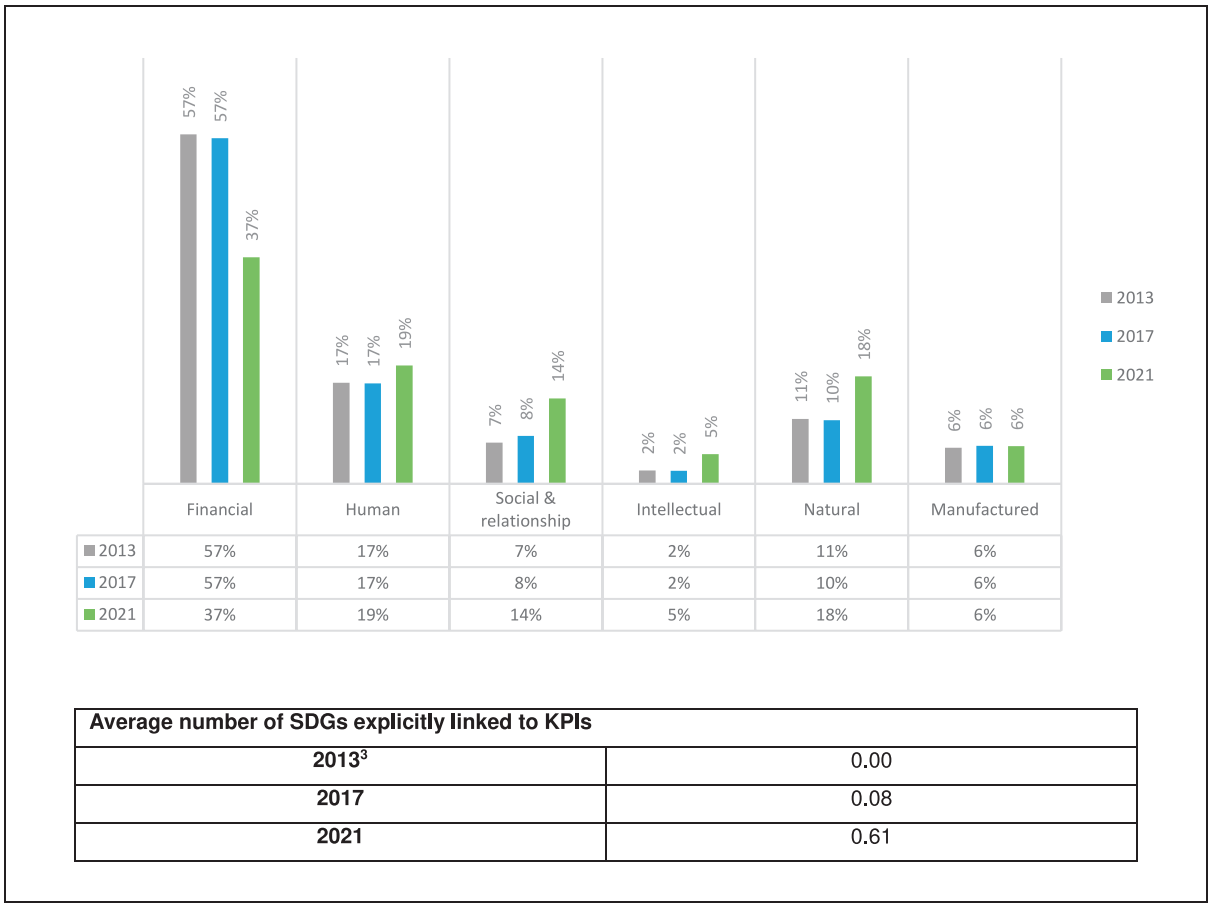

	Financial	Human	Social & relationship	Intellectual	Natural	Manufactured
2013	57%	17%	7%	2%	11%	6%
2017	57%	17%	8%	2%	10%	6%
2021	37%	19%	14%	5%	18%	6%

Average number of SDGs explicitly linked to KPIs	
2013[3]	0.00
2017	0.08
2021	0.61

FIGURE 7 | Coverage of SDGs and multi-capitals in KPI disclosures.[3]

stakeholder pressure to acknowledge the other capitals and a growing appreciation of the business case to do so (Herath et al. 2021). Financial capital will still form a significant part of performance metrics for profit-driven companies, but an underlying multi-capital logic highlighted by Figure 6 is consistent with earlier research pointing to integrated thinking gaining traction among South African entities (Ecim and Maroun 2024). This is particularly evident as KPIs linked to human (2021 = 119 KPIs; 19%), social and relationship (2021 = 86 KPIs; 14%) and natural (2021 = 108 KPIs; 18%) capital gained prominence. This illustrates an integrated strategy toward performance evaluation that incorporates aspects such as human welfare, community projects and biodiversity targets.

The number of SDGs explicitly linked to KPIs has increased over time. By 2021, almost 1 SDG (0.61) was being explicitly linked to performance evaluation. The fact that more SDGs are not being covered may be due to the difficulty of incorporating supranational objectives into company-level performance indicators.

4.1.4 | Stakeholder Engagement

The level of stakeholder engagement exercised in the KPI determination process is shown in Figure 8. This is evidenced if there is an explicit statement of stakeholder engagement on both the remuneration policy and the issue that the KPI seeks to address.

Stakeholder engagement on the specific issues addressed by the KPI has decreased (2013 = 576 KPIs; 97.97%; 2021 = 409 KPIs; 67.16%). Lower levels of stakeholder engagement may coincide with COVID-19 having an adverse effect on firm performance and governing bodies being reluctant to communicate this widely. Equally possible is information overload. As key stakeholders are bombarded with ever more detail, companies may be scaling back on direct stakeholder engagement and refining materiality determination processes (Lai et al. 2017).

4.1.5 | Post-Implementation Reviews

Figure 9 shows that the level of post-implementation reviews has increased from 2013 (Total = 382 KPIs; 65%) to 2021 (Total = 499 KPIs; 82%). This is evidenced by way of an explicit statement that post-implementation reviews or feedback loops are implemented.

Organisations are increasingly assessing KPIs for alignment with strategic objectives, risks and opportunities in terms of both a financial and extra-financial context. A feedback loop is taking hold that ensures outcomes are being achieved and corrective action is being taken.

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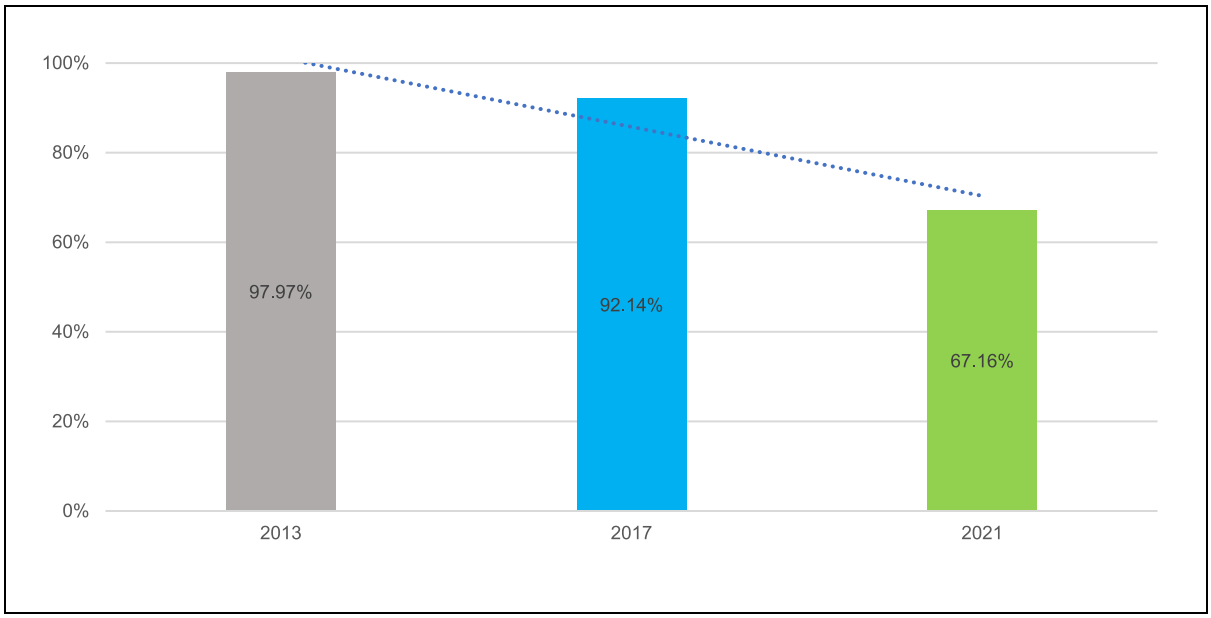

FIGURE 8 | Level of stakeholder engagement.

