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博士論文（要約）

Corporate Environmental Sustainability (CES) in the retail sector:
The case of Japanese and South African supermarket companies

（小売業における環境サステナビリティ：日本と南アフリカのスーパーマーケットの事例研究）

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CORPORATE ENVIRONMENTAL SUSTAINABILITY (CES) IN THE RETAILSECTOR:
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ABSTRACT

Sustainable development and social responsibility have become increasingly important strategic issues for companies in virtually every industry. There is increased pressure for the adoption of Corporate Environmental Sustainability (CES) strategies to reduce the environmental impacts of the operations, products and services of private companies. However, literature on key issues related to the adoption and effectiveness of CES strategies in the retail sector is lacking.

Supermarkets, once thought to be accessible solely to middle- and upper-income consumers, have seized the opportunity presented by rapid urbanization, economic development and trade/market liberalization to expand in both developed and emerging economies. In many cases supermarkets have become the primary suppliers of food and general items direct to consumers. As supermarket companies account for a significant fraction of direct sales within the retail sector, they play a critical role in influencing consumers and suppliers to adopt environmentally friendly behavior.

Using a case study approach, this thesis identifies and explores the factors influencing the adoption, implementation and effectiveness of CES strategies in the supermarket sector in Japan and South Africa. The specific objectives are to (1) identify which CES strategies are preferred by supermarket companies in the two countries, and understand the drivers of CES adoption; (2) identify the methods and guidelines used to assess and document CES implementation progress, (3) understand the sustainability impacts and challenges of CES implementation, and (4) understand the visibility, awareness and acceptance of CES to consumers.

Initially an extensive literature review was conducted to situate this thesis in the context of existing knowledge and establish its particular focus. A qualitative content analysis of

company reports of the top five supermarkets in Japan and South Africa (based on revenues) was used to identify the main CES strategies promoted in the two countries. Expert interviews with different stakeholders in both countries, which reflected the main groups involved in CES activities in the retail sector (and especially the supermarket sector), were used to elicit perceptions on the drivers, tools, impacts and challenges of implementing CES strategies in Japan and South Africa.

A structured survey was administered to supermarket customers in Japan and South Africa to determine (a) awareness and perceptions of supermarket CES activities, (b) purchasing behavior, (c) socio-demographic characteristics and (d) environmental attitudes. The New Ecological Paradigm (NEP) scale was used to elicit the environmental attitudes of the respondents, as it has been widely used to measure environmental attitudes and environmental concern in different thematic and geographical contexts.

Report analyses and expert interviews in both countries suggest that CES adoption is significantly related to risk management activities driven by cost savings and pressure from various stakeholder groups. In both countries, the most widely adopted CES activities focus on internal operations, seeking to reduce energy use and GHG emissions. Waste management strategies generally focus on recycling and decreased packaging, with particular attention on (a) reducing the amount of food waste being incinerated or sent to landfills, (b) decreasing resource use in packaging materials and (c) engaging with customers to decrease the demand for single use plastic bags. Supply chain strategies have generally focused on the development and marketing of green private label products in leading companies such as Aeon and Woolworths. Other companies have focused solely on improving the efficiency of logistics to reduce fuel/energy use and GHG emissions. Product sustainability certifications are a key CES supply chain focus area in both case study countries, with Woolworths (South Africa) and Aeon (Japan) leading in this regard. Japanese supermarket companies are more involved in

stakeholder engagement activities among staff and consumers, while leading South African companies focus a lot on engaging with their suppliers around sustainability issues, particularly emerging farmers. CES strategies that seek to improve animal welfare, minimize food waste through collaborations with charities, and participate in international sustainability indices and disclosure projects have become prevalent in South African companies, but are still being explored by Japanese companies.

Report analyses and expert interviews show that companies develop specific targets and key performance indicators for their CES strategies, which are highlighted in their sustainability reports. Internal and external auditing of CES progress is increasingly being undertaken, with annual sustainability reports becoming the products of these efforts, especially to update stakeholders on company sustainability progress. These processes are guided by international frameworks such as the Global Reporting Initiative, International Organization for Standardization (ISO), the Sustainable Development Goals, Carbon Disclosure Project and the United Nations Global Compact. National environmental guidelines and regulations, such as the King III and King IV reporting guidelines (South Africa) and the Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging (Japan) play a key role in pushing CES implementation and reporting in the respective countries.

Expert interviews reveal that challenges sustainability managers face in implementing CES activities include (a) difficulties changing the perceptions and behavior among top management and store level staff, (b) lack of skills and capacity, (c) availability and costs of new technologies, (d) insufficient funds to finance CES projects, (e) lack of awareness among customers to change purchasing behavior, and (f) insufficient or inappropriate regulation and incentives for CES adoption. Significant progress is being by some leading companies in energy saving strategies, collaborations to reduce food waste, e-waste take back mechanisms, emerging farmer development, closed loop agriculture and animal welfare.

Consumer surveys suggest that a larger proportion of survey respondents in Japan were aware of supermarket CES activities (85%) compared to South Africa (63%). This can possibly be attributed to a more extensive focus of Japanese companies on consumer education and awareness-raising activities. Recycling-related activities were identified in both countries as the CES activities that were most visible and which customers were more aware of. Product quality was the factor ranked the most important to both survey groups when purchasing a product or a service, followed by the price of the product. The environmental impact of the product or service was ranked third (out of four factors) by Japanese respondents and last by South African respondents. This suggests that environmental considerations do not explicitly play a major role in influencing purchasing decisions for the two samples. Furthermore, there were weak correlations between NEP scores and (a) respondents' awareness of CES activities, (b) willingness to change to a more environmentally friendly supermarket company (if all factors remained the same), (c) choice of (and reason for) preferred supermarket, and (d) perceptions that supermarket CES strategies could have a positive effect on the natural environment. This suggests that respondents' NEP scores, and therefore environmental worldviews, do implicitly play a role in purchasing decisions and perceptions on CES strategies.

By looking critically into the results of the literature review, report analysis, expert interviews and consumer surveys, it is possible to identify several cross-thematic themes that need to be targeted to improve the adoption and success of CES in the retail sector. These include (a) valuing the role of leader companies in driving CES adoption, (b) exploring the role of NGOs as strategic partners, (c) identifying and promoting value addition with other aspects of company operation or boarder CSR activities, and (d) addressing market maturity issues in emerging and developing economies.

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DEDICATION

To Robert and our children.

We look forward to meeting you.

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LIST OF ABBREVIATIONS

ASC: Aquaculture Stewardship Council

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

CEO: Chief Executive Officer

CDP: Carbon Disclosure Project

CFCs: Chlorofluorocarbons

CSR: Corporate Social Responsibility

EU: European Union

FSC: Forest Stewardship Council

GDP: Gross Domestic Product

GHG: Greenhouse Gas

GRI: Global Reporting Initiative

GWP: Global Warming Potential

HFCs: Hydrofluorocarbons

HVAC: Heating, Ventilation and Air Conditioning

IDS: Institute of Development Studies

ISO: International Organization for Standardization

JAS: Japanese Agricultural Standard

JRC: Joint Research Centre

JSE: Johannesburg Stock Exchange

LED: Light-emitting Diode

MSC: Marine Stewardship Council

NEP: New Ecological Paradigm

NGO: Non-governmental Organization

NPO: Non-profit Organization

OECD: Organization for Economic Co-operation and Development

RFS: Retail Forum for Sustainability

RSPO: Roundtable on Sustainable Palm Oil

RTRS: Roundtable on Responsible Soy

SA: South Africa

SD: Standard deviation

SDGs: Sustainable Development Goals

TEEB: The Economics of Ecosystems and Biodiversity

UK: United Kingdom

UN: United Nations

UNDP: United Nations Development Programme

UNEP: United Nations Environment Programme

WBCSD: World Business Council for Sustainable Development

WRI: World Resources Institute

€: Euro

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 Introduction to CES in the Retail Sector

Global consumption and production trends remain unsustainable, even though sustainable development gained a lot of policy traction in the past decades (United Nations, 2015). As an important social actor, the private sector must play a leading role in identifying and implementing sustainable solutions (Azapagic & Perdan, 2000). In contrast to the anti-industry, anti-profit and anti-growth orientation of much of the early environmentalist movement, it has become increasingly clear that the business sector must play a central role in achieving the goals of sustainable development strategies (Elkington, 1994). Sustainable development and social responsibility have emerged as very important strategic issues for companies in virtually every industry (Fiksel, 2006).

This has been a gradual process since the 1992 Earth Summit in Rio de Janeiro that created a “*new energy in environmental governance, engaging actors beyond the state and across scales, from local to global, from communities to large transnational networks*” (Andonova & Hoffman, 2012: 57). Ten years later, the Rio +10 summit in Johannesburg, further promoted corporate responsibility and accountability (La Vina *et al.*, 2003). The UN Conference on Sustainable Development (Rio+20) went a step further by declaring that sustainable development “*can only be achieved with a broad alliance of people, governments, civil society and private sector, all working together to secure the future we want for present and future generations*” (United Nations, 2012 cited in Filho, *et al.*, 2015: 123). After Rio+20, the need to develop a framework to guide and advance business involvement has grown substantially, with stakeholders increasingly expressing the need to reshape the role of business (IDS, 2017). The Sustainable Development Goals (SDGs) adopted by the UN General Assembly in 2015 set out the post-2015 sustainable development agenda. SDG 12 advocates that principles of sustainable production and consumption must be widely adopted by 2030¹.

In this context, corporations are often perceived to have the resources needed to effectively address sustainability issues (Dyllick & Muff, 2016). Increased policy and consumer pressure to enhance environmental sustainability has often catalysed the development and

¹ Targets include, among others, to (a) achieve sustainable management and efficient use of natural resources, (b) encourage companies (especially large/transnational companies) to adopt sustainable practices and integrate sustainable information into their reporting cycle, and (c) substantially reduce waste generation through prevention, reduction, recycling and reuse.

implementation of corporate strategies to reduce the environmental impacts of the products and services offered by companies (Smith & Perks, 2010). According to the UN Global Compact (2014), businesses should adopt a precautionary approach to environmental challenges, undertake initiatives to promote greater environmental responsibility, and encourage the development and diffusion of environmentally friendly technologies.

The retail sector² is a global economic powerhouse that has an average annual growth rate of 3.8% since 2008 and estimated revenues of US\$ 22.6 trillion globally (which is expected to rise to US\$ 28 trillion by 2019) (BusinessWire, 2016). The sector represents 31% of the global Gross Domestic Product (GDP) and employs billions of people worldwide, with hypermarkets and supermarkets currently accounting for 35% of direct retail sales globally (ibid). As a result, the retail sector has substantial economic leverage and resources to effectively address sustainability issues.

At the same time retailers can have substantial environmental impacts. This includes direct impacts that stem from retailing operations (Brancoli *et al.*, 2017; Bradley, 2016; Zaatari *et al.*, 2016) and indirect impacts that stem from the production of retailed goods and other ancillary activities (Cimini & Moresi, 2018; Miah *et al.*, 2018). This research has not identified studies that assess the environmental impact of the retailing sector as a whole. However, there are several studies on the environmental impacts of individual retailers (Brancoli *et al.*, 2017; Mylona *et al.*, 2017), retailed products (Hallström *et al.*, 2018; Gutierrez *et al.*, 2017; Williams & Wikström, 2011), and supply chains (Fabbri *et al.*, 2018; Cicatiello *et al.*, 2016; Wang *et al.*, 2016), as well as studies that examine the environmental benefits of mitigation strategies in the retail sector (Gimeno-Frontera *et al.*, 2018; De Frias *et al.*, 2015; Hellström & Nilsson, 2011; Ubeda *et al.*, 2011). Such studies attest to the substantial environmental impact of the retailing sector, and its key role in enhancing societal sustainability.

