

Review Article

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A comparative review of Australia's fashion and textile industry and global climate perspectives across five decades (1970s–2020s)

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Abstract

Non-Technical Summary. This paper reviews the evolution of the Australian fashion and textile industry over the last 50 years as it confronts the challenges of climate change. Given Australia's susceptibility to trade policies and shifting regulations, the industry needs to adapt to climate pressures, given its significant resource consumption and waste production. This analysis highlights key events that shaped the trading landscape, regulatory changes, and the need for stronger climate policies that bridge environmental responsibility between local and global actors, aiming to reduce the industry's impact on climate change.

Technical Summary. This review examines the Australian fashion and textile industry's response to climate change from the 1970s to the 2020s, using a methodology adapted from Harvard University comparative review guidelines and incorporating PRISMA. With evolving trade policies and regulatory shifts, this paper highlights the industry's environmental challenges. This analysis examines the influence of local and international trade regulations and the effectiveness of climate policies in fostering sustainability. Key policy insights include the integration of climate considerations into trade policies to address the environmental impacts of international transactions, aligning trade with global climate goals. Additionally, it advocates for mandatory climate disclosures encompassing onshore and offshore emissions to enhance transparency across the supply chain. This paper calls for stronger alignment between climate and trade policies and expanded producer responsibility, holding both domestic and international actors accountable for environmental impacts.

Social Media Summary. Reviewing 50 years of Australia's fashion and textile industry as it adapts to climate pressures & policy shifts.

1. Introduction

The fashion and textile industry, contributing around 8% of global greenhouse gas (GHG) emissions (McCallion et al., 2021; Stallard, 2022), and if trends continue, these emissions could increase by over 50% by 2030 (Berg et al., 2020; WorldBank, 2019). Heavy water consumption and rapid production have led to concerns about water scarcity, pollution, and waste generation, including harmful microplastics (Badhwar et al., 2024). In response, the industry is adopting sustainable practices, aligning with the Sustainable Development Goals (SDGs) to reduce emissions, promote eco-friendly materials, minimise waste, ensure supply chain transparency, and foster eco-conscious consumer behaviour (Gardetti & Muthu, 2020; John & Mishra, 2023).

This paper generally refers to the 'fashion and textile industry', using the term 'Textile and Clothing (T&C) industry', which is more commonly found in Australian government documentation. To maintain consistency with regulatory language, the term T&C is primarily used throughout, with occasional reference to TCF (Textile, Clothing, and Footwear) where appropriate. A fashion garment is produced through an interconnected chain of industries, from fibre production, textile production, cut, make, and trim, to distribution, retail, use, and then disposal. The United Nations Environment Programme (UNEP) recommends taking a value chain approach to examine the hot spots for GHG emissions (UNEP, 2020) across this chain of industries (UNEP, 2023). United Nations Climate Change (UNCC) has launched a climate action program, Fashion Industry Charter for Climate Action, to unify T&C industry stakeholders, from raw material producers to brands, in developing a cohesive climate strategy (UNCC, 2018).

Based on the Paris Agreement, the GHG Protocol classifies emissions into three scopes: Scope 1 for direct emissions from owned sources, Scope 2 for indirect emissions from purchased energy, and Scope 3 for other indirect emissions across a company's value chain (WRI, 2024a). The Fashion Industry Charter for Climate Action aims to achieve net-zero emissions