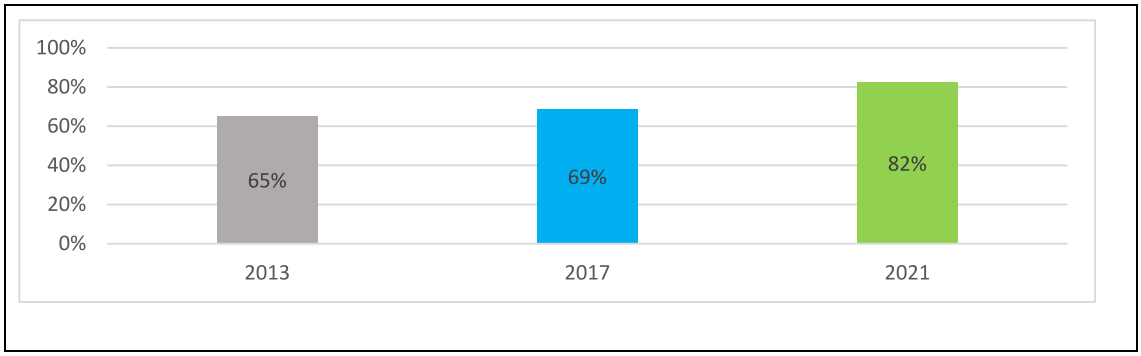

FIGURE 9 | Post-implementation review.

4.1.6 | Factors Influencing Achievement, Materiality and Level of Application

Materiality disclosures, the factors influencing the achievement of the KPI and the level of application have remained consistent from 2013 to 2021. Most organisations continue to base KPIs on internal factors which are within the control of management, disclose how they determine material KPIs and set KPIs, which cover company objectives aligned with the business model including those of executives. Refer to Table 5.

TABLE 5 | Themes appropriately applied to KPI disclosures.

	2013	2017	2021
Factors influencing achievement			
External influences	8.14%	9.82%	9.97%
Internal influences	91.53%	91.16%	97.55%
Materiality	95.25%	99.02%	99.51%
Level of application of KPI			
Staff	0%	0%	0%
Executives	2.1%	2.43%	5.37%
Company objectives	100%	100%	100%

4.2 | KPI Disclosures by Industry and Size

To provide further insights, the frequency of the integrated thinking principles per KPI disclosure is analyzed according to the industry and size of the organisations.

As per Figure 10, the public administration ($\overline{X} = 5.05$) and services ($\overline{X} = 5.58$) sectors exhibited the lowest integration of KPI principles with KPI disclosures. Complex structures and departmental fragmentation within public administration often result in isolated reporting, with departments prioritising their financial KPIs over broader implications (Tirado-Valencia et al. 2020). Other than the services and retail trade industries, all other industries have improved over time.

Companies in the manufacturing ($\overline{X} = 6.38$) and mining ($\overline{X} = 6.14$) sectors show the highest integration of KPI principles

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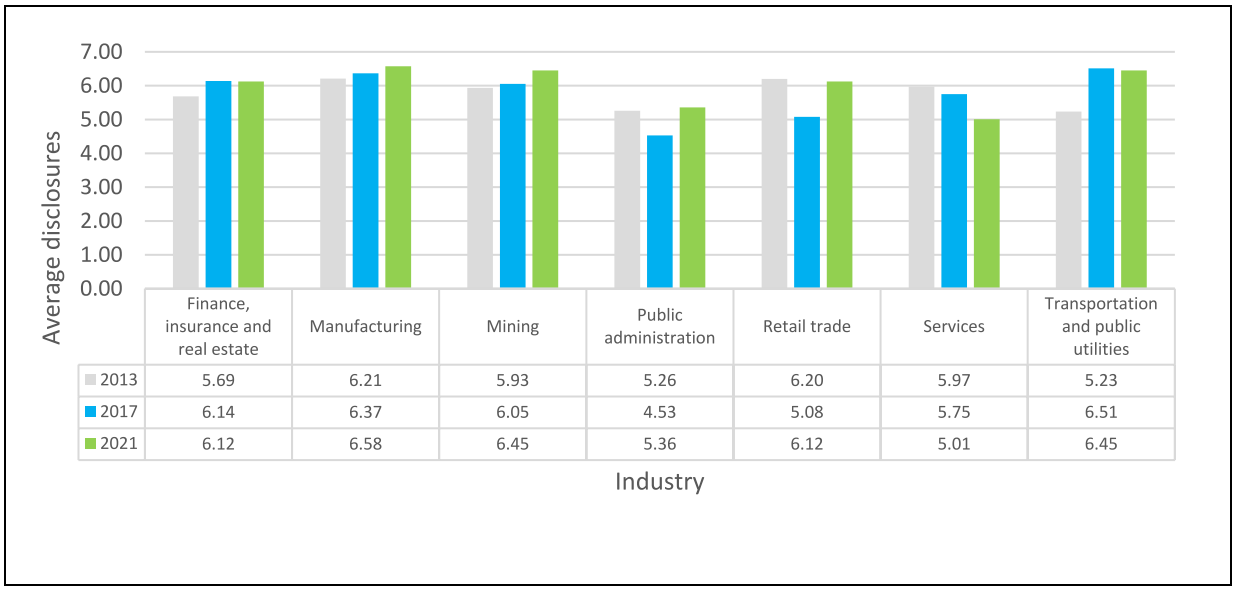
with KPI disclosures. Manufacturing and mining companies face intricate, multi-stakeholder supply chains and impacts on natural resources, necessitating integrated strategies to optimise the value chain holistically, including ESG considerations (Michelon et al. 2015). Reporting on resource conservation becomes a significant concern for these companies, potentially prompting increased inclusion of natural capital in performance assessments (Maroun and Ecim 2024). Integrated thinking enables sustainable product design, life cycle considerations and differentiation through environmental and social responsibility while promoting quality. This is integrated and reflected in how the organisation structures its KPIs.