Jones *et al.* (2009) suggest that as retailers are the active intermediaries between primary producers, manufacturers and consumers, they are in a singularly powerful position to drive sustainable consumption and production through (a) their own actions, (b) partnerships with suppliers and (c) daily interactions with consumers. There is “*huge potential for retailers to use their market position and influence over suppliers and consumers to drive environmental improvement*” (Styles *et al.*, 2012: 59). Giant retailers such as Wal-Mart have “*tremendous*

² Retailing consists of the final activities needed to either place a product in the hands of consumers or to provide a service to consumers. Retailing is usually the last step in a supply chain, so firms that sell products or provide services to the final consumer are performing the retailing function (Dunne *et al.*, 2011).

control and influence over both their suppliers and the individual consumers who ostensibly make demands on them” and they should be held “equally responsible for the choices they make in the wholesale and supply-chain marketplace” (ibid). However, the role of retailers in coordinating and fostering green practices across their value chains has been largely ignored within the academic literature (Lai *et al.*, 2010). In fact, Delai & Takahashi (2013) state that research on retail sustainability is lacking, especially in emerging country contexts. Tang *et al.* (2016: 394) assert that the literature on corporate social responsibility (CSR) is largely confined to the manufacturing industry³ with a “serious lack of focus on the retail sector”.

Retailers increasingly implement Corporate Environmental Sustainability (CES) strategies⁴ to improve their environmental performance. For example, in 2016 approximately 98% of the home furnishing materials (including packaging) of the multinational furniture and homeware retailer, IKEA, were made from renewable, recyclable or recycled materials (IKEA Group, 2016). Sainsbury’s, one of the UK’s biggest supermarket retailers, has consistently achieved zero waste to landfills since 2013 (Sainsbury’s Ltd, 2017). The multinational clothing retailer H&M, sourced 43% of their cotton from sustainable sources (aiming to increase this to 100% by 2020) (H&M Group, 2016).

1.2 Main Types of CES Strategies in the Retail Sector

Retailers usually undertake three main types of activities to promote sustainable production and consumption (UNEP, 2011 cited in Delai & Takahashi, 2013; Jones *et al.*, 2009; Lai *et al.*, 2010):

³ This possibly reflects the historical focus of sustainability literature on the manufacturing sector (Hassini *et al.*, 2012).

⁴ CES constitutes the environmental aspect of CSR (He & Chen, 2009). For the purpose of this study, we define CES as the actions taken by companies to decrease their internal and external impacts on the natural environment, in order to improve sustainable consumption and production throughout the supply chain.

Sustainable consumption is defined as the use of services and products that meet basic human needs and promote quality of life while minimizing natural resources and hazardous materials usage, as well as waste and emission generation in the whole product life cycle, so as not to affect the satisfaction of future generations’ needs (Delai & Takahashi, 2013).

Sustainable production is defined as the continuous application of an integrated preventive environmental strategy applied to processes, products and services to increase eco-efficiency and reduce risks to humans and the environment (ibid).

- Manage the sustainability impacts of their own operations (e.g. stores, headquarters and warehouses) through the implementation of environmental management systems (EMS);
- Manage sustainability impacts throughout the value chain usually through cooperation with their suppliers (e.g. to develop sustainable products, incentivize the adoption of cleaner production techniques and select suppliers according to sustainability criteria);
- Engage with stakeholders through consumer education about sustainable consumption, incentives to buy eco-friendly products and offering advice on product sustainability, use and disposal.

Table 1.1 includes some of the main CES subcategories identified through our literature review. Section 1.2 discusses the most prominent technical and behavioural strategies adopted by retailers to reduce their environmental impact and promote sustainability.

Table 1.1 Main Types of CES activities

Internal operations	Supply chain management	Stakeholder engagement
<ul style="list-style-type: none"> ▪ Energy management & GHG emissions reduction ▪ Integrated waste management ▪ Water conservation 	<ul style="list-style-type: none"> ▪ Sustainable sourcing ▪ Certification ▪ Take-back mechanisms ▪ Transportation efficiency ▪ Water conservation 	<ul style="list-style-type: none"> ▪ Customer engagement ▪ Staff training ▪ Shareholder/investor relations

Source: Adapted from (United Nations, 2011 in Delai & Takahashi, 2013; Jones *et al.*, 2009; Lai *et al.*, 2010)

1.2.1 Management of internal operations

1.2.1.1 Energy use and GHG emissions

Energy costs are typically the second highest operating expense for retailers, so implementing cost-effective energy saving strategies can have a direct and significant impact on profitability (ASHRAE, 2011). Given that many retailers operate hundreds of stores with millions of square meters of floor space (often between countries with different energy costs),

decreasing energy consumption has become a considerable source of investment both to increase profits and educate customers (Richmond & Simpson, 2016). The retail sector uses most of the consumed energy for lighting, heating, ventilation, air conditioning and refrigeration (Dixon-O'Mara & Ryan, 2018).

Ventilation for improving indoor air quality for the comfort of customers and workers is one of the most energy intensive activities in retail stores (Zaatari *et al.*, 2016). Commercial refrigeration⁵ for food freezing and conservation in retail stores and supermarkets is another important energy consuming activity (Mota-Babiloni, 2015). According to Fedrizzi & Rogers (2002) lighting usually represents 30-50 percent of energy use in big box retailers and supermarkets, and is usually the best opportunity to improve efficiency. Heating represents the second largest energy use in northern areas, particularly in large facilities (Fedrizzi & Rogers, 2002). Energy demand for heating can be reduced by as much as 50 percent by installing more efficient heating systems/controls, heat recovery equipment and limiting the amount of outside air entering facilities (*ibid*).

Building energy efficiency strategies for the retail sector entails, among others, setting energy-efficient lighting times and heating/cooling points, as well as ensuring that staff take responsibility for energy-saving actions (Christina *et al.*, 2015). The automation of temperature and lighting equipment is crucial to an energy efficiency strategy (*ibid*), while real time monitoring requires the physical installation of environmental and energy sensors in specific and representative points of buildings (Raimondo *et al.*, 2015).

In their study on big box retail stores Richmond & Simpson (2016) state that strategies for lighting, heating, cooling and ventilation efficiency have been tested using various technologies. For example, energy use for lighting can generally be reduced by 40-80 percent by installing more efficient lighting fixtures, improved lighting controls and taking advantage of daylight where available (Fedrizzi & Rogers, 2002). Hill *et al.* (2010) cited in Kolokotroni *et al.* (2015) summarized the benefits of low energy design initiatives such as enhanced utilization of daylight, combining natural and mechanical ventilation with heat exchange, improved refrigeration cabinets with doors on frozen food cabinets, improved control over lighting and ventilation, acceptance of a wider range of internal temperatures, LED display lighting and

⁵ Additionally, the extensive use of refrigerant gases (e.g. CFCs, HFCs) widely used in cold storage in supermarkets can contribute significantly to ozone depletion (Delai & Takahashi, 2013).

renewable energy sources such as biomass or wind power.

Overwhelmingly such strategies have been developed while maintaining the overarching goal of not negatively impacting the sales environment, as energy savings at the expense of reduced sales is not feasible (Richmond & Simpson, 2016). However, Raimondo *et al.* (2015) asserts that there is insufficient research on energy and climate assessment for retail environments, where the satisfaction of both workers and customers requires a strict control of the environmental conditions.

1.2.1.2 Waste management

Waste management is interconnected with material consumption practices since the reduction, reuse and recycling of materials can minimise waste generation and land use for waste disposal (Delai & Takahashi, 2013). Waste reduction is also vital to product stewardship, which requires integrating external stakeholders into product design and process development so that waste can be eliminated and other life-cycle environmental costs reduced (Lai *et al.*, 2010).

Food waste is a major social, nutritional and environmental issue that affects the sustainability of the food retail sector as a whole (Cicatiello, 2016). Lebersorger & Schneider (2014) state that waste prevention approaches in the food retail sector should focus on (a) avoiding returns, (b) transfer of best practices⁶, (c) informing and educating employees and customers and (d) strengthening food donations to social services.

Biodegradable packaging materials from renewable natural resources such as crops, have received increasing attention, particularly in EU countries. For example, noticeable progress has been made to create biodegradable materials with similar functionality to that of oil-based synthetic polymers (Davis & Song, 2006). As the materials are from renewable resources and biodegradable, it is foreseen that “*they would contribute to sustainable development and if properly managed would reduce their environmental impact upon disposal*” (Davis & Song, 2006: 147).

Another interesting way to reduce waste is to shift from selling a product to leasing it.

⁶ An example can be developing food loss and waste measurement protocols and setting food loss and waste reduction targets (Lipinski *et al.*, 2013).

Many companies have realized that for some products⁷ there is no need to own the actual product in order to obtain its services (Orsato, 2006). Consequently, by shifting from selling products to selling the function provided by them (i.e. the service) some firms can reduce both economic costs and environmental impacts (ibid). At the end of their life these leased products can be recovered by the companies that still own them “*to be either remanufactured and recycled in the same use or cascaded into different life cycles, thus closing the material loop completely*” (Azapagic & Perdan, 2000: 250). We can therefore argue that the service intensity of these products is raised because they provide a service that society requires but at least cost to the environment (Azapagic & Perdan, 2000). Finally, retailers may also facilitate product recycling or re-manufacturing for their suppliers or manufacturers by making use of their extensive networks of retail outlets as collection points for unused materials (Tang *et al.*, 2016).

1.2.2 Supply chain management

1.2.2.1 Product selection

Retailers can promote environmental improvements in supply chains through different tools. As discussed below, some of these tools include product performance labelling, third-party product certification, and establishing improvement programmes and environmental requirements for their suppliers (Styles *et al.*, 2012). Dekker *et al.* (2012) identify three product aspects relevant to environmentally friendlier supply chains: (a) the way the product has been produced, (b) the way it has been transported and waiting for use (inventories) and (c) whether the value of the product can be recovered after its use (reverse logistics). This requires the adoption of green supply chain management practices which require the integration of “*environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers, and end-of-life management of the product after its useful life*” (Srivastava, 2007: 54-55).

Environmentally conscious companies often look at the entire supply chain of their products, assess the environmental performance of their suppliers and make procurement choices on that basis (Ramanathan *et al.*, 2014). When retailers measure and publish the environmental performance of the products they sell, manufacturers are more likely to develop ‘greener’

⁷ Such examples include printing facilities, computer hardware, household appliances, baby prams and even carpeting (Agrawal, 2012; Intlekofer, 2010; Mont *et al.*, 2006).

products (Dekker *et al.*, 2012). Moreover, green retailing practices differ from green manufacturing practices, because retailers occupy a unique position that intermediates between suppliers and consumers (Tang *et al.*, 2016).

Sustainable sourcing and selection of items to stock can reduce the effect of large retailers on biodiversity and ecosystem services, benefiting companies in return through operating costs reduction, increased customer loyalty and supply chain security (TEEB, 2012). For these reasons many companies seek to buy greener products and materials (green procurement), with some companies participating in buyers' groups to leverage their collective buying power to coerce suppliers into considering alternative production practices (Mazurkiewicz, 2004).

Products that adhere to sustainability standards (e.g. products certified by the Forestry Stewardship Council (FSC), Marine Stewardship Council (MSC) and Roundtable on Sustainable Palm Oil (RSPO)), can further facilitate verification and compliance with environmentally responsible production practices across complex and geographically dispersed supply chains (Chkanikova & Mont, 2015). According to Dyllick & Muff (2016: 167) *“in order to deliver organic or fair trade products to the markets (e.g. textiles, coffee, tea, cacao, bananas, chicken), whole supply chains will have to be reconstructed and controlled, reaching from Third World farmers, to traders, processors, and end-user markets. Rule-changing strategies can be seen in the creation of new institutions securing sustainable supplies like the Marine Stewardship Council for fish and fisheries and the roundtables on sustainable soy or palm oil. They set new standards for sustainable practices and create transparency through certification. This changes the rules of the game for all or most competitors”*.