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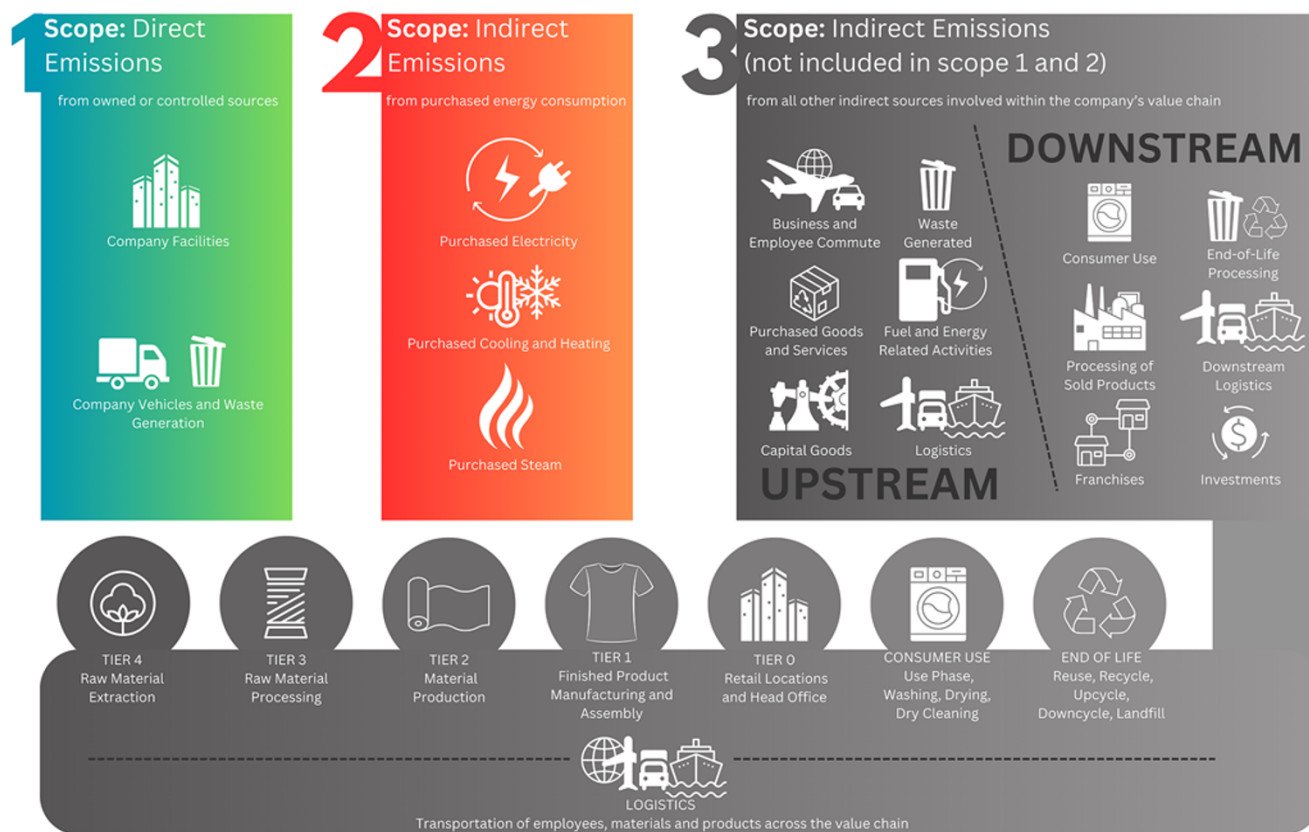


Figure 1. Overview of GHG Protocol scopes and emissions across the T&C value chain (Christopher, 2022; WRI, 2024a).

by 2050. Initially, the Charter set a target of 30% emissions reduction by 2030, but at COP 26 in 2021, signatories committed to Science-Based Targets (WRI, 2024b), halving emissions by 2030 (UNCC, 2023). The World Resources Institute's (2021) report estimated fashion sector emissions at 1.025 Gt CO₂e in 2019, projected to rise to 1.588 Gt by 2030, missing the 45% reduction target (Sadowski et al., 2021). A progress report developed by UNCC (2023) showed increased compliance with the Charter's reporting requirements, yet Scope 3 emissions, driven by high production volumes, remain a significant challenge.

The F&T industry faces growing scrutiny for its environmental impact, with a focus often on direct, Scope 1, and energy-related, Scope 2 emissions. However, Scope 3 emissions, which include indirect emissions from a company's entire value chain, upstream and downstream, are less reported but highly significant to fully understand the industry's environmental footprint (UNCC, 2023). The T&C industry, with its complex global supply chains (Macchion, 2024), sees most of its emissions falling under Scope 3 (Christopher, 2022). Collaboration across the value chain varies, with some stakeholders not sharing information or providing misinformation (Badhwar et al., 2024). Despite these challenges, accurately measuring indirect emissions is crucial for brands seeking to address their environmental impact effectively.