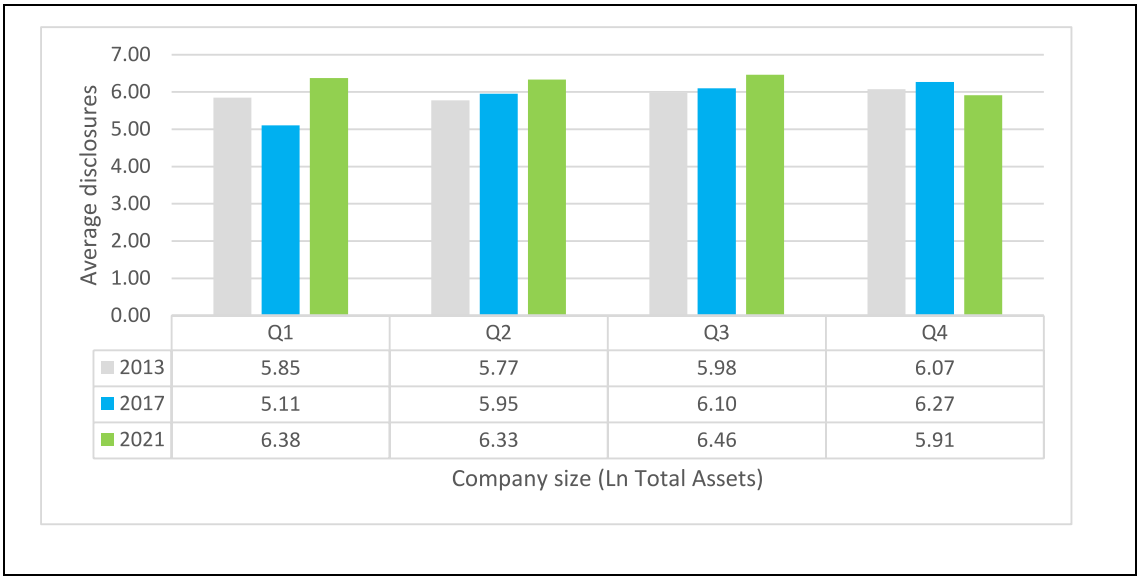
Figure 11 shows how the KPI disclosures have changed over time based on companies of different sizes. The companies were stratified into quartiles based on their log of total assets, with the first quartile (Q1) representing the smallest companies and the last quartile (Q4) representing the largest companies in the sample.

In 2013 (Q4 = 6.07) and 2017 (Q4 = 6.27), the largest companies in the sample had the highest integration of integrated thinking principles with KPI disclosures. This may have been because the larger entities have sufficient financial resources to implement policies and procedures to oversee the KPI determination process. These entities were able to react to changes in sustainability requirements more quickly and implement policies to incorporate these considerations into performance evaluation structures. This is supported by a robust management information system to track material issues and progress toward the achievement of their objectives, as well as by enhanced stakeholder engagement.



	Finance, insurance and real estate	Manufacturing	Mining	Public administration	Retail trade	Services	Transportation and public utilities
2013	5.69	6.21	5.93	5.26	6.20	5.97	5.23
2017	6.14	6.37	6.05	4.53	5.08	5.75	6.51
2021	6.12	6.58	6.45	5.36	6.12	5.01	6.45

FIGURE 10 | KPI-ITI over time per industry.



	Q1	Q2	Q3	Q4
2013	5.85	5.77	5.98	6.07
2017	5.11	5.95	6.10	6.27
2021	6.38	6.33	6.46	5.91

FIGURE 11 | KPI-ITI over time per company size.

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However, by 2021, the KPI-ITI of the largest organisations in the sample had declined (Q4 = 5.91). Organisations in Q1–Q3 had overtaken the Q4 organisations and shown significant progress in adopting KPIs that included a higher frequency of integrated thinking principles. As organisations begin to understand and incorporate integrated thinking in operations and strategies, this can be included in performance evaluation structures. Given the growing sustainability agenda, particularly from 2017, many organisations may have taken to mimetic isomorphism to adopt the disclosed structures and policies of larger organisations. These could then be more easily adapted to smaller stakeholder groups and simpler business models to achieve a performance evaluation structure that is more aligned with integrated thinking principles.

5 | Conclusion

Traditionally, KPIs have focused exclusively on financial dimensions, but both practitioners and academics acknowledge the importance of complementing these with extra-financial factors in keeping with a commitment to integrated thinking (Dissanayake 2021; Maroun et al. 2023; Neri et al. 2021; Rahman et al. 2022). This paper contributes to the performance evaluation landscape by synthesising the literature dealing with integrated thinking and using this to develop a schematic for gauging how integrated thinking is incorporated into organisations' KPIs. The instrument is applied to a sample of South African companies to provide a sense of how KPIs are incorporating financial and extra-financial factors and to identify examples of best and worst practices.

From a theoretical perspective, emerging economies such as India, Indonesia, Malaysia, South Africa and Russia have significantly contributed to the advancement of KPI research. These countries are using KPIs to advance sustainable economic growth and to promote transparent corporate governance (Herbert and Graham 2021). This is crucial for attracting much-needed international investment and bolstering the legitimacy of local capital markets. Developed nations have prioritised the modification of performance metrics to tackle emerging challenges, including digital transformation (Caputo et al. 2021) and strategic goal-setting concerns in relation to the business model (Gutmayer et al. 2022; Sukhari and De Villiers 2019). The significance of technology and data analytics in KPI research has been highlighted, particularly in addressing the difficulties presented by the COVID-19 pandemic (Atkins et al. 2020; Rahman et al. 2022).

From a practical perspective, South African companies show an increased adoption of the integrated thinking principles incorporated into their KPIs. This resonates with the broad objectives of sustainability-related frameworks and guidelines such as those by the ISSB, GRI and EU to prioritise sustainability and long-term value creation. The current paper's findings also respond to calls for additional research on how performance management systems can be used to advance an integrated thinking logic (Maroun et al. 2023). The eight principles of integrated thinking provide stakeholders with a useful benchmark against which to gauge how effectively an organisation incorporates financial and extra-financial matters in its performance structures. Similarly, management can use the eight principles to identify areas requiring remedial action.

The empirical evidence shows that organisations will need to focus on improving management information systems to collect, analyse and report on extra-financial information. In addition to improving internal decision-making, this can be used to enable third-party assurance of KPI-related disclosures for the benefit of investors and other stakeholders. Given that the assurance of extra-financial information is growing, providing assurance over both financial and extra-financial KPIs will provide stakeholders with the requisite confidence that the KPIs are valid, accurate and complete (Farooq et al. 2024). At the same time, although there has been progress made on integrating different capitals and timeframes into KPIs, more can be done to incorporate long-term objectives as well as metrics focused on natural, social and relationship and human capital. Stakeholder engagement can also be improved.

Policy-makers and regulators may be able to use the principles of integrated thinking to identify areas within sustainability-related frameworks and guidelines that require refinement to align with corporate practices. Assurance providers may also find the principles useful to help support risk assessments related to performance evaluation, support data-driven decisions and evaluate the underlying management information systems.

The current paper provides a useful reference for academics by outlining the current jurisdictional focus, research epistemologies and the methods being adopted. The principles of integrated thinking developed and illustrated by this research can be refined further and used to examine the quality and level of reporting on KPIs and how this correlates with the adoption of an integrated thinking logic. Much of the existing research deals with developed economies. While there have been some efforts to study KPIs in emerging economies, only certain jurisdictions have been covered. Future research can focus on how KPIs are understood, implemented and reported on in key jurisdictions in Africa, Asia and South America. It would also be useful to consider cross-regional similarities and differences. For example, the type of KPIs being selected and the manner in which they are applied may vary because of social, cultural and political factors that remain unexamined.

The current paper makes some ground in contributing to the limited research on KPIs but is limited to a single African economy. In addition, the results are based on a relatively small sample of listed companies over a select period. The determinants and consequences of KPI reporting are not tested. Further research can build on this paper's findings by conducting a more extensive longitudinal analysis of how KPI development and reporting are changing over time. This line of testing can be expanded to cover multiple economies and different types of entities including, for example, those in the public or not-for-profit sector (Adams and Simnett 2011). Understanding the impact of the EU's regulations on sustainability-related matters and how this is incorporated into performance evaluation metrics, strategies and reviews will offer unique insights that can be applied to a broader audience. In addition, applying the indicators of integrated thinking in the context of the KPIs of sustainability-related matters such as those propagated by the ISSB, GRI or

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the EU CSRD will provide insights into how performance evaluation can be used to drive the sustainability agenda. This includes expanding the study to different types of extra-financial reports.

A richer set of findings can also be generated using a more refined measure of KPI disclosures. This paper deals only with the frequencies of disclosures organised by themes. Examples of best and worst practices were identified using the researchers' judgment. A more formal measure of the quality of KPI disclosures would be useful. The facts and circumstances that contribute to better or worse quality reporting would link the KPI research to the broader sustainability literature and provide important insights for both academics and practitioners.