Retailers are also increasingly using choice editing⁸, which although fairly new to many businesses, has huge potential for advancing sustainable consumption and production (UNEP, 2012a). Giant retail companies such as Walmart, have developed their own rating systems which penalize unsustainable products *“to the point where a product may not be found on retail shelves at all. More subtle measures could include differential discounting or denying premium shelf space to less sustainable products”* (UNEP, 2015: 130). For example, Marks & Spencer have been credited as frontrunners in improving animal welfare by implementing their 100 percent

⁸ Choice editing refers to *“consciously limiting the consumer’s opportunities to select unsustainable products and services”* and willingly removing *“products known to be unsustainable, by either completely removing a product range or specific ingredients, components or types within ranges”* (Forum for the Future, 2008: 15).

free range egg policy, whereby all eggs sold in their stores are acquired from free range sources (Forum for the Future, 2008; Marks & Spencer PLC, 2018).

Finally, although it is important to adopt a life cycle mentality in product selection as a means to enhance the sustainability of supply chains, there remains a big gap in policy and practice (Chun & Lee, 2013). A life cycle perspective can provide a better picture of the interactions between product selection and the environment, and identify key parts within value chains that can be targeted for improvements (Azapagic & Perdan, 2000). In the context of life cycle thinking, the choice of suppliers directly affects the environmental performance of the products sold, and as an extension that of the retailers⁹ (ibid). In such contexts, reducing the consumption of resources used through an efficient logistics system benefits retailers, and also their suppliers (Tang *et al.*, 2016).

1.2.2.2 Green transportation

Transportation is a key element of retailing and a highly polluting activity (Ramanathan *et al.*, 2014). Therefore, improving transportation practices can substantially reduce the environmental impact of retailers. It has been suggested that green transportation, which involves the movement of goods with reduced materials, energy consumption and increased efficiency, can be a key element of green retailing (Tang *et al.*, 2016). This can include the appropriate selection of vehicle types, delivery schedules, freight flow consolidation and fuel selection, among others (Ubeda *et al.*, 2011). For example, large French retailers are increasingly adopting new logistics practices such as optimizing delivery schedules, replacing existing heavy goods vehicle fleets with less polluting vehicles (e.g. Casino), streamlining goods transport to decrease greenhouse gas emissions of carriers (e.g. Auchan) and combining road-rail transport (e.g. Decathlon) (Kessous *et al.*, 2016).

1.2.2.3 Water conservation

Companies have to implement water management procedures at the levels of the facility and the supply chain (UNEP, 2012b), with supply chain water footprints being much larger than

⁹ Important issues that need to be considered when establishing a relationship between supplier and retailer in order to reduce environmental impacts include: (1) the supplier's selection, development and partnership, (2) contracts and (3) development and production of sustainable products and services (Delai & Takahashi, 2013).

operational water footprints (Hoekstra *et al.*, 2011). Despite their extensive supply chains, retailers generally do not perceive water management as a major area of concern, focusing their internal water management operations on water use monitoring systems, rainwater harvesting and installation of automatic taps and urinal control systems (Chkanikova & Mont, 2011).

Excessive wasting of freshwater or reducing water quality will be seen as companies neglecting their fundamental obligations to society; they therefore increasingly need to demonstrate how their water use is both efficient and effective, while minimising the potential for environmental damage (Burritt *et al.*, 2016). However, if retailers decide to seriously take up the challenge of reducing their water footprints it is important to recognise that their supply chain water footprints overlap with that of their suppliers (Hoekstra, 2008). Considering the above, prioritising efforts to reduce supply chain water footprints may seem more cost-effective (Hoekstra *et al.*, 2011). This is important for water-intensive production processes “*such as farming and products with high embedded-water content such as meat, sugar and cotton*” (RFS, 2014: 1). Various tools can assist companies in reducing freshwater use, including the Global Compact principles, OECD Guidelines for Multinational Enterprises, GRI G3, CEO Water Mandate initiative, WBCSD Global Water Tool and Business Unit Water Footprint, among others (Lambooy, 2011).

Hoekstra *et al.* (2011) provide examples of how retailers can improve water management for both their internal operations and supply chains. Potential strategies include (a) recycling waste water and chemicals, (b) using water-saving appliances (e.g. dual flush toilets, dry sanitation equipment, water-saving irrigation equipment), (c) replacing/redesigning water-intensive processes, (d) agreeing on reduction targets with suppliers (e.g. avoid or minimize the use of substances in products such as soaps and shampoos that may be harmful when reaching water bodies), (e) switching to better suppliers, (f) investing in improved catchment management and sustainable water use, (g) reporting water-related efforts, targets and progress made in annual sustainability reports, (h) product water labelling, (i) business water certification, and (j) engaging with consumers, civil society organizations and governments on developing relevant regulation and legislation.

1.2.3 Stakeholder engagement

The effective design and implementation of sustainable production and consumption initiatives require multi-stakeholder engagement and partnerships (UNEP, 2015). An increasing emphasis on the interface of sustainability and stakeholder engagement will continue to protect retailers' license to operate (Forum for the Future, 2008). Customer engagement, staff training and shareholder/investor relations are important avenues for reducing the environmental impact of retailers (Table 1.1). Building strong relationships between customers and retailers is very important for educating and incentivising customers to purchase sustainable products, and eventually changing consumption and production patterns (UNEP, 2011 cited in Delai & Takahashi, 2013). According to Zhu & Sarkis (2016) organizations select and introduce green marketing strategies, which subsequently affect the purchasing behaviours of consumers (or alternatively consumer demand for green products is met through green marketing strategies). For example, the outdoor clothing retailer Patagonia has an impressive homepage¹⁰ that contains photographs, slideshows and videos focusing on issues such as organic cotton production, traceable supplies, climate change action, and repair-and-wear initiatives to minimize waste. The company also actively promotes environmental issues to raise awareness through their social media communications.

Another way to engage and collaborate with multiple stakeholders is through eco-labelling. Ecolabel standards are becoming more prevalent in CES strategies in the retail sector, and stakeholder engagement is central to their success. Ecolabels are designed to provide information on products' attributes to eventually decrease stakeholder uncertainty about the validity of green product claims (Darnall & Aragón-Correa, 2014). They are necessary in product packaging to communicate to consumers that a particular product is in some significant way less harmful to the environment (Tang *et al.*, 2004). Ecolabels can reduce the cost and effort of obtaining information and promote recycling behaviour to consumers (Taufique *et al.*, 2016). Ultimately the aim of eco-labelling in retail supply chains is to “*enable customers to participate in sustainable purchasing behaviour at the point of purchase*” (Hornibrook *et al.*, 2015: 270). Some ecolabel examples include the Forest Stewardship Council, International Energy Star, EU Flower (EU), Nordic Swan (Scandinavia), Blue Angel (Germany), Environmental Choice (Canada) and Good Environmental Choice (Australia) (Horne, 2009).

¹⁰ For more information, see: <http://www.patagonia.com/footprint.html>

Staff engagement can also catalyse retailing sustainability, as staff may simply not be equipped to effectively pursue a commitment toward corporate sustainability. This can be due to a lack of education and training, inability to relate sustainability to other corporate initiatives and lack of authority, among other reasons (Searcy, 2012). According to a study on how to improve retail energy efficiency behaviour in one of the UK's leading retailers, store managers and senior staff were found to have a vital role in directing other staff on responding to instructions from corporate headquarters and influencing them on how seriously to prioritise energy tasks (Christina *et al.*, 2015). Their results point to the importance of having clear task strategies, simple performance goals to train and support operational staff, consistent and responsive support systems to build trust and engagement with staff on the shop floor, leadership support, results feedback and providing rewards/recognition for exceptional performance (*ibid*).

For example, Marks & Spencer has implemented several initiatives to engage their employees on CES efforts, which include (a) communicate with employees about their 'Plan A' environmental and ethical program goals, achievements and activities through emails, posters, and an intranet site, (b) designate a 'Plan A Champion' at each store and office facility who distributes information, engages with and motivates staff, (c) offer employees free energy monitors and insulation for their homes, (d) launch an innovation fund to finance sustainability projects initiated by employees, and (e) include sustainability as part of training for general merchandise buyers (Siegel *et al.*, 2012). Such activities are promoted because even though employee engagement is *"just one piece of the puzzle, ...it is arguably the most significant owing to the enormous power of employees to reach and influence customers, suppliers, and co-workers, to say nothing of family and friends and the broader communities in which they live"* (Siegel *et al.*, 2012: 24).

Green investments¹¹ are another way to mobilize multiple stakeholders in CES activities. Green bonds¹² are an example of green investments that can help mobilize resources from domestic and international capital markets for climate change adaptation, renewables and other

¹¹ Reasons for green investments include: (a) ethical considerations, (b) economic returns, (c) legal or regulatory constraints to include an environmental dimension in investments, (d) improving reputation by publically showing concern for the environment (Amenc *et al.*, 2010).

¹² UNDP (2017) defines green bonds as *"innovative financial instruments where the proceeds are invested exclusively (either by specifying the use of the proceeds, direct project exposure, or securitization) in green projects that generate climate or other environmental benefits, for example in renewable energy, energy efficiency, sustainable waste management, sustainable land use (forestry and agriculture), biodiversity, clean transportation and clean water. Their structure, risk and returns are otherwise identical to those of traditional bonds."*

environment-friendly projects (UNDP, 2017). The market for green bonds has grown globally for institutional and retail investors, ranging from pension funds to socially-responsible retailers, seeking to invest in greener options (Wood & Grace, 2011). Finally, corporate sustainability reports, sustainability rankings and corporate green awards help investors make more informed decisions and allows the sustainability performance among different organizations to be compared over time (Skouloudis & Evangelinos, 2009).

1.3 Frameworks for implementing, measuring progress and reporting on CES

There is a wealth of frameworks that can guide retailers in implementing CES strategies, measuring progress, and communicating this to their stakeholders. These include voluntary sustainability frameworks, guidelines and indicators, which are critical in facilitating the effective implementation and success of CES strategies. Below some of the most widely adopted frameworks for implementing, measuring progress and reporting on CES globally are outlined (Figure 1.1). However, these are by no means the only relevant frameworks used for these activities.