Scope 3 is often the largest source of emissions for fashion brands and retailers, with longer supply chains contributing to higher emissions at each stage (UNEP, 2023). It consists of categories, with relevant key areas for source of emissions in fashion supply chains including, emissions from garment, trims, accessories, and packaging manufacturing facilities; upstream emissions

from raw material extraction and production, which vary by material (e.g., cotton, polyester, viscose); transportation of goods; and the use and disposal of garments by consumers (Sadowski et al., 2021). The drive to keep manufacturing costs low leads to tiered operations (as shown in Figure 1) in the T&C industry, often involving undeclared stakeholders (Badhwar et al., 2023). This complexity makes tracking data and reporting Scope 3 emissions particularly challenging.

This research aims to explore the complex relationship between trade laws, T&C industry trends, and climate change indicators, with a specific focus on Australia. By conducting a comparative analysis of environmental protection measures and climate change responses within the context of global and Australian trade trends in the TCF sector, which will be referred to as the T&C sector in this study. This analysis seeks to provide a comprehensive understanding of these interconnected factors. Covering pivotal events from the 1970s to the present, the research will examine the impact of trade regulations on the T&C industry and the role of climate laws in promoting sustainable practices.

2. Method and data sources

The methodology adapted for conducting this comparative analysis originates from the guidelines established by Harvard University (Walk, 1998). It entails a meticulous and systematic approach, consisting of five discerning steps as illustrated in Figure 2. These steps serve as the critical steps of the analysis, ensuring rigour and objectivity throughout.

The method begins with establishing a clear frame of reference for comparison, focusing on the evolution of the global and

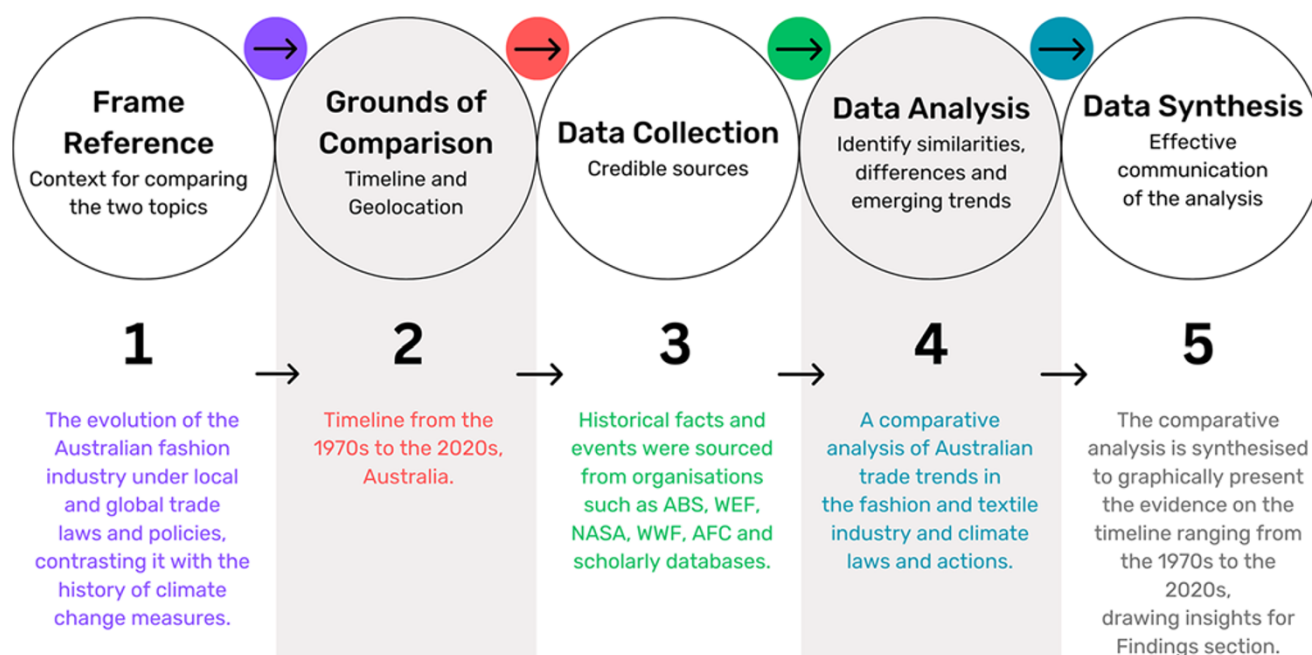


Figure 2. The five systematic steps adapted from Harvard University (Walk, 1998) for comprehensive comparative analysis.