Acknowledgements

The authors would like to thank Lelys Maddock for her editorial services.

Endnotes

[1] BRICS is an intergovernmental organisation consisting of emerging economies such as Brazil, Russia, India, China and South Africa among other nations.

[2] Different types of reports deal with extra-financial information and have different naming conventions depending on the jurisdiction. Examples include corporate reports, integrated reports, sustainability reports and corporate social responsibility reports. For the purposes of this paper, the report, which deals with non-financial reporting with a multi-capital perspective and value generation for a broader stakeholder group will be referred to collectively as 'extra-financial reports'.

[3] Results for 2013 illustrate the number of Millenium Development Goals (MDGs) linked to KPIs. MDGs are the predecessor of SDGs.

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Appendix A

Disclosure Examples of Best and Worst Practices of Incorporating Integrated Thinking Principles in KPIs

Examples of how organisations have illustrated the application of integrated thinking principles in setting, evaluating, and disclosing KPIs have been illustrated below. A summary of the key findings is included in Table A1.

Instances of best and worst practice disclosures per theme are reported below.

Assurance

Figure A1 shows the inclusion of types of assurance obtained over each KPI disclosed. The organisation uses external assurance, management and board monitoring and independent surveys. This is referred to as combined assurance and supports the performance evaluation structure.

Timeframe

Figure A2 is an extract of KPI disclosures, including the timeframe within which the KPI is intended to be achieved. The disclosure shows a mixture of medium- (2022–2026) and long-term (post-2026) KPIs being reported. Short-term KPIs were disclosed but are not included for stylistic purposes.

Defining the timeframes of KPIs enables stakeholders to better understand the alignment between KPIs and a company's strategic goals (IIRC 2021). For example, a reduction in energy consumption is the primary goal. This is linked to seven measurable targets. The company has also reported the corresponding SDGs and the timeframe for achieving each.

Number of SDGs and Multi-Capitals Addressed

Figure A3 also illustrates how SDGs can be explicitly linked to KPI disclosures. Despite SDGs being set at a supranational level, some companies can measure their contribution toward achieving these goals (Adams et al. 2020). This highlights the application of an integrated thinking logic, as performance evaluation structures are formulated with a multifaceted outlook incorporating broader objectives.

Similarly, including different types of capitals in KPIs demonstrates a holistic approach to sustainability reporting (Herath et al. 2021). This acknowledges that a company's actions have various impacts on society and the environment while highlighting the interconnectedness between financial and non-financial considerations. Figure A4 illustrates a set of KPIs that address different outcomes categorised by capital (natural, human, social and manufactured capitals).

Some organisations have not made a holistic approach to their KPI structures, maintaining a financial-centric agenda. Figure A5 provides an example. This organisation disclosed only financial KPIs. This narrow scope fails to consider social and environmental issues that are relevant for ensuring long-term sustainability. Overreliance on financial metrics may lead to management prioritising short-term economic objectives to the detriment of the long-term credibility and viability of the organisation (Herath et al. 2021).

Factors Influencing the Achievement of KPI

Most companies' KPIs are based on internal factors because these can be controlled by management and, therefore, provide a reasonable basis for determining their compensation. Some organisations, however, also include external performance indicators. Most common is the share price. Refer to Figure A6.

The first four KPIs are used to assess the company's operational efficiencies and performance. While share prices will be driven by an organisation's internal dynamics, market valuations will incorporate a host of factors over which management has little control. As a result, there may be a disconnect between management conduct and how well a company performs, gauged according to changes in its market capitalisation.

Stakeholder Engagement

Companies should disclose their efforts to engage with stakeholders (Rinaldi 2020). This can include, for example, the needs, expectations and concerns of stakeholders that must be assessed and linked to how value is created for the different groups. Thereafter, the related KPI and material issues can be determined and must be facilitated by way of continuous and transparent communication. Refer to Figure A7.

Materiality

Materiality is not often disclosed specifically for performance evaluation and is limited to the core themes, capitals, stakeholders, risks and operations, which then indirectly filter into the metrics set. Organisations can more efficiently manage their performance and allocate resources by concentrating on the KPIs that are most relevant for driving value generation. At the same time, investors and stakeholders can more easily compare a company's performance to its peers and industry benchmarks when material KPIs are disclosed.

Post-Implementation Review

Figure A8 details a post-implementation review performed over a company's 2021 KPIs. The COVID-19 pandemic had a material effect on performance evaluation outcomes. As a result, the company used 2019 rather than 2020 as the base year for assessing targets. This demonstrates pragmatism. The company is not treating the post-implementation review as a procedural exercise. It is purposefully changing its comparative year to generate meaningful variances that can inform appropriate remedial action.

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TABLE A1 | Disclosure summary of best and worst practices.

Theme	Best practice	Worst practice
Assurance	• Matching the levels of assurance with the rank of importance of the KPIs • Clear articulation of roles of different assurance providers in the combined assurance model • Disclosing the process for selecting and approving KPIs, emphasising alignment with strategic objectives • Illustration of how insights gained from KPI outcomes can impact operations and strategic direction	• Low levels of assurance for highly important KPIs • Vague disclosures/inconsistencies in combined assurance components • Boilerplate disclosure on combined assurance obtained/assurance procedures not disclosed • Failure to engage stakeholders during the KPI selection/approval process • Ignoring deviations from targets without further explanation/corrective action
Timeframe	• Definition of what is considered short-, medium- and long-term is provided • Clear articulation of how medium-term KPIs bridge the gap between short-term actions and long-term objectives • Rationale explained for selecting long-term KPIs emphasising their strategic performance • Appropriate balance among all three timeframes	• Over-emphasis on short-term goals/lack of medium- and long-term focus • Lack of clarity on what each timeframe represents • Long-term KPIs are unattainable/unrealistic
Coverage of SDGs and multi-capitals	• KPI-SDG links are provided on an individual KPI basis • Alignment of KPI-SDG links with strategic objectives • Coverage of multiple SDGs • All capitals addressed by KPIs • Distinct link between each capital and each KPI • Description of how the company manages each capital, illustrating relevance of KPIs	• Focus on limited SDGs • Failure to quantify efforts of KPIs on SDGs, leaving impact open to interpretation • KPI-SDG links detached from broader strategic objectives/business model • Majority financially focused KPIs • Isolated capital considerations/no acknowledgement of interdependencies of capitals • Dominance of short-term KPIs on financial capital & neglect of other capitals for long-term considerations
Factors influencing achievement of KPI	• Description of actions implemented to mitigate impact of external factors on KPIs • Acknowledgement of how internal/external factors impact the entity's ability to achieve KPIs	• KPIs linked to market sentiment/share price/market share • Ignoring historical context/trends related to internal/external factors impact KPIs
Stakeholder engagement	• Statement on methods used and frequency of engagement • Inclusion of various stakeholder groups • Demonstration of how stakeholder feedback has influenced KPI selection • Communication of outcomes from stakeholder engagement	• Shareholder-centric focus/no stakeholder engagement • Failure to demonstrate tangible actions based on stakeholder feedback • Neglecting to address disagreements/concerns raised by stakeholders
Materiality	• Transparent description of the process used to determine materiality • Stakeholder engagement conducted in the materiality determination process • Consideration of strategic priorities in materiality determination	• Blanket statement on materiality for all items in the integrated report • No information was provided on how materiality is determined • Overlooking feedback from stakeholders on matters that are most material to them
Level of application of KPI	• Alignment of companywide KPIs with executive KPIs • Explanation of interconnections between KPIs set at various organisational levels	• Executive KPIs misaligned with companywide KPIs • No link provided for companywide and staff-level KPIs (lack of goal congruence)
Post-implementation review	• Detailed discussion on events impacting the relevance/achievement of KPIs • Explanation of recommendations and subsequent adjustments made to KPIs • Inclusion of stakeholders in the review • Comparative information provided for multiple years • Progress indicator that clearly illustrates whether progress has been made/declined • Performance compared against industry benchmarks	• Omission of discussion on actions taken based on review findings • Shallow/vague review of KPIs • Failure to articulate criteria for evaluating appropriateness and progress of KPIs • No analysis of what the data signifies and whether progress has been made or not • Comparative information provided without historical context • Only internal comparative information provided; no reference is made to industry benchmarks