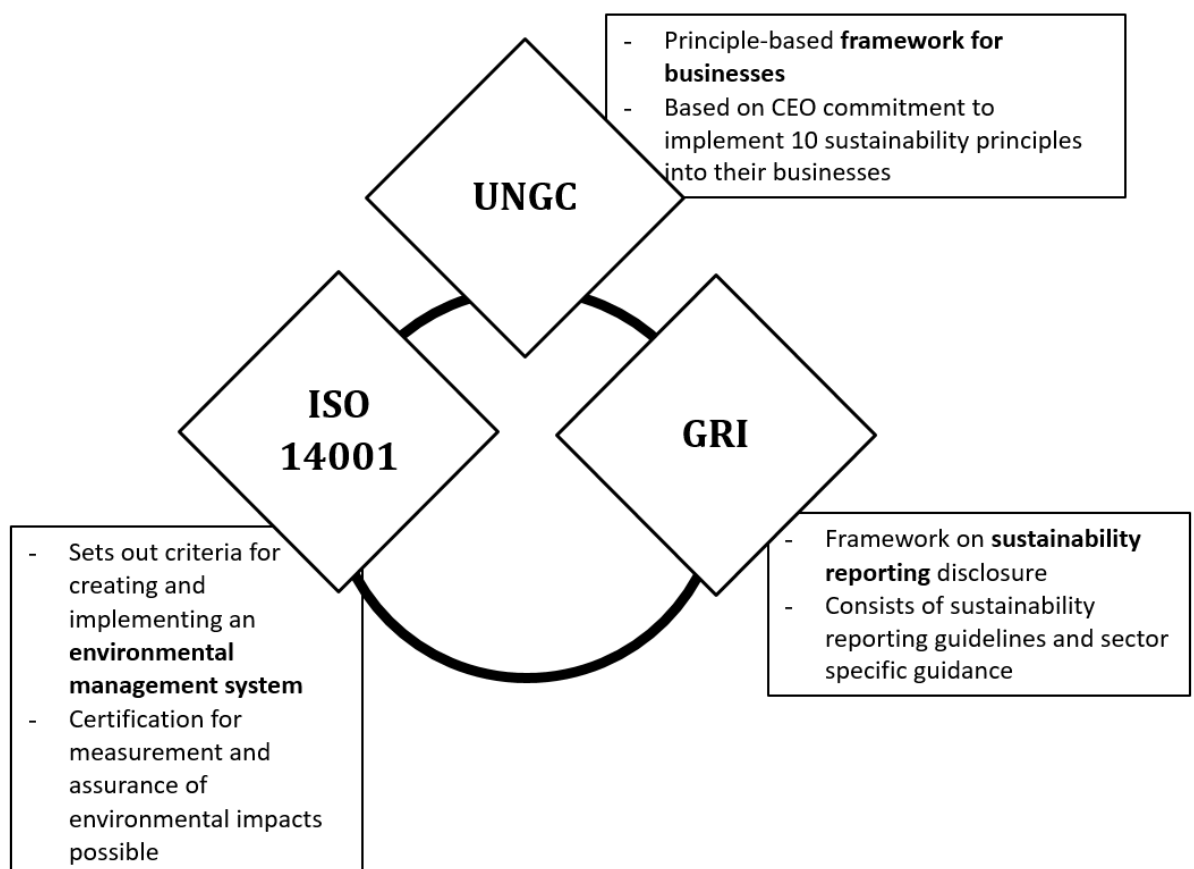


Figure 1.1 Primary CES voluntary frameworks adopted by retail companies

The United Nations Global Compact (UNGC) is often seen as a first step towards adopting CES strategies. It is a voluntary corporate citizenship initiative designed to push companies to move beyond traditional compliance and narrow risk assessments (UNGC, 2014). It is *“a leadership platform for the development, implementation and disclosure of responsible corporate policies and practices. Launched in 2000, it is the largest corporate sustainability initiative in the world, with over 8,000 companies and 4,000 non-business signatories based in 160 countries”* (United Nations, 2017). The compact covers ten principles in the areas of human rights, labour, anti-corruption and the environment¹³, and includes specific practices for endorsing organizations to enact both internal corporate practices and external initiatives (Coyne, 2006).

Environmental Management Systems (EMS) are implemented to increase corporate compliance and reduce environmental impacts. Steger (2000: 24) broadly defines EMS as *“a transparent, systematic process known corporate-wide, with the purpose of prescribing and implementing environmental goals, policies, and responsibilities, as well as regular auditing of its elements.”* The International Standardization Organization (ISO) is the world’s largest developer and publisher of management systems and guidance standards. ISO 14000 is one of the relevant environmental standards that can *“enable both public and private organizations to identify and manage impacts of their operations from a life-cycle perspective”* (UNEP, 2015: 57-8). ISO standards also outline the general principles for conducting social and environmental audits, the criteria for selecting audit teams, and the qualifications necessary for internal and external auditors (Epstein & Buhovac, 2014).

ISO 14001 sets out the requirements for an EMS and helps organizations improve their environmental performance by implementing more efficient resource use and waste reduction processes (ISO, 2015). However, the mere adoption of an EMS does not indicate a more sustainable operation, unless it is implemented properly (Azapagic & Perdan, 2000). According to the ISO 14001 standard, organizations must conduct regular EMS audits to check if the EMS has been properly implemented.

In the absence of regulatory requirements, voluntary reporting guidelines are important for improving the consistency and quality of disclosure in corporate responsibility reporting

¹³ The principles related to environmental issues are:

- Principle 7: businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

(KPMG, 2013). The Global Reporting Initiative (GRI) provides the most recognised set of voluntary guidelines for corporate sustainability reporting. It includes core performance indicators relevant to most organisations and information required by most stakeholders (Skouloudis & Evangelinos, 2009; Roca & Searcy, 2012). It represents the first global framework for comprehensive corporate sustainability reporting (Epstein, 2008) and includes sector-specific supplements with additional guidance on unique, sector-specific reporting needs (Coyne, 2006). The GRI's Sustainability Reporting Framework provides guidance on the disclosure of sustainability performance and the GRI list of indicators is a starting point for defining indicators and establishing the data collection protocols for sustainability auditing programs (Coyne, 2006) (see below).

Retail companies can adopt these voluntary frameworks to help frame sustainability issues pertaining to their operations and communicate their commitment to sustainability to corporate stakeholders (Epstein & Buhovac, 2014). The UNGC, ISO 14000 standard and GRI are complementary initiatives that can help retailers improve transparency when reporting their progress. Retailers such as H&M, Adidas and Woolworths (South Africa) have incorporated these frameworks into their corporate responsibility strategies, and refer to them in their sustainability reports. For example, H&M are signatories to the UNGC and their annual sustainability report serves as their Communication on Progress (COP) for the compact (H&M Group, 2017). Adidas is working with their athletic footwear suppliers to encourage the adoption of EMS systems, namely ISO 14001, to reduce the direct environmental impacts of manufacturing (Adidas AG, 2016). For the South African supermarket company, Woolworths, the GRI G4 Guidelines form the basis for their annual sustainability report and assists in identifying sustainability-related risks to their business (Woolworths Holdings Ltd, 2017).

As mentioned above, a corporate sustainability reporting and verification system normally involves internal and external audits. Internal sustainability audits are critical in evaluating financial and sustainability performance (Epstein & Buhovac, 2014). Internal auditing can allow companies to identify areas of concern and improvement, gather information to aid managerial decision-making, monitor performance, and report progress to managers (ibid). However, an important component of external reporting is independent verification. Sustainability audits conducted through third-party assurance processes and verifiers¹⁴ can

¹⁴ Such verifiers include accounting, consulting and specialised verification firms such as PricewaterhouseCoopers, KPMG, Ernst and Young and Deloitte (Fernandez-Feijoo, 2016). Shareholders or environmental NGOs can also provide such independent verification (Coyne, 2006).

narrow the ‘credibility gap’ by providing independent and nonbiased assessments of the content, veracity, and accuracy of an organization’s sustainability report or program (Coyne, 2006). This independent verification of corporate performance is increasingly being required by legislation and NGOs, so organizations that embrace sustainability principles should be prepared to have the performance of their sustainability program externally reviewed and scrutinised (ibid). Corporations increasingly find independent verification and progress evaluation desirable as it adds to the authenticity of the reported results and can essentially improve their credibility among stakeholders. However, while many consulting and accounting firms have begun performing external environmental audits, their level of detail and the level of external verification/assurance vary significantly (Epstein & Buhovac, 2014).

Sustainability reports are the final product of the reporting process. The aim is to essentially communicate the relevant information of sustainability performance to stakeholders in an attractive and straightforward way. Business leaders have to properly define and manage environmental communication, as failure to do so will increasingly pose a risk to their company's present/future value, undermine their position as a responsible corporate citizen and their competitive advantage (Elkington, 1994). Indeed, robust sustainability reporting can offer a competitive advantage, as organisations increasingly experience more pressure from national and international competitors (Skouloudis & Evangelinos, 2009). Morhardt *et al.* (2002) cited in Daub (2007) outline several reasons behind the increase in sustainability reporting including: (a) meeting regulatory requirements, (b) reducing the potential cost of future regulations through a pro-active approach, (c) improving the public perception of corporate environmental activities to maintain and enhance competitiveness, and (d) reinforcing corporate social legitimacy through the adoption of an active environmental management approach. While retailers use various methods to report their sustainability commitments and progress, publishing reports on company websites is the most popular and most accessible reporting mechanism (Morhardt, 2009 cited in Jones *et al.*, 2018).

Performance measurement systems are used to assess the achievement of corporate goals and ultimately to improve management and financial/strategic decision-making. This entails the assessment of different types of indicators through accurate, consistent, complete and relevant data to support corporate decisions (Krechovská & Procházková, 2014). Sustainability Performance Measurement Systems (SPMS) are key components of corporate sustainability initiatives. SPMS is “*a system of indicators that provides a corporation with information needed*

to help in the short and long-term management, controlling, planning and performance of the economic, environmental and social activities undertaken by the corporation” (Searcy, 2012: 240). By helping to better understand the current situation and the desired end-state, a well-designed SPMS can assist decision-makers in navigating the challenges of corporate sustainability (ibid).

Key performance indicators (KPIs) constitute the SPMS, and are used to measure progress and report corporate performance on set targets and objectives (KPMG, 2013). In fact corporate sustainability reports include environmental KPIs¹⁵, which are then compared against industry standards (Carritte *et al.*, 2015). While many environmental KPIs have been suggested in the literature, it is not clear how they are used in practice (Roca & Searcy, 2012). They may be developed based on organization-specific sustainability goals, opportunities, risks, and/or commitments, or alternatively from external indices with company-specific customization (Coyne, 2006). While there is no clear-cut list, performance indicators should be (a) accurate, (b) understandable and unambiguous, and (c) able to allow comparisons between years, benchmarks and regulatory targets (JRC, 2011d cited in Carritte *et al.*, 2015).

Retail companies, given their diverse operations and involvement in extended supply chains, adopt multiple types of CES strategies. Table 1.2 below summarises some of the main academic studies that have examined the performance of different types of CES strategies of retailers, and the indicators used to measure progress.

¹⁵ An environmental indicator is “*a parameter, or a value derived from parameters, which points to, provides information about, and describes the state of the environmental performance of a technique or measure*” (JRC, 2011c cited in Carritte *et al.*, 2015).