Australian fashion industries and their intersection with climate change mitigation efforts spanning from the 1970s to the 2020s. This timeline was chosen due to significant events such as the Third Industrial Revolution, advancements in automation and computing, the fight for women's equality, the first Earth Day, and the establishment of environmental legislation and regulatory agencies like the Environmental Protection Agency. In Australia, the end of the Vietnam War and liberalisation of immigration policies also had a significant impact on the economy and industrial landscape, including the T&C industry.

The grounds for comparison are set by identifying deliberate reasons for choosing these subjects, with data collected from various credible sources, including scholarly databases such as Google Scholar, ProQuest, and Emerald, together with organisational databases such as the World Trade Organisation (WTO), World Bank, and NASA. The evidence gathered from the industry reports are from credible sources such as the Australian Fashion Council (AFC), McKinsey, and Deloitte Group in combination with newspapers and magazines such as *The Guardian* and *BBC*. The sources analysed in this review were chosen through a transparent selection process, utilising the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Moher et al., 2009) to enhance the review's quality. The keywords investigated in this review are: Australian Fashion Industry, Textile and Clothing Production, Trade Policy, Climate Change, Climate Policy, Climate Crisis, using Boolean Syntax to retrieve the most relevant work. The inclusion and exclusion criteria, based on factors like relevance, source type, and language, leading to the short-listing of 392 sources, which were further refined to select 148 sources based on their significance by analysing the abstract or summary, as summarised in Figure 3, with the distribution of source types shown in Figure 4.

Figure 5 illustrates the annual distribution of sources included in the systematic review from the 1980s to the 2020s. Most of the relevant sources reviewed were published between 2014 and 2024, with the highest of 38 from 2023 alone, which established the relevance of the topic. Notably, over 74% of the utilised sources were

published from 2019 onwards, highlighting a surge in research interest in this area.

Figure 6 highlights the leading nations contributing to the research included in this comparative systematic review. Given the Australian context of the review, the majority of the sources are from Australia. The United States, Switzerland, and the United Kingdom collectively account for a 33% share of the total sources utilised in this review.

Additionally, findings in sections 3.2 and 3.4 are developed utilising quantitative databases and reports, such as Import and Export Reports from the World Bank, National Waste Report 2022, and Australian Trade Liberalisation Report by the Australian Government. This ensures a comprehensive and reliable analysis of global and Australian trade trends within the T&C industry, paralleled by an examination of the evolution of global and Australian climate laws and actions taken to combat climate change. The rigorous analysis of these databases and associated scholarly resources identifies similarities, differences, and trends, grounded within recorded indications of global warming from the 1970s to the 2020s. The final step synthesises the analysis into an evidence-based argument, providing the basis for conclusions and insights about the intersection of the T&C industry and climate change mitigation efforts.

3. Findings

3.1. Evolution of the global and Australian textile and clothing industry: trade policies and laws

The T&C industry has been enmeshed in global trade for hundreds of years; however, the post-World War II era saw shifts to trade policies that enabled global trade to accelerate (Oladejo, 2022). The General Agreement on Tariffs and Trade (GATT), established in 1948, aimed at stimulating the post-WWII global economy by reducing tariffs and quotas (Goldstein & Gulotty, 2022). However, the 1961 Short-Term Arrangement