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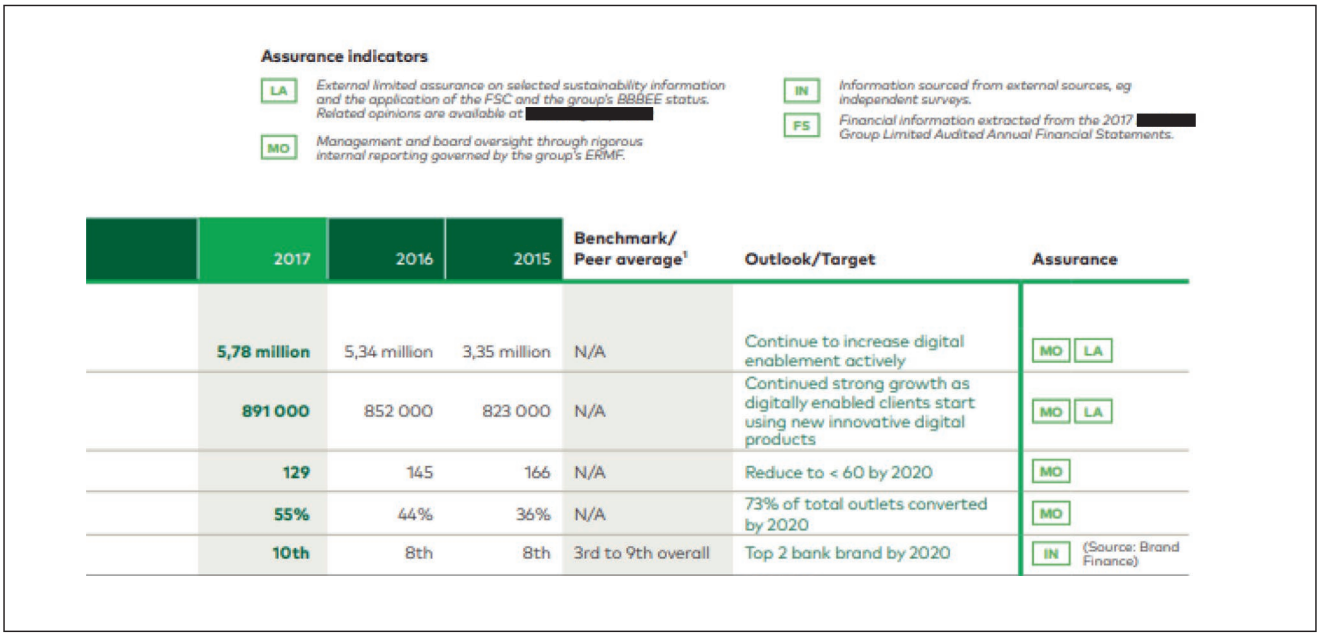

Assurance indicators

LA — *External limited assurance on selected sustainability information and the application of the FSC and the group's BBBEE status. Related opinions are available at* [redacted]

MO — *Management and board oversight through rigorous internal reporting governed by the group's ERMF.*

IN — *Information sourced from external sources, eg independent surveys.*

FS — *Financial information extracted from the 2017* [redacted] *Group Limited Audited Annual Financial Statements.*

	2017	2016	2015	Benchmark/ Peer average[1]	Outlook/Target	Assurance
	5,78 million	5,34 million	3,35 million	N/A	Continue to increase digital enablement actively	MO LA
	891 000	852 000	823 000	N/A	Continued strong growth as digitally enabled clients start using new innovative digital products	MO LA
	129	145	166	N/A	Reduce to < 60 by 2020	MO
	55%	44%	36%	N/A	73% of total outlets converted by 2020	MO
	10th	8th	8th	3rd to 9th overall	Top 2 bank brand by 2020	IN (Source: Brand Finance)

FIGURE A1 | Best practice of assurance in KPI disclosure. *Source:* Company 20.

Goals	Targets	UN SDGs	Year	KPIs
Reduce primary energy consumption, greenhouse gas emissions, potable water demand, non-recycled waste generation, and pollution	Increase energy efficiency by 20%	12, 13	2024	% MWh LFL % energy intensity LFL
	Assets to produce renewable energy for own consumption	7, 13	2030	on-site renewable production capacity
	Reach a waste recycling rate of 60% from operations	11	2025	waste recycled/total % % of recycled waste per m^2 % of recycled waste per visitor
	Achieve zero waste to landfill from operations	11	2025	waste to landfill
	Decrease potable water consumption by 15%	6	2024	% water consumption LFL % water intensity LFL
	Reduce emissions from operations by 70%	13	2030	operations carbon footprint
	Reduce embodied emissions from new constructions by 30%	13	2030	construction carbon footprint

FIGURE A2 | Best practice of timeframe disclosure. *Source:* Company 5.

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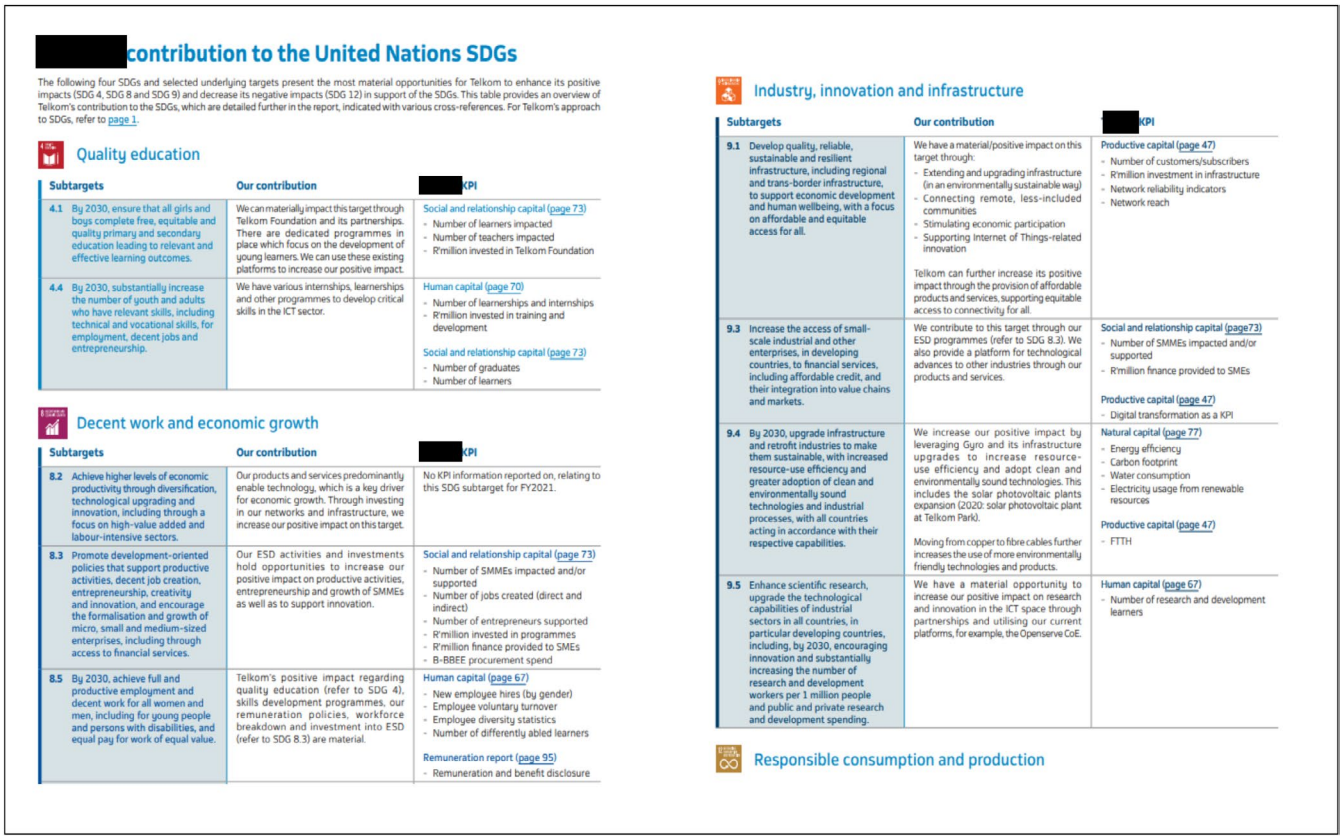