Table 1.2 Examples of studies on measuring CES progress in the retail sector

Reference	Country/region	Sector	CES issue/strategy	Indicators	Main findings
Myлона <i>et al.</i>, 2017	United Kingdom	Frozen food retail	Energy use and space environmental systems	Energy use per unit of sales area per year (kWh/m ² /year) Annual energy use contribution of each sub-system (lighting, refrigeration, HVAC and electrical equipment) (kWh/year)	Very high energy use intensity due to increased refrigeration load of 60% compared to 40% for typical supermarkets Closed frozen food cabinets allowed for acceptable and comfortable environmental conditions for staff and customers Highest energy reductions achieved when the HVAC system is operating during trading hours only. However this affects refrigeration performance due to increased indoor temperatures.
Spicer & Hyatt, 2017	USA	Supermarket retailer (Walmart)	Sustainable product sales strategy	NA	Move away from customer-facing initiatives (e.g. change consumer preferences, product labeling) to supplier-facing initiatives to spur innovations toward improving environmental or social performance without raising costs The shift did not require the direct buy-in from customers since more sustainable products continued to compete favorably in terms of price Walmart's strategy avoided the transaction costs of changing customer attitudes and behaviors, moving toward low-cost innovations that aligned with its existing low-cost strategy
Moser, 2016	Germany	Retail (daily needs)	Consumer purchasing behaviour for environmentally friendly products	Willingness to pay (WTP) for environmentally friendly products (€) Budget share: Ratio of expenditures for environmentally friendly products to the total expenditures in the respective product category for one year (percentage)	Self-reported purchasing behavior was not significantly related to actual green purchasing behavior in any product category High prices of green products seem to constrain the ability to purchase them Consumers reported WTP does not automatically influence their purchasing behaviour Consumers spent 2% or less of their expenditures on environmentally friendly laundry detergent or organic chocolate and meat, while shares for milk (5.1%), yogurt (6.3%) and eggs (15.7%) were higher. The highest budget shares were for recycled toilet paper (28.7%) and laundry detergent refill packs (44.4%).
Caritte <i>et al.</i>, 2015	United Kingdom	Food retail	Decarbonisation strategies	Fraction of in store electricity use from renewable sources (%) Mileage reduction for freight transport (km) Waste disposed to landfill (tons) Water savings in store through water harvesting (m ³)	Waste-related indicators are the most commonly reported environmental performance indicator category. This is likely because retailers have abundant experience in managing waste. Water-related impacts are the least reported environmental impact category
De Frias <i>et al.</i>, 2015	USA	Supermarkets	Energy cost reduction through retrofitting open refrigerated	Electrical energy consumption of refrigeration display cases (kWh/day)	Operational energy costs for refrigeration display cases with retrofitted doors were 69% less than with open display cases Cost of door retrofits could be recouped in less than two years by energy savings alone

			cases with doors		
Hornibrook et al., 2015	United Kingdom	Supermarket retailer	Carbon labelling in retail supply chains	NA	<p>Trial of carbon labels on the supermarket retailer's own brand products has had no discernible impact on shifting demand to lower carbon products</p> <p>Possible reasons include (a) lack of awareness and understanding of carbon labelling, (b) constraining or facilitating social and cultural influences, and (c) heterogeneity among consumers.</p>
Kolokotroni et al., 2015	United Kingdom	Food retail	Ventilation and energy use in buildings	Total operational CO ₂ emissions for entire operations (kgCO ₂ /year)	<p>Low energy ventilation strategies can lead to significant savings with attractive investment returns</p> <p>Low-ventilation options include (a) improved envelope air-tightness, (b) natural ventilation components, (c) reduction of specific fan power, (d) ventilative cooling, (e) novel refrigeration systems using CO₂ combined with ventilation heat recovery, and (f) storage with phase change materials.</p>
Delai & Takahashi, 2013	Brazil	Supermarkets and department stores	Corporate sustainability practices and management	NA	<p>Few internal eco-efficiency activities across the studied retailers. These are mainly implemented in new or "green stores" that focus on remediation rather than on the elimination of the causes of problem.</p> <p>Focus on suppliers' selection rather than developing partnerships to change processes and create more sustainable products</p> <p>Consumer sustainability awareness and education is limited to store communication, recycling stations and incentives to use eco-bags.</p>
Dos Santos et al., 2013	South Africa	National supermarket chain	Sustainable business indicators	<p>Reduction in relative energy consumption from benchmark (kWh/m²/year)</p> <p>Reduction in relative water consumption from benchmark (%)</p> <p>Carbon dioxide emissions (tCO₂/year)</p> <p>Reduction in food packaging (%)</p>	<p>Commitment by management has enabled performance targets and measures to be embedded into the company's overarching long-term strategic plan</p> <p>Continuous monitoring and revision of targets at tactical and operational levels against long-term objectives</p>
Galvez-Martos et al., 2013	Europe	Retail stores	Energy performance in the retail sector	<p>Specific energy consumption per number of stores and sales area (kWh/m²/year)</p> <p>Leakage control (% of refrigerant)</p> <p>Stores using natural refrigerants (%)</p> <p>Energy from alternative generation (%)</p>	<p>The relatively low importance of energy costs within the total operational costs of retailers reduces the economic attractiveness of energy saving measures</p> <p>Building characteristics substantially affect some of the indicators but are only partially under the control of retailers</p> <p>Lack of suppliers seriously constrains the uptake of novel technologies in some European regions. Demand for technical skills and training associated with innovative energy applications can reduce their rate of uptake.</p>

Kolk et al., 2010	China	Retail sector	Sustainability dimensions and reporting	NA	Chinese retailers report more on economic dimensions (including philanthropy), while international retailers operating in China report more on product responsibility. Environmental and labour issues receive relatively limited attention by both groups of retailers in China
Matopoulos & Bourlakis, 2010	Greece	Food retail	Sustainability practices and indicators in food retail logistics	Fraction of air-transported products to total products on the shelf (%) Fraction of direct-to-store deliveries to total number of deliveries (%) Frequency of deliveries to store (number per week) Fraction of vehicle filled to total capacity (%) Fraction of alternative fuel use compared to normal fuels (%)	Practical difficulties in assessing the overall sustainability performance of entire supply chains due to a significant fraction of transportation and distribution provided by third-party logistics providers Logistics managers do not consider sustainability issues in the design and implementation of transportation and distribution plans Strategic decision-making emphasizes mainly cost improvements, while sustainability can be considered only in connection with this objective.
Erol et al., 2009	Turkey	Grocery retailing	Sustainability indicators	NA	Categories for environmental sustainability indicators for grocery retailing include 'water consumption', 'energy consumption', 'category selection and management', and 'product and packaging recovery'.

Finally, sustainability rankings are used to identify exemplary corporate sustainability performance. These include, among others, the Corporate Knights Global 100, the Guardian Sustainable Business Awards, the Dow Jones Sustainability Index¹⁶ and Forbes Top 100 sustainability leaders (Bocken *et al.*, 2014). Similarly, numerous international and local 'green business awards' publically recognise corporate efforts to decrease their environmental impact. Retailers are increasingly awarded such honours¹⁷, which provide excellent public relations opportunities, distinguish companies as sustainability leaders, and attract potential investors.

1.4 Key literature patterns

As outlined above, the primary motive of retailers to implement CES strategies revolves around expected economic benefits, mainly due to cost savings from reducing operational

¹⁶ The Dow Jones Sustainability Index, established in 1999, identifies the best companies in specific sectors and was the "first index to attempt to assess the ability of businesses to create long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments" (Szèkely & Knirsch (2005: 634).

¹⁷ For example, the Green Awards in Ireland is in its 10th year and awarded its 'Green Retailer Award' to the supermarket retailer Lidl Ireland in 2018. In South Africa the supermarket company Woolworths was awarded the 'Corporate Citizenship Award' at the 15th annual National Business Awards in 2017.

expenses (see also Dummett, 2006). Overall energy conservation strategies and GHG emission reduction strategies dominate the CES agendas of retailers (Section 1.2.1.1), as energy use represents one of the highest operational expenses for retailers. Policy shifts and regulatory actions towards climate change and energy efficiency, (coupled with the escalating costs and unreliability of energy provision in some developing countries), can accelerate the investments of retailers in renewable energy and energy saving measures.

Retailers also prioritise waste reduction strategies such as decreasing food waste and reducing/recycling packaging materials (Section 1.2.1.2). This largely relates to increasing waste disposal costs, as retailers have to regularly and appropriately dispose of substantial amounts of plastic, cardboard and food waste. Of the CES strategies we have identified in Section 1.2, there is particularly little peer-reviewed literature on CES strategies on water use in the retail sector. While some articles do mention indicators related to water use in the retail sector, there is a critical lack of studies on specific strategies such as the instalment of water saving technologies or pollution control measures. This is possibly because the highest amount of water use occurs in upstream supply chains during food production/packaging or product manufacturing (Section 1.2.2.3), which are not under retailers' direct control, which means that many of the environmental costs are externalised (Yu *et al.*, 2010; Ridoutt *et al.*, 2015; Hoekstra *et al.*, 2011). Retailers may view this as an issue that pertains to the suppliers or manufacturers, which goes beyond their own operations, and therefore take less initiative to tackle. The price and availability of water may also affect actions to address its use and conservation. For example, low water tariffs and reliable supply in some countries may encourage lack of action from retailers.

It is interesting to note that the justification of CES investments in the retail sector on ethical grounds is rarely mentioned and elucidated in the peer-reviewed literature. While it may be the 'right thing to do' and companies want to be seen as 'doing the right thing', altruism is not perceived as a key reason for CES adoption. While Saha & Darnton (2005) suggest that altruism or moral concerns (e.g. concern about environmental issues) may influence those decision-makers that feel a sense of responsibility to the environment and the community, this review suggests that a CES strategy is unlikely to be adopted unless there is a good business case or financial incentive for it. It is noteworthy that peer-reviewed literature which suggests that resource availability and degradation concerns are primary CES drivers in the retail sector¹⁸

¹⁸ This comes in contrast with other sectors that depend on natural resources such as mining, pharmaceuticals, tourism and fisheries (TEEB, 2012).

could not be identified (although they may jeopardize supply chain security, thereby having an indirect negative impact on revenues) (TEEB, 2012).

Regulatory pressure seems to drive CES up to a certain extent, but does not explain why some companies decide to go beyond measures required by law, as shown by company examples discussed previously (see Section 1.2). On the other hand, expectations from internal and external stakeholders are increasingly becoming the dominant driver for CES in the retail sector. For example, environmental organisations, consumer groups, the media, governments, and even competitors, put pressure on retailers to increase accountability and transparency when reporting the impacts of their internal operations and wider supply chains (Section 1.2.3). Pressure from rival companies to implement CES strategies and sustainability should not be underestimated as this can be perceived as a competitive advantage (Skouloudis & Evangelinos, 2009).

Market-based instruments such as sustainability standards have become a very popular tool to facilitate verification and assure compliance with sustainability best practices for various products (Chkanikova & Mont, 2015). For example, retailers increasingly work with organisations such as the Roundtable on Responsible Soy (RTRS), and the Better Cotton Initiative (BCI), among several others, to ensure the sustainable sourcing of certain raw materials and finished products (Section 1.2).

To elucidate further, as more retailers join the BCI the demand for sustainably sourced cotton has risen substantially, with 12% of global cotton production already licensed as ‘Better Cotton’¹⁹ (the expected target for 2020 is 30%) (BCI, 2016). Aeon, Japan’s largest supermarket chain, introduced its first MSC certified product in 2006 and has committed to further increase the sales of certified seafood. Its target is that by 2020, 15% of seafood sales by volume will come from MSC certified fisheries or Aquaculture Stewardship Council (ASC) certified farms (MSC, 2017). Through collaboration with the RSPO, leading UK retailers have reached their target of selling 100% certified sustainable palm oil by the end of 2015 (RSPO, 2017). Similarly, the RTRS has a significant presence in the UK retail sector, with top retailers such as Marks & Spencer, ASDA and Tesco being members (RTRS, 2014).

Finally, there is a relative lack of studies discussing indicators to evaluate the performance of CES interventions in the retail sector, with most of these studies focusing on food retailers and supermarkets (Table 1.2) (Spicer & Hyatt, 2017; Caritte *et al.*, 2015; De Frias *et al.*, 2015;

¹⁹ For more information, refer to: <https://bettercotton.org/about-bci/who-we-are/>

Hornibrook *et al.*, 2015; Kolokotroni *et al.*, 2015; Ochieng *et al.*, 2014; Delai & Takahashi, 2013; Dos Santos *et al.*, 2013; Matopoulos & Bourlakis, 2010; Erol *et al.*, 2009). Studies for other types of retailers such as electronics, clothing and home furnishing, are very few and apart in the peer-reviewed literature.