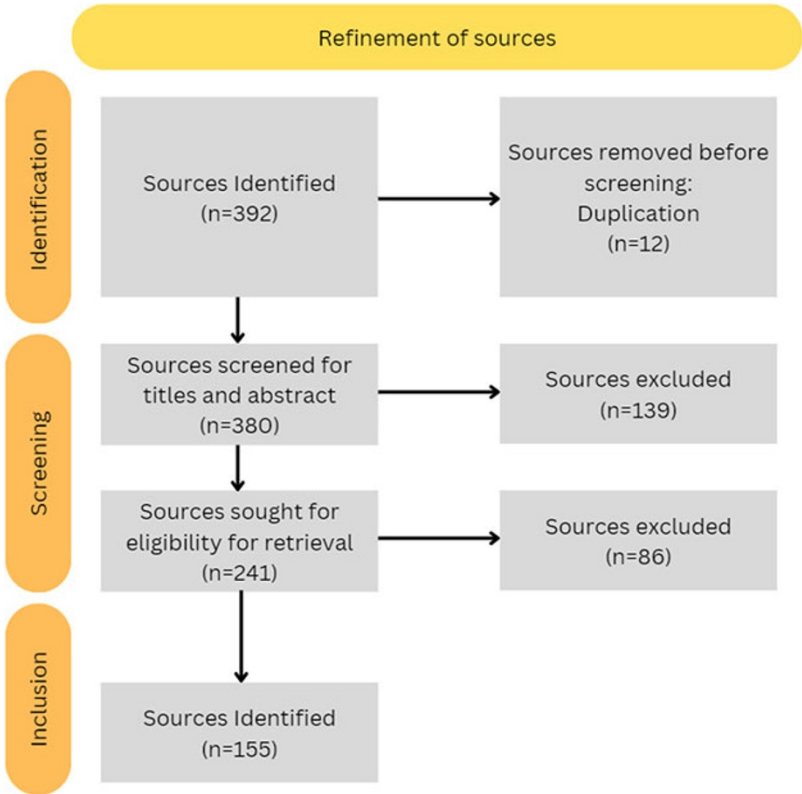


Figure 3. Refinement process based on PRISMA guideline (Moher et al., 2009).

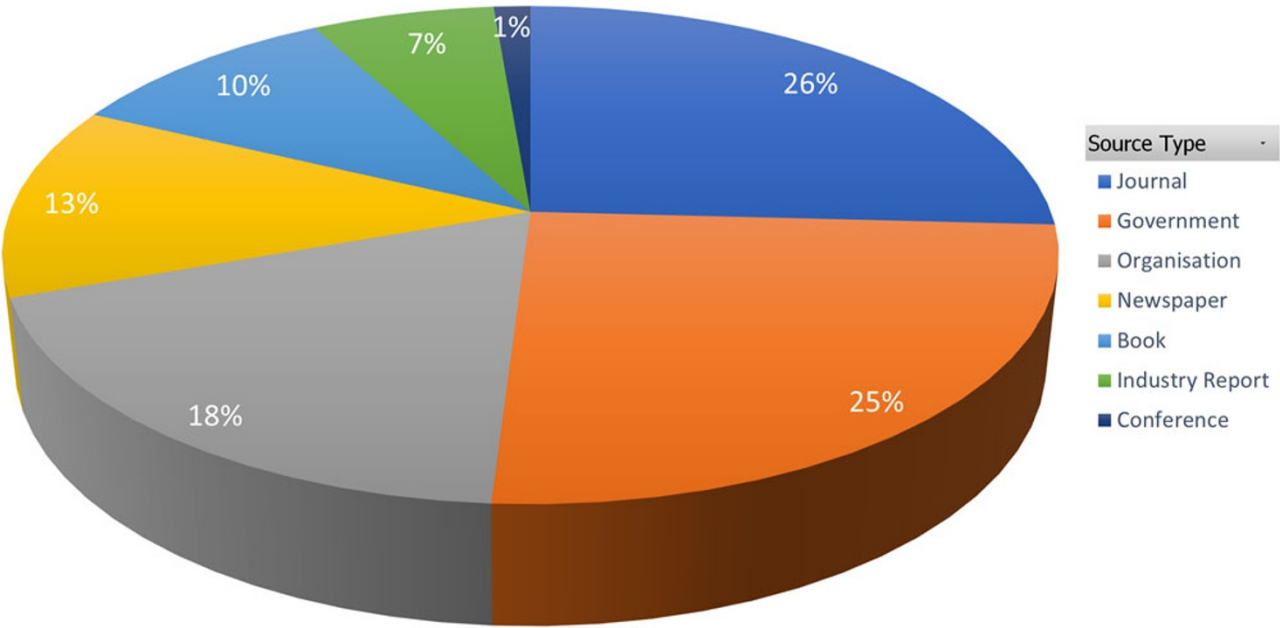


Figure 4. Distribution of sources utilised in the review.