[redacted] contribution to the United Nations SDGs

The following four SDGs and selected underlying targets present the most material opportunities for Telkom to enhance its positive impacts (SDG 4, SDG 8 and SDG 9) and decrease its negative impacts (SDG 12) in support of the SDGs. This table provides an overview of Telkom's contribution to the SDGs, which are detailed further in the report, indicated with various cross-references. For Telkom's approach to SDGs, refer to page 1.

Quality education

Subtargets	Our contribution	[redacted] KPI
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.	We can materially impact this target through Telkom Foundation and its partnerships. There are dedicated programmes in place which focus on the development of young learners. We can use these existing platforms to increase our positive impact.	Social and relationship capital (page 73) - Number of learners impacted - Number of teachers impacted - R'million invested in Telkom Foundation
4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.	We have various internships, learnerships and other programmes to develop critical skills in the ICT sector.	Human capital (page 70) - Number of learnerships and internships - R'million invested in training and development Social and relationship capital (page 73) - Number of graduates - Number of learners

Decent work and economic growth

Subtargets	Our contribution	[redacted] KPI
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.	Our products and services predominantly enable technology, which is a key driver for economic growth. Through investing in our networks and infrastructure, we increase our positive impact on this target.	No KPI information reported on, relating to this SDG subtarget for FY2021.
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro, small and medium-sized enterprises, including through access to financial services.	Our ESD activities and investments hold opportunities to increase our positive impact on productive activities, entrepreneurship and growth of SMMEs as well as to support innovation.	Social and relationship capital (page 73) - Number of SMMEs impacted and/or supported - Number of jobs created (direct and indirect) - Number of entrepreneurs supported - R'million invested in programmes - R'million finance provided to SMEs - B-BBEE procurement spend
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.	Telkom's positive impact regarding quality education (refer to SDG 4), skills development programmes, our remuneration policies, workforce breakdown and investment into ESD (refer to SDG 8.3) are material.	Human capital (page 67) - New employee hires (by gender) - Employee voluntary turnover - Employee diversity statistics - Number of differently abled learners Remuneration report (page 95) - Remuneration and benefit disclosure

Industry, innovation and infrastructure

Subtargets	Our contribution	[redacted] KPI
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all.	We have a material/positive impact on this target through: - Extending and upgrading infrastructure (in an environmentally sustainable way) - Connecting remote, less-included communities - Stimulating economic participation - Supporting Internet of Things-related innovation Telkom can further increase its positive impact through the provision of affordable products and services, supporting equitable access to connectivity for all.	Productive capital (page 47) - Number of customers/subscribers - R'million investment in infrastructure - Network reliability indicators - Network reach
9.3 Increase the access of small-scale industrial and other enterprises, in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.	We contribute to this target through our ESD programmes (refer to SDG 8.3). We also provide a platform for technological advances to other industries through our products and services.	Social and relationship capital (page73) - Number of SMMEs impacted and/or supported - R'million finance provided to SMEs Productive capital (page 47) - Digital transformation as a KPI
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries acting in accordance with their respective capabilities.	We increase our positive impact by leveraging Gyro and its infrastructure upgrades to increase resource-use efficiency and adopt clean and environmentally sound technologies. This includes the solar photovoltaic plants expansion (2020: solar photovoltaic plant at Telkom Park). Moving from copper to fibre cables further increases the use of more environmentally friendly technologies and products.	Natural capital (page 77) - Energy efficiency - Carbon footprint - Water consumption - Electricity usage from renewable resources Productive capital (page 47) - FTTH
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.	We have a material opportunity to increase our positive impact on research and innovation in the ICT space through partnerships and utilising our current platforms, for example, the Openserve CoE.	Human capital (page 67) - Number of research and development learners

Responsible consumption and production

FIGURE A3 | Best practice of KPI linkage to SDGs. *Source:* Company 37.

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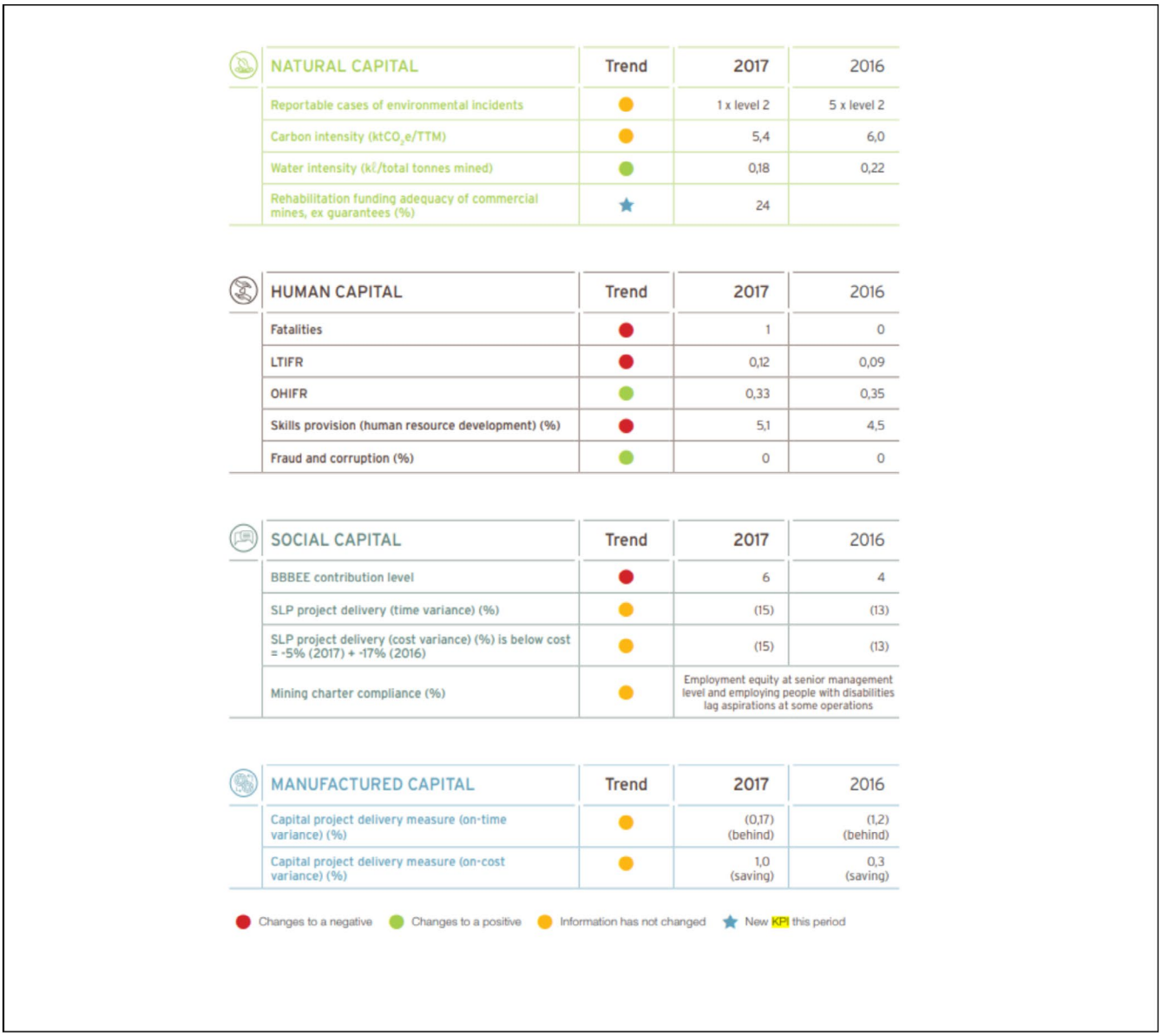