REFERENCES

- Adidas AG. 2016. 2016 Adidas Sustainability Progress Report. Adidas AG, Herzogenaurach: Germany.
- Aeon Co., Ltd. 2016. 2016 Sustainability Report. Aeon, Co., Ltd., Japan.
- Agrawal, V.V., Ferguson, M., Toktay, L.B., & Thomas, V.M. 2012. Is leasing greener than selling? *Management Science*, 58(3): 523-533.
- Allied Market Research. 2018. Global Waste Management Market Expected to Reach \$285.0 Billion by 2023. Retrieved from <https://www.prnewswire.com/news-releases/global-waste-management-market-expected-to-reach-2850-billion-by-2023---allied-market-research-679274083.html>. Accessed on 3 November 2018.
- Amenc, N., Goltz, F., & Tang, L. 2010. Adoption of green investing by institutional investors: a European survey. EDHEC-Risk Institute, Nice: France.
- Anderson, M. W. (2012). New ecological paradigm (NEP) scale. *The Berkshire Encyclopedia of Sustainability: Measurements, Indicators, and research Methods for Sustainability*, 260-262.
- Andonova, L.B., & Hoffmann, M.J. 2012. From Rio to Rio and beyond: innovation in global environmental governance, *Journal of Environment and Development*, 21(1): 57-61.
- ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers). 2011. Advanced Energy Design Guide for Medium to Big Box Retail Buildings: Achieving 50% Energy Savings Toward a Net Zero Energy Building. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta: USA.
- Azapagic, A. 2003. Systems approach to corporate sustainability: A general management framework, *Trans IChemE*, 81 (B): 313-316.
- Azapagic, A., & Perdan, S. 2000. Indicators of sustainable development for industry: A general framework, *Trans IChemE*, 78: 243-261.
- BCI (Better Cotton Initiative). 2016. BCI 2016 Annual Report. Better Cotton Initiative, Geneva: Switzerland.
- Bocken, N.M.P., Short, S.W., Rana, P., & Evans, S. 2014. A literature and practice review to develop sustainable business model archetypes, *Journal of Cleaner Production*, 65: 42-56.
- Bradley, P. 2016. Environmental impacts of food retail: A framework method and case application, *Journal of Cleaner Production*, 113: 153-166.
- Brancoli, P., Rousta, K., & Bolton, K. 2017. Life cycle assessment of supermarket food waste, *Resources, Conservation and Recycling*, 118: 39-46.
- Braun, M.R., Beck, S.B.M., Walton, P., & Mayfield, M. 2016. Estimating the impact of climate change and local operational procedures on the energy use in several supermarkets throughout Great Britain, *Energy and Buildings*, 111: 109–119.
- Braun, V., & Clarke, V. (2012). APA handbook of research methods in psychology. *Cooper H, Thematic analysis*, 2.

Brown, D. B. 2009. Choosing the Right Type of Rotation in PCA and EFA, JALT Testing & Evaluation SIG Newsletter 13(3): 20-25, University of Hawai'i at Manoa.

Burch, D., & Lawrence, G. A. 2005. Supermarket own brands, supply chains and the transformation of the agri-food system, *International Journal of Sociology of Agriculture and Food*, 13(1): 1-18.

BusinessTech. 2018. Get ready to pay more for plastic bags when you go shopping. Retrieved from <https://businesstech.co.za/news/finance/227033/get-ready-to-pay-more-for-plastic-bags-when-you-go-shopping/>. Accessed on 10 August 2018.

Burritt, R.L., Christ, K.L., & Omori, A. 2016. Drivers of corporate water-related disclosure: Evidence from Japan, *Journal of Cleaner Production*, 129: 65-74.

BusinessTech. 2016. How many SA households earn more than R200.000 per month. Retrieved from <https://businesstech.co.za/news/wealth/132507/how-many-households-in-south-africa-earn-more-than-r200000-per-month/>. Accessed on 11 November 2018.

BusinessWire. 2016. Global Retail Industry Worth USD 28 Trillion by 2019 - Analysis, Technologies & Forecasts Report 2016-2019 - Research and Markets. Retrieved from

<http://www.businesswire.com/news/home/20160630005551/en/Global-Retail-Industry-Worth-USD-28-Trillion>. Accessed on 27 November 2016.

Caritte, V., Acha, A., & Shah, N. 2015. Enhancing corporate environmental performance through reporting and roadmaps, *Business Strategy and the Environment*, 24: 289–308.

Chen, X. 2018. When does store consolidation lead to higher emissions? *International Journal of Production Economics*, 202: 109-122.

Chkanikova, O., & Lehner, M. 2015. Private eco-brands and green market development: Towards new forms of sustainability governance in the food retailing, *Journal of Cleaner Production*, 107: 74-84.

Chkanikova, O., & Mont, O. 2011. Overview of sustainability initiatives in European food retail sector. International Institute for Industrial Environmental Economics, Lund University, Lund: Sweden.

Chkanikova, O., & Mont, O. 2015. Corporate supply chain responsibility: drivers and barriers for sustainable food retailing, *Corporate Social Responsibility and Environmental Management*, 22: 65–82.

Christina, S., Waterson, P., Dainty, A., & Daniels, K. 2015. A socio-technical approach to improving retail energy efficiency behaviours, *Applied Ergonomics*, 47: 324-335.

Chun, Y-Y., & Lee, K-M. 2013. Life cycle-based generic business strategies for sustainable business models, *Journal of Sustainable Development*, 6(8).

Cicatiello, C., Franco, S., Pancino, B., & Blasi, E. 2016. The value of food waste: An exploratory study on retailing, *Journal of Retailing and Consumer Services*, 30: 96–104.

Cimini, A., & Moresi, M. 2018. Are the present standard methods effectively useful to mitigate the environmental impact of the 99% EU food and drink enterprises?, *Trends in Food Science & Technology*, 77: 42–53.

Clark, William C. "Sustainability science: a room of its own." (2007): 1737-1738.

- Coyne, K.L. 2006. Sustainability auditing: Evaluating organisations' progress towards sustainable development, *Environmental Quality Management*, 16(2): 25-41.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Crush, J. S., & Frayne, G. B. 2011. Urban food insecurity and the new international food security agenda. *Development Southern Africa*, 28(4): 527-544.
- Darnall, N., & Aragón-Correa, J.A. 2014. Can ecolabels influence firms' sustainability strategy and stakeholder behaviors? *Organization & Environment*, 27(4): 319-327.
- Daub, C-H. 2007. Assessing the quality of sustainability reporting: an alternative methodological approach, *Journal of Cleaner Production*, 15: 75-85.
- Davis, G., & Song, J.H. 2006. Biodegradable packaging based on raw materials from crops and their impact on waste management, *Industrial Crops and Products*, 23: 147–161.
- De Frias, J.A., Luo, Y., Kou, L., Zhou, B., & Wang, Q. 2015. Improving spinach quality and reducing energy costs by retrofitting retail open refrigerated cases with doors, *Postharvest Biology and Technology*, 110: 114-120.
- Dekker, R., Bloemhof, J., & Mallidis, I. 2012. Operations research for green logistics – An overview of aspects, issues, contributions and challenges, *European Journal of Operational Research*, 219: 671–679.
- Delai, I., & Takahashi, S. 2013. Corporate sustainability in emerging markets: Insights from the practices reported by the Brazilian retailers, *Journal of Cleaner Production*, 47: 211-221.
- Deloitte Touche Tohmatsu Ltd. Global Powers of Retailing 2018. Analysis of financial performance and operations for fiscal years ended through June 2017 using company annual reports. Deloitte Touche Tohmatsu Ltd., London: United Kingdom.
- DesJardin, J. 2005. Business and environmental sustainability, *Business and Professional Ethics Journal*, 24: 35-59.
- D'Haese, M., & Van Huylenbroeck, G. 2005. The rise of supermarkets and changing expenditure patterns of poor rural households case study in the Transkei area, South Africa. *Food Policy*, 30(1): 97-113.
- Dixon-O'Mara, C., & Ryan, L. 2018. Energy efficiency in the food retail sector: barriers, drivers and acceptable policies, *Energy Efficiency*, 11: 445-464.
- Dos Santos, M.A., Svensson, G., & Padin, C. 2013. Indicators of sustainable business practices: Woolworths in South Africa, *Supply Chain Management: An International Journal*, 18(1): 104-108.
- Dummett, K. 2006. Drivers for corporate environmental responsibility (CER), *Environment, Development and Sustainability*, 8: 375–389.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. 2000. New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, 56(3): 425-442.
- Dunne, P.M., Lusch, R.F., & Carver, J.R. 2011. Retailing. 7th ed. South Western, Cengage Learning: Mason, USA.

Dyllick, T., & Muff, K. 2016. Clarifying the meaning of sustainable business: Introducing a typology from business-as-usual to true business sustainability, *Organization & Environment*, 29(2): 156–174.

Elkington, E. 1994. Towards the sustainable corporation: Win-win-win business strategies for sustainable development, *California management review*, 36(2): 90-100.

Epstein, M.J. 2008. Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental and Economic Impacts. Greenleaf Publishing, Sheffield: UK.

Epstein, M.J., & Buhovac, A.R. 2014. Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental and Economic Impacts. 2nd ed. Greenleaf Publishing, Sheffield: UK.

Erdoğan, N. 2009. Testing the new ecological paradigm scale: Turkish case, *African Journal of Agricultural Research*, 4(10): 1023-1031.

Erol, I., Cakar, N., Erel, D., & Sari, R., 2009. Sustainability in the Turkish retailing industry, *Sustainable Development*, 17(1): 49-67.

Fabbri, S., Olsen, S.I., & Owsianiak, M. 2018. Improving environmental performance of post-harvest supply chains of fruits and vegetables in Europe: Potential contribution from ultrasonic humidification, *Journal of Cleaner Production*, 182: 16-26.

FamilyMart UNY Holdings Co., Ltd. 2016. Environmental Report 2016. FamilyMart UNY Holdings Co., Japan.

Food and Agriculture Organisation (FAO). 2017. Retrieved from <http://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/1036297/>. Accessed on 12 January 2019.

Favacho, S. 2016. Organizational Greenhouse Gas Emissions (Carbon Footprint) Disclosure, Carbon Neutral Pty. Ltd., Australia.

Fedrizzi, R., & Rogers, J. 2002. Energy Efficiency Opportunities: Big Box Retail and Supermarkets. Global Environment & Technology Foundation (GETF), Arlington: USA.

Fernandez-Feijoo, B., Romero, S., & Ruiz, S. 2016. The assurance market of sustainability reports: What do accounting firms do?, *Journal of Cleaner Production*, 139: 1128-1137.

Fiksel, J. 2006. Sustainability and resilience: Toward a systems approach, *Sustainability: Science, Practice, & Policy*, 2(2): 14-21.

Filho, W.L., Manolas, E., & Pace, P. 2015. The future we want: Key issues on sustainable development in higher education after Rio and the UN decade of education for sustainable development, *International Journal of Sustainability in Higher Education*, 16(1): 112-129.

Fischer, D., Stanszus, L., Geiger, S., Grossman, P., & Schrader, U. 2017. Mindfulness and sustainable consumption: A systematic literature review of research approaches and findings, *Journal of Cleaner Production*, 162: 544-558.

Flyvbjerg, B. 2006. Five misunderstandings about case-study research. *Qualitative inquiry*, 12(2): 219-245.

Forum for the Future. 2008. Retail Leadership: What are the hallmarks of a sustainable retail business? Forum for the Future: Action for a sustainable world, London: UK.

Fricke, B. A., Sharma, V., & Abdelaziz, O. (2017). *Low Global Warming Potential Refrigerants for Commercial Refrigeration Systems*. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States).

Galvez-Martos, J-L., Styles, D., & Schoenberger, H. 2013. Identified best environmental management practices to improve the energy performance of the retail trade sector in Europe, *Energy Policy*, 63: 982-994.

Gao, S. S., & Zhang, J. J. 2006. Stakeholder engagement, social auditing and corporate sustainability, *Business process management journal*, 12(6): 722-740.

Gimeno-Frontera, B., Mainar-Toledo, M.D., de Guinoa, A.S., Zambrana-Vasquez, D., & Zabalza-Bribián, I. 2018. Sustainability of non-residential buildings and relevance of main environmental impact contributors' variability: A case study of food retail stores buildings, *Renewable and Sustainable Energy Reviews*, 94: 669-681.