NATURAL CAPITAL	Trend	2017	2016
Reportable cases of environmental incidents	●	1 x level 2	5 x level 2
Carbon intensity ($ktCO_2e$/TTM)	●	5,4	6,0
Water intensity (kℓ/total tonnes mined)	●	0,18	0,22
Rehabilitation funding adequacy of commercial mines, ex guarantees (%)	★	24	

HUMAN CAPITAL	Trend	2017	2016
Fatalities	●	1	0
LTIFR	●	0,12	0,09
OHIFR	●	0,33	0,35
Skills provision (human resource development) (%)	●	5,1	4,5
Fraud and corruption (%)	●	0	0

SOCIAL CAPITAL	Trend	2017	2016
BBBEE contribution level	●	6	4
SLP project delivery (time variance) (%)	●	(15)	(13)
SLP project delivery (cost variance) (%) is below cost = -5% (2017) + -17% (2016)	●	(15)	(13)
Mining charter compliance (%)	●	Employment equity at senior management level and employing people with disabilities lag aspirations at some operations	

MANUFACTURED CAPITAL	Trend	2017	2016
Capital project delivery measure (on-time variance) (%)	●	(0,17) (behind)	(1,2) (behind)
Capital project delivery measure (on-cost variance) (%)	●	1,0 (saving)	0,3 (saving)

● Changes to a negative ● Changes to a positive ● Information has not changed ★ New KPI this period

FIGURE A4 | Best practice of multi-capitals addressed. *Source:* Company 28.

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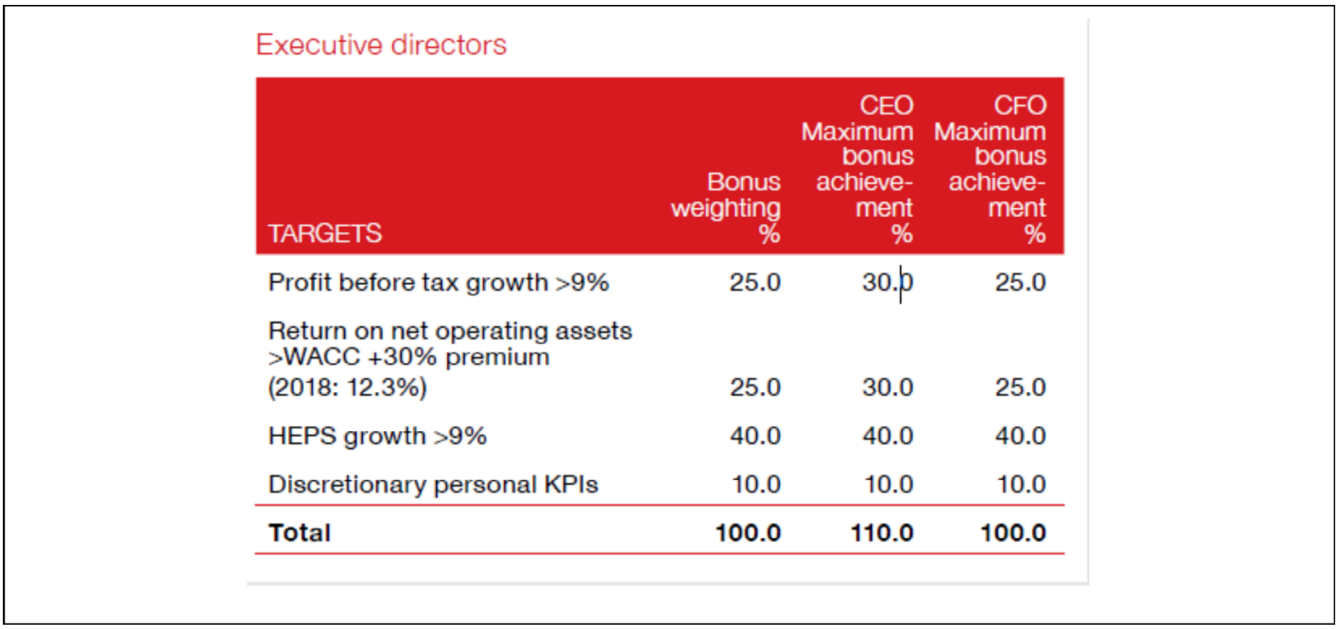
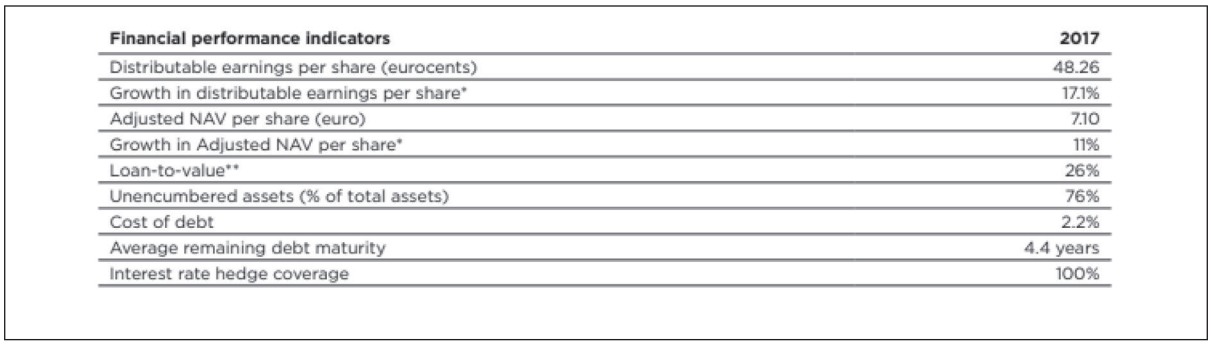


Executive directors

TARGETS	Bonus weighting %	CEO Maximum bonus achieve-ment %	CFO Maximum bonus achieve-ment %
Profit before tax growth >9%	25.0	30.0	25.0
Return on net operating assets >WACC +30% premium (2018: 12.3%)	25.0	30.0	25.0
HEPS growth >9%	40.0	40.0	40.0
Discretionary personal KPIs	10.0	10.0	10.0
Total	**100.0**	**110.0**	**100.0**

FIGURE A5 | Financially focused KPIs. *Source:* Company 9.



Financial performance indicators	2017
Distributable earnings per share (eurocents)	48.26
Growth in distributable earnings per share*	17.1%
Adjusted NAV per share (euro)	7.10
Growth in Adjusted NAV per share*	11%
Loan-to-value**	26%
Unencumbered assets (% of total assets)	76%
Cost of debt	2.2%
Average remaining debt maturity	4.4 years
Interest rate hedge coverage	100%

FIGURE A6 | Focus on external factors during the KPI setting process. *Source:* Company 14.

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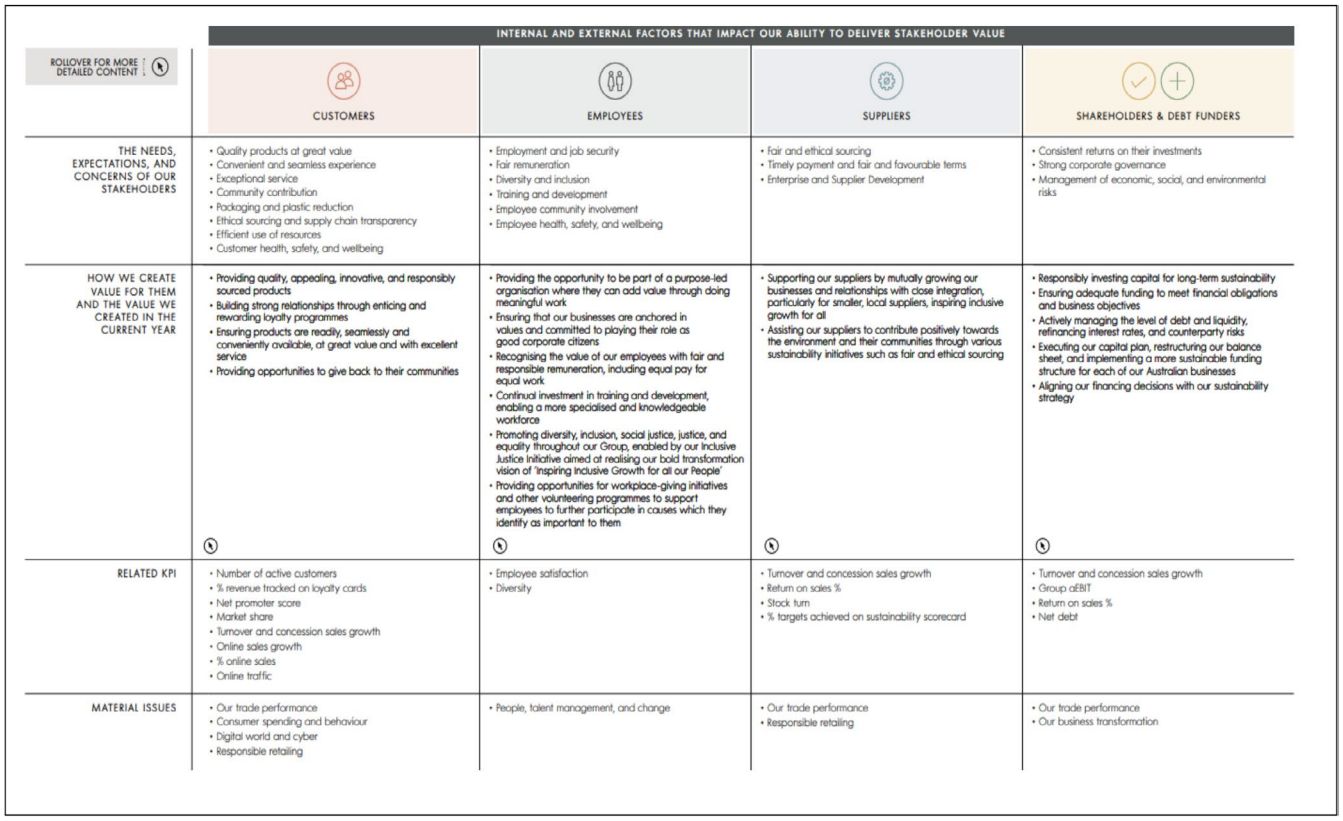

ROLLOVER FOR MORE DETAILED CONTENT	CUSTOMERS	EMPLOYEES	SUPPLIERS	SHAREHOLDERS & DEBT FUNDERS
	INTERNAL AND EXTERNAL FACTORS THAT IMPACT OUR ABILITY TO DELIVER STAKEHOLDER VALUE			
THE NEEDS, EXPECTATIONS, AND CONCERNS OF OUR STAKEHOLDERS	• Quality products at great value • Convenient and seamless experience • Exceptional service • Community contribution • Packaging and plastic reduction • Ethical sourcing and supply chain transparency • Efficient use of resources • Customer health, safety, and wellbeing	• Employment and job security • Fair remuneration • Diversity and inclusion • Training and development • Employee community involvement • Employee health, safety, and wellbeing	• Fair and ethical sourcing • Timely payment and fair and favourable terms • Enterprise and Supplier Development	• Consistent returns on their investments • Strong corporate governance • Management of economic, social, and environmental risks
HOW WE CREATE VALUE FOR THEM AND THE VALUE WE CREATED IN THE CURRENT YEAR	• Providing quality, appealing, innovative, and responsibly sourced products • Building strong relationships through enticing and rewarding loyalty programmes • Ensuring products are readily, seamlessly and conveniently available, at great value and with excellent service • Providing opportunities to give back to their communities	• Providing the opportunity to be part of a purpose-led organisation where they can add value through doing meaningful work • Ensuring that our businesses are anchored in values and committed to playing their role as good corporate citizens • Recognising the value of our employees with fair and responsible remuneration, including equal pay for equal work • Continual investment in training and development, enabling a more specialised and knowledgeable workforce • Promoting diversity, inclusion, social justice, justice, and equality throughout our Group, enabled by our Inclusive Justice Initiative aimed at realising our bold transformation vision of 'Inspiring Inclusive Growth for all our People' • Providing opportunities for workplace-giving initiatives and other volunteering programmes to support employees to further participate in causes which they identify as important to them	• Supporting our suppliers by mutually growing our businesses and relationships with close integration, particularly for smaller, local suppliers, inspiring inclusive growth for all • Assisting our suppliers to contribute positively towards the environment and their communities through various sustainability initiatives such as fair and ethical sourcing	• Responsibly investing capital for long-term sustainability • Ensuring adequate funding to meet financial obligations and business objectives • Actively managing the level of debt and liquidity, refinancing interest rates, and counterparty risks • Executing our capital plan, restructuring our balance sheet, and implementing a more sustainable funding structure for each of our Australian businesses • Aligning our financing decisions with our sustainability strategy
RELATED KPI	• Number of active customers • % revenue tracked on loyalty cards • Net promoter score • Market share • Turnover and concession sales growth • Online sales growth • % online sales • Online traffic	• Employee satisfaction • Diversity	• Turnover and concession sales growth • Return on sales % • Stock turn • % targets achieved on sustainability scorecard	• Turnover and concession sales growth • Group aEBIT • Return on sales % • Net debt
MATERIAL ISSUES	• Our trade performance • Consumer spending and behaviour • Digital world and cyber • Responsible retailing	• People, talent management, and change	• Our trade performance • Responsible retailing	• Our trade performance • Our business transformation

FIGURE A7 | Best practice of detailed stakeholder engagement matrix. *Source:* Company 40.

The Company established 2019 as baseline year for assessing the progress on the above targets. This was chosen as a representative year, before the Covid-19 pandemic impact tweaked some of the figures.

In 2021, the Group:

- scoped in and defined more precisely some targets, i.e., to cover either operations or development processes. As there are different material issues and a different approach in operating versus in developing a property, different targets need to be set up and different types of measures need to be implemented.
- revised the timeline and the ambition level for the targets maturing in 2022. Due to the Covid-19 pandemic and temporary reduction in operations (including restrictions on the operations of certain types of businesses), as well as decrease of the footfall in some periods, the Company cannot reliably separate the effects of these, from the resource consumption reduction based on the efficiency measures implemented. In this context, the Group decided to move the targets set for 2022 to 2024 or 2025, while at the same time revising the ambition level, in line with the sustainability strategy and industry.
- revised the ambition level for the long-term targets maturing in 2030, in line with best-in-class peers, while still reflecting the Group's context, markets, capabilities and portfolio. The long-term targets have been defined in 2020 to reflect the commitment to address climate change risks and opportunities. Starting 2021 [redacted] is also implementing a regular process of reassessment versus markets and internal progress, to ensure the targets remain relevant, achievable and sufficiently ambitious.

FIGURE A8 | Best practice of post-implementation review. *Source:* Company 11.

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