Gray, D.E. 2014. *Doing Research in the Real World*. 3rd ed. Sage, London: UK.

GreenCape, 2017. Waste Economy. 2017 Market Intelligence Report. GreenCape, Cape Town, South Africa.

Gutierrez, M.M., Meleddu, M., & Piga, A. 2017. Food losses, shelf life extension and environmental impact of a packaged cheesecake: A life cycle assessment, *Food Research International*, 91: 124-132.

Hallstein, E., & Villas-Boas, S. B. 2013. Can household consumers save the wild fish? Lessons from a sustainable seafood advisory, *Journal of Environmental Economics and Management*, 66(1): 52-71.

Hallström, E., Håkansson, N., Åkesson, A., Wolk, A., & Sonesson, U. 2018. Climate impact of alcohol consumption in Sweden, *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2018.07.295>

Hassini, E., Surti, C., & Searcy C. 2012. A literature review and a case study of sustainable supply chains with a focus on metrics, *International Journal of Production Economics*, 140: 69–82.

He, M., & Chen, J. 2009. Sustainable development and corporate environmental responsibility: Evidence from Chinese corporations, *Journal of Agricultural and Environmental Ethics*, 22: 323–339.

Hellström, D., & Nilsson, F. 2011. Logistics-driven packaging innovation: A case study at IKEA, *International Journal of Retail & Distribution Management*, 39(9), 638-657.

Higuchi, K., & Norton, M. G. 2008. Japan's Eco-Towns And Innovation Clusters-Synergy Towards Sustainability. *Global Environment*, 1(1): 224-243.

Hoekstra, A.Y. 2008. Water neutral: reducing and offsetting the impacts of water footprints. UNESCO-IHE Value of Water Research Report Series No. 28, Delft: The Netherlands.

Hoekstra, A.Y., Chapagain, A.K., Aldaya, M.M., & Mekonnen, M.M. 2011. The Water Footprint Assessment Manual: Setting the global standard. Earthscan, London: UK. Retrieved from http://waterfootprint.org/media/downloads/TheWaterFootprintAssessmentManual_2.pdf. Accessed on 20 November 2016.

Horne, R.E. 2009. Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption, *International Journal of Consumer Studies*, 33: 175–182.

Hornibrook, S., May, C., & Fearn, A. 2015. Sustainable development and the consumer: Exploring the role of carbon labelling in retail supply chains, *Business Strategy and the Environment*, 24: 266–276.

Hughes, A., McEwan, C., & Bek, D. 2015. Mobilizing the ethical consumer in South Africa, *Geoforum*, 67: 148-157.

H&M Group. 2016. The H&M Group Sustainability Report 2016. H&M Group, Stockholm: Sweden.

H&M Group. 2017. H&M Group Sustainability Report 2017. H&M Group, Stockholm: Sweden.

IDS (Institute of Development Studies). 2017. The private sector and the Sustainable Development Goals. Retrieved from <https://www.ids.ac.uk/opinion/the-private-sector-and-the-sustainable-development-goals>. Accessed on 15 November 2017.

Ikea Group. 2016. Sustainability Report FY16. Ikea Group, Leiden: Netherlands.

Intlekofer, K., Bras, B., & Ferguson, M. 2010. Energy implications of product leasing, *Environmental Science and Technology*, 44(12): 4409–4415.

Izumi Co. Ltd., 2016. Annual Report 2016. Izumi Co. Ltd., Japan.

ISO (International Standardization Organisation). 2015. Introduction to ISO 14001: 2015. ISO, Geneva: Switzerland.

Johnson, R. B., & Onwuegbuzie, A. J. 2004. Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7): 14-26.

Japan Times. 2013. Reducing food loss. Retrieved from <https://www.japantimes.co.jp/opinion/2013/08/27/editorials/reducing-food-loss/#.XBBb32gzZGN>. Accessed on 3 August 2018.

Jones, P., & Comfort, D. 2018. Storytelling and sustainability reporting: An exploratory study of leading US retailers, *Athens Journal of Business and Economics*.

Jones, P., Comfort, D., & Hillier, D. 2009. Marketing sustainable consumption within stores: A case study of the UK's leading food retailers, *Sustainability*, 1: 815-826.

Joshi, Y., & Rahman, Z. 2015. Factors affecting green purchase behaviour and future research directions. *International Strategic management review*, 3(1-2): 128-143.

Johannesburg Stock Exchange (JSE). 2013. We make it easier to invest in companies that invest in the future. Retrieved online from <https://www.jse.co.za/services/market-data/indices/ftse-jse-africa-index-series/responsible-investment-index>. Retrieved on 30 September 2018.

- Kates, R. W., Clark, W. C., Corell, R., Hall, J. M., Jaeger, C. C., Lowe, I., ... & Faucheux, S. 2001. Sustainability science. *Science*, 292(5517): 641-642.
- Keeso, A. 2014. Big data and environmental sustainability: a conversation starter. Smith School of Enterprise and the Environment. Working Paper Series 14-04. University of Oxford, Oxford: UK.
- Kessous, A., Boncori, A-L., & Paché, G. 2016. Are consumers sensitive to large retailers' sustainable practices? A semiotic analysis in the French context, *Journal of Retailing and Consumer Services*, 32: 117-130.
- Kolk, A., Hong, P., & van Dolen, W. 2010. Corporate Social Responsibility in China: An analysis of domestic and foreign retailers' sustainability dimensions, *Business Strategy and the Environment*, 19: 289-303.
- Kolokotroni, M., Tassou, S. A., & Gowreesunker, B.L. 2015. Energy aspects and ventilation of food retail buildings, *Advances in Building Energy Research*, 9(1): 1-19.
- Konefal, J., Mascarenhas, M., & Hatanaka, M. 2005. Governance in the global agro-food system: Backlighting the role of transnational supermarket chains, *Agriculture and Human Values*, 22(3): 291-302.
- KPMG International. 2013. The KPMG Survey of Corporate Responsibility Reporting 2013. KPMG International Cooperative, Switzerland.
- Lai, K-H., Cheng, T.C.E., & Tang, A.K.Y. 2010. Green retailing: Factors for success, *California Management Review*, 52(2): 5-31.
- Lambooy, T. 2011. Corporate social responsibility: Sustainable water use, *Journal of Cleaner Production*, 19: 852-866.
- La Vina, A., Hoff, G., & DeRose, A.M. 2003. The outcomes of Johannesburg: Assessing the world summit on sustainable development, *SAIS Review*, 23(1): 53-70.
- Lebersorger, S., & Schneider, F. 2014. Food loss rates at the food retail, influencing factors and reasons as a basis for waste prevention measures, *Waste Management*, 34: 1911-1919.
- Le Blanc, D. 2015. Towards integration at last? The sustainable development goals as a network of targets, *Sustainable Development*, 23(3): 176-187.
- Leonard-Barton, D. 1990. A dual methodology for case studies: Synergistic use of a longitudinal single site with replicated multiple sites. *Organization science*, 1(3): 248-266.
- Life Corporation Inc., 2016. Social and Environmental activity report 2016. Life Corporation Inc., 2016, Japan.
- Lipinski, B., Hanson, C., Lomax, J., Kitinoja, L., Waite, R., & Searchinger, T. 2013. Installment 2 of Creating a Sustainable Food Future: Reducing food loss and waste. Working paper June 2013. World Resources Institute, Washington: USA.
- Liu, C., Hotta, Y., Santo, A., Hengesbaugh, M., Watabe, A., Totoki, Y., ... & Bengtsson, M. 2016. Food waste in Japan: Trends, current practices and key challenges, *Journal of Cleaner Production*, 133: 557-564.

Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C., & Hung Byers, A. 2011. *Big Data: The Next Frontier for Innovation, Competition, and Productivity*. McKinsey Global Institute, San Francisco: USA.

Marks & Spencer PLC. 2018. Eggs: Raw materials, commodities and ingredients. Retrieved from: <https://corporate.marksandspencer.com/plan-a/food-and-household/product-standards/raw-materials-commodities-and-ingredients/eggs>. Accessed on 12 March 2018.

Massmart Holdings Ltd. Integrated Annual Report 2016. Massmart Holdings Ltd, South Africa.

Matete, O.M. 2009. *Towards a zero waste South Africa: A case study on post-consumer solid waste management in rural and urban areas*, PhD dissertation, University of KwaZulu-Natal, South Africa.

Matopoulos, A., & Bourlakis, M. 2010. Sustainability practices and indicators in food retail logistics: Findings from an exploratory study, *Journal on Chain and Network Science*, 10(3): 207-218.

Mazurkiewicz, P. 2004. *Corporate Environmental Responsibility: Is a common CSR framework possible?*. World Bank, Washington DC: USA.

Merriam, S.B., & Tisdell, E.J. 2016. *Qualitative research: A guide to design and implementation*. 4th ed. Wiley Brand, San Francisco: USA.

Mesquista, J. M., & Lara, J. E. 2007. Attributes determining store loyalty: a study of the supermarket sector, *Brazilian Business Review (English Edition)*, 4(3): 218-234.

Miah, J.H., Griffiths, A., McNeill, R., Halvorson, S., Schenker, U., Espinoza-Orias, N.D., Morse, S., Yang, A., & Sadhukhan, J. 2018. Environmental management of confectionery products: Life cycle impacts and improvement strategies, *Journal of Cleaner Production*, 177: 732-751.

Minister of Agriculture and Agri-Food Canada. 2016. *Modern Grocery Retailing in Japan*. Minister of Agriculture and Agri-Food Canada, Ottawa: Canada. Retrieved from <http://www.agr.gc.ca/eng/industry-markets-and-trade/international-agri-food-market-intelligence/asia/market-intelligence/modern-grocery-retailing-in-japan/?id=1460464699419>. Accessed on 17 January 2019.

Ministry of Agriculture, Forestry and Fisheries (Japan). 2016. Retrieved from <http://www.maff.go.jp/e/policies/standard/jas/specific/organic.html>. Accessed on 12 January 2019.

Mizobuchi, K., & Takeuchi, K. 2013. The influences of financial and non-financial factors on energy-saving behaviour: A field experiment in Japan, *Energy Policy*, 63: 775-787.

Mont, O., Dalhammar, C., & Jacobsson, N. 2006. A new business model for baby prams based on leasing and product remanufacturing, *Journal of Cleaner Production*, 14: 1509-1518.

Morgan, D. L. 2007. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of mixed methods research*, 1(1): 48-76.

- Moser, A.K. 2016. Consumers' purchasing decisions regarding environmentally friendly products: An empirical analysis of German consumers, *Journal of Retailing and Consumer Services*, 31: 389-397.
- Mota-Babiloni, A., Navarro-Esbrí, J., Barragan-Cervera, A., Moles, F., Peris, B., & Verdu, G. 2015. Commercial refrigeration: An overview of current status, *International Journal of Refrigeration*, 57: 186-196.
- MSC (Marine Stewardship Council). 2017. The MSC at 20. Wild. Certified. Sustainable. Annual Report 2016 – 17. Marine Stewardship Council, London: UK.
- Mylona, Z., Kolokotroni, M., & Tassou, S.A. 2017. Frozen food retail: Measuring and modelling energy use and space environmental systems in an operational supermarket, *Energy and Buildings*, 144: 129-143.
- Naidoo, M., & Gasparatos, A. 2018. Corporate Environmental Sustainability in the retail sector: Drivers, strategies and performance measurement. *Journal of Cleaner Production*, 203: 125-142.
- NCSS Statistical Software. 2019. Chapter 425. Principal Components Analysis. Retrieved from <https://www.ncss.com/software/ncss/ncss-documentation/>. Accessed on 12 January 2019.
- Ochieng, E.G., Jones, N., Price, A.D.F., Ruan, X., Egbu, C.O., & Zuofa, T. 2014. Integration of energy efficient technologies in UK supermarkets, *Energy Policy*, 67: 388–393.
- Ogunbode, C. A. 2013. The NEP scale: measuring ecological attitudes/worldviews in an African context. *Environment, development and sustainability*, 15(6): 1477-1494.
- Orsato, R.J. 2006. Competitive Environmental Strategies: When does it pay to be green? *California Management Review*, 48 (2): 127-143.
- Padel, S., & Foster, C. 2005. Exploring the gap between attitudes and behaviour: Understanding why consumers buy or do not buy organic food, *British food journal*, 107(8): 606-625.
- Pedersen, E.R. 2010. Modelling CSR: How managers understand the responsibilities of business towards society, *Journal of Business Ethics*, 91(2): 155-166.
- Pick n Pay Group. 2016. Sustainable Living Report 2016. Pick n Pay Group, South Africa.
- Raimondo, D., Bassu, A., Corgnati, S.P., & Trifirò, A. 2015. Energy consumption and thermal comfort assessment in retail stores: Monitoring and dynamic simulation applied to a case study in Turin, *Energy Procedia*, 78: 1015 -1020.
- Ramanathan, U., Bentley, Y., & Pang, G. 2014. The role of collaboration in the UK green supply chains: An exploratory study of the perspectives of suppliers, logistics and retailers, *Journal of Cleaner Production*, 70: 231-241.
- Reyna, C., Bressán, E., Mola, D., Belaus, A., & Ortiz, M. V. 2018. Validating the Structure of the New Ecological Paradigm Scale among Argentine Citizens through Different Approaches, *Pensamiento Psicológico*, 16(1): 107-118.
- RFS (Retail Forum for Sustainability). 2018. Sustainable Water Management. Issue Paper No. 12. European Commission, Brussels: Belgium.

Richmond, R., & Simpson, R. 2016. Towards quantifying energy saving strategies in big-box retail stores: A case study in Ontario (Canada), *Sustainable Cities and Society*, 20: 61–70.

Rideout, B. E., Hushen, K., McGinty, D., Perkins, S., & Tate, J. 2005. Endorsement of the new ecological paradigm in systematic and e-mail samples of college students. *The Journal of Environmental Education*, 36(2): 15-23.

Ridoutt, B.G., Juliano, P., Sanguansri, P., & Sellahewa, J., 2010. The water footprint of food waste: Case study of fresh mango in Australia, *Journal of Cleaner Production*, 18: 1714-1721.

Roberts, J. A., & Bacon, D. R. 1997. Exploring the subtle relationships between environmental concern and ecologically conscious consumer behavior, *Journal of business research*, 40(1): 79-89.

Roca, L.C., & Searcy, C. 2012. An analysis of indicators disclosed in corporate sustainability reports, *Journal of Cleaner Production*, 20: 103-118.

RSPO (Roundtable on Sustainable Palm Oil). 2017. Impact Update 2017. Roundtable on Sustainable Palm Oil, Geneva: Switzerland.

RTRS (Roundtable on Responsible Soy). 2014. All UK Retailers Support RTRS. Retrieved from <http://www.responsiblesoy.org/la-totalidad-de-los-retailers-del-reino-unido-apoyan-a-la-rtrs/?lang=en>. Accessed on 17 December 2017.

Saha, M., & Darnton, G. 2005. Green companies or green conpanies: Are companies really green, or are they pretending to be?, *Business and Society Review*, 110(2): 117–157.

Sainsbury's Ltd. 2017. Waste. Retrieved from <https://www.about.sainsburys.co.uk/making-a-difference/environment/waste>. Accessed on 13 December 2017.

Saldana, J. (2012). *The coding manual for qualitative research*, Thousand Oak.

Searcy, C. 2012. Corporate sustainability performance measurement systems: A review and research agenda, *Journal of Business Ethics*, 107: 239–253.

Searcy, C., & Elkhawas, D. 2012. Corporate sustainability ratings: an investigation into how corporations use the Dow Jones Sustainability Index, *Journal of Cleaner Production*, 35: 79-92.

Seven & i Holdings Co., Ltd. 2016. Integrated Report 2016. Seven & i Holdings Co., Ltd, Japan.

Shoprite Holdings Ltd. 2016 Sustainability Report 2016. Shoprite Holdings Ltd, South Africa.

Siegel, A., Badiane, K., & McElrath, R. 2012. Retail Employee Engagement for Sustainability. Retail Industry Leaders Association, Arlington: USA.

Skouloudis, A., & Evangelinos, K.I. 2009. Sustainability reporting in Greece: Are we there yet? *Environmental Quality Management*, 19(1): 43-60.

Smith, E. E., & Perks, S. 2010. A perceptual study of the impact of green practice implementation on business functions, *Southern African Business Review*, 14(3): 1-29.

Smith M. 2018. SA lags behind as move to electric cars gathers pace. Business Day. Retrieved from <https://www.businesslive.co.za/bd/business-and-economy/2018-06-28-sa-lags-behind-as-move-to-electric-cars-gathers-pace/>. Accessed on 14 November 2018.

Spar Group Ltd. 2016. Integrated Report 2016. Spar Group Ltd, South Africa.

Spicer, A., & Hyatt, D. 2017. Walmart's emergent low-cost sustainable product strategy, *California Management Review*, 59(2): 116-141.

Srivastava, S.K. 2007. Green supply-chain management: A state-of-the-art literature review, *International Journal of Management Reviews*, 9(1): 53–80.

Statistica, 2018. Average annual income of households in Japan from 2009 to 2017 (in million Japanese yen). Retrieved from <https://www.statista.com/statistics/856609/japan-average-annual-income-household/>. Accessed on 12 January 2019.

Statistics Japan. 2016. News Bulletin December 27, 2016. Retrieved from <https://www.stat.go.jp/english/info/news/20161227.html>. Accessed on 3 October 2018.

Statistics Japan. 2018. Population Density. Retrieved from <https://stats-japan.com/t/kiji/13400>. Accessed on 21 November 2017.

Statistics South Africa. 2013. National Household Travel Survey. Statistical release P0320, Statistics South Africa: Pretoria, South Africa.

Statistics South Africa. 2017. Mid-year population estimates. Retrieved from <https://www.statssa.gov.za/publications/P0302/P03022017.pdf>. Accessed on 25 October 2018.

Statistics South Africa. 2018. Only 10% of waste recycled in South Africa. Retrieved from <http://www.statssa.gov.za/?p=11527>. Accessed on 12 January 2019.

Steger, U. 2000. Environmental management systems: Empirical evidence and further perspectives, *European Management Journal*, 18(1): 23–37.

Styles, D., Schoenberger, H., & Galvez-Martos, J.L. 2012. Environmental improvement of product supply chains: A review of European retailers' performance, *Resources, Conservation and Recycling*, 65: 57–78.

Tang, A.K.Y., Kee-hung, L., & Cheng T.C.E. 2016. A multi-research-method approach to studying environmental sustainability in retail operations, *International Journal of Production Economics*, 171: 394–404.

Taufique, K.M.R., Siwar, C., Chamhuri, N., & Sarah, F.H. 2016. Integrating general environmental knowledge and eco-label knowledge in understanding ecologically conscious consumer behavior, *Procedia Economics and Finance*, 37: 39–45.

TEEB (The Economics of Ecosystems and Biodiversity). 2012. The Economics of Ecosystems and Biodiversity in Business and Enterprise. Earthscan: London and New York.

The Straits Times. 2018. Recycling plastic in packaging obsessed Japan. Retrieved from <https://www.straitstimes.com/asia/east-asia/recycling-plastic-in-packaging-obsessed-japan-style>. Accessed on 25 September 2018.

Ubeda, S., Arcelus, F.J., & Faulin, J. 2011. Green logistics at Eroski: A case study, *International Journal of Production Economics*, 131: 44–51.

United Nations. 2015. Global Sustainable Development Report. Division for Sustainable Development, Department of Economic and Social Affairs, New York: USA.

United Nations. 2017. Business. Retrieved from <http://www.un.org/en/sections/resources-different-audiences/business/>. Accessed on 27 September 2017.

United Nations. 2018. SDG Indicators. Metadata Repository. United Nations Statistics Division, Department of Economic and Social Affairs. Retrieved from <https://unstats.un.org/sdgs/metadata/>. Accessed on 14 August 2017.

UNDP (United Nations Development Programme). 2017. Solutions for Sustainable Development. Green Bonds. Retrieved from <http://www.undp.org/content/sdfinance/en/home/solutions/green-bonds.html>. Accessed on 5 November 2017.

UNEP (United Nations Environment Programme). 2012a. Global Outlook on Sustainable Consumption and Production Policies. Taking action together. United Nations Environment Programme, Nairobi: Kenya.

UNEP (United Nations Environment Programme). 2012b. Measuring water use in a green economy, A Report of the Working Group on Water Efficiency to the International Resource Panel. United Nations Environment Programme, Nairobi: Kenya.

UNEP. 2013. Green Economy Scoping Study: South African Green Economy Modelling Report (SAGEM): Focus on Natural Resource Management, Agriculture, Transport and Energy Sectors. United Nations Environment Programme: Nairobi.

UNEP (United Nations Environment Programme). 2015. Sustainable Consumption and Production. A handbook for policy makers. Global Edition. United Nations Environment Programme, Nairobi: Kenya.

UNGC (United Nations Global Compact). 2014. Guide to Corporate Sustainability. Shaping a Sustainable Future. United Nations Global Compact, New York: USA.

Wang, J., Zhuang, H., & Lin, P.C. 2016. The environmental impact of distribution to retail channels: A case study on packaged beverages, *Transportation Research Part D: Transport and Environment*, 43: 17-27.

Wilhelm-Rechmann, A., Cowling, R. M., & Difford, M. 2014. Responses of South African land-use planning stakeholders to the New Ecological Paradigm and the Inclusion of Nature in Self scales: Assessment of their potential as components of social assessments for conservation projects, *Biological conservation*, 180: 206-213.

Williams, H., & Wikström, F. 2011. Environmental impact of packaging and food losses in a life cycle perspective: A comparative analysis of five food items, *Journal of Cleaner Production*, 19(1): 43-48.

Wood, D., & Grace, K. 2011. A Brief Note on the Global Green Bond Market. IRI Working Paper. Initiative for Responsible Investment, Harvard University, Cambridge: USA.

Woolworths Holdings Limited. 2016. 2016 Good Business Journey Report. Woolworths Holdings Limited, Cape Town: South Africa.

Woolworths Holdings Limited. 2017. 2017 Good Business Journey Report. Woolworths Holdings Limited, Cape Town: South Africa.

World Wildlife Fund (WWF). 2017. Retrieved from <http://www.wwf.org.za/?21962/The-truth-about-our-food-waste-problem>. Accessed on 12 January 2019.

Yaremko, R. M., Harari, H., Harrison, R. C., & Lynn, E. 1986. Handbook of research and quantitative methods in psychology: For students and professionals, Lawrence Erlbaum Associates: Hillsdale, New Jersey.

Young, W., Hwang, K., McDonald, S., & Oates, C. J. 2010. Sustainable consumption: green consumer behaviour when purchasing products, *Sustainable development*, 18(1): 20-31.

Yu, Y., Hubacek, K., Feng, K., & Guan, D. 2010. Assessing regional and global water footprints for the UK, *Ecological Economics*, 69: 1140-1147.

Zaatari, M., Novoselac, A., & Siegel, J. 2016. Impact of ventilation and filtration strategies on energy consumption and exposures in retail stores, *Building and Environment*, 100: 186-196.

Zhu, Q., & Sarkis, J. 2016. Green marketing and consumerism as social change in China: Analyzing the literature, *International Journal of Production Economics*, 181: 289–302.