contradicted GATT’s principles by imposing quotas on cotton-based textiles and clothing (Cable, 1987; Francois & Spinanger, 2004). The 1974 Multifibre Agreement (MFA) marked a shift, introducing a framework for outsourcing clothing from lower-wage countries (Majmudar, 1988). Despite controversy, it was renewed in 1977, 1981, and 1986 (Burris, 2015; WTO, 2023). In Australia, the 1970s marked a significant period. Post-Vietnam war, Australia

welcomed immigrants, many of whom significantly contributed to the country’s economic growth (Johnson et al., 2021). Australia had a significant stake in the TCF industry’s manufacturing sector in the early 1970s (Weller, 2007). The 1980s saw the adoption of liberal trade policies, notably the TCF Plan in 1986, which enhanced Australia’s export capabilities and removed textile import quotas (Grinberg, 2023). Meanwhile, immigration continued to rise, and in 1987, wage assessments were linked to



Figure 5. Yearly distribution of the sources utilised in the review.

skill levels rather than industry-based criteria (Truett & Truett, 2021).

The Textile Clothing and Footwear Development Authority was established in 1988, focusing primarily on textiles (Parliament Australia, 1999). This regulatory body instigated a transformative period, leading to the reorganisation and eventual closure of smaller textile businesses (Commonwealth Australia, 1990). The emergence of Asian countries as major exporters prompted the government, employers, and unions to adopt more flexible production models, largely based on offshoring strategies.

The late 1980s observed the rise of the Just-in-Time model (Nealon, 2012), with industry leaders like Pacific Brands significantly restructuring their supply chains to support offshore operations (Weller, 2007). By the 1990s, the supply chain landscape had significantly transformed. In 1991, the Agreement on Textiles and Clothing (ATC) was proposed with an objective of phasing out the MFA and abolishing global quotas over a decade (WTO, 2023). The Hidden Cost of Fashion Report in 1995 highlighted the extensive impact of these changes, estimating that over 300,000 overseas workers were involved in the Australian TCF industry (TCFUA, 1995). While these shifts were shaping Australia's TCF industry drastically, on the global stage WTO was being established in 1995, bringing the ATC into effect, leading to an increase in textile imports (Manoj & Muraleedharan, 2019). The ATC was renewed in 1998 and 2002, each time raising import limits. By 2005, all restrictions were lifted, marking the end of a complex process (WTO, 2023).

In 2008, the global economic recession led to the consolidation of major importers and a decrease in the influence of smaller ones (Burris, 2015). To counter the post-recession slowdown in exports and imports (2010–2016), numerous global and national policies were introduced in the 2010s to reduce trade barriers and foster economic growth (Georgieva et al., 2018). These changes, which began before the 1970s but accelerated during that period, reshaped the T&C industry. Trade agreements and policies incentivising manufacturing offshore, primarily due to minimum wage

differences between importing and exporting countries, were central to this transformation.

Figure 7 illustrates the benchmark trade policies and events to draw a comparative timeline with the evolution of the Australian T&C industry.

The early 2000s saw the WTO remove trade restrictions in 2005, significantly impacting Australia as a member nation (Pomfret, 2019). The height of manufacturing outsourcing coincided with the 2008 global recession, leading to reduced consumer spending and a decreased demand for Australian exports (RBA, 2011). By the end of the 2000s, fashion and clothing retailers outnumbered manufacturers in Australia. In the following decade, Australia experienced the entry of international retail brands such as Zara, Uniqlo, and H&M into the fashion marketplace, while Australian fashion designers and retailers pursued global expansion (Singer, 2019; Tonti & Gorman, 2023).

The 2013 Rana Plaza Incident exposed the exploitative practices and poor conditions within the T&C industry, sparking sustainability and ethical fashion movements (Saxena, 2020). Australia reflected these global trends, with sustainability, slow fashion, and recycled fashion becoming key themes. The concept of greenwashing became prevalent as brands capitalised on the growing demand for sustainable fashion. The 2010s also initiated the rise of Circular Economy principles, aimed at mitigating environmental impact across industries, including fashion (EllenMacarthurFoundation, 2019; Payne, 2015).

In line with global shifts, Australia has called for significant changes in the manufacturing and consumption of TCF products into the 2020s (Lee & Weder, 2021). This focus on sustainable consumption led the Australian Competition and Consumer Commission (ACCC) to take initial action against retailers, including those in the T&C sector, accused of greenwashing (ACCC, 2023). Australia has recently implemented a product stewardship strategy to address the environmental and health impacts of various products throughout their life cycle (DCCEEW, 2023c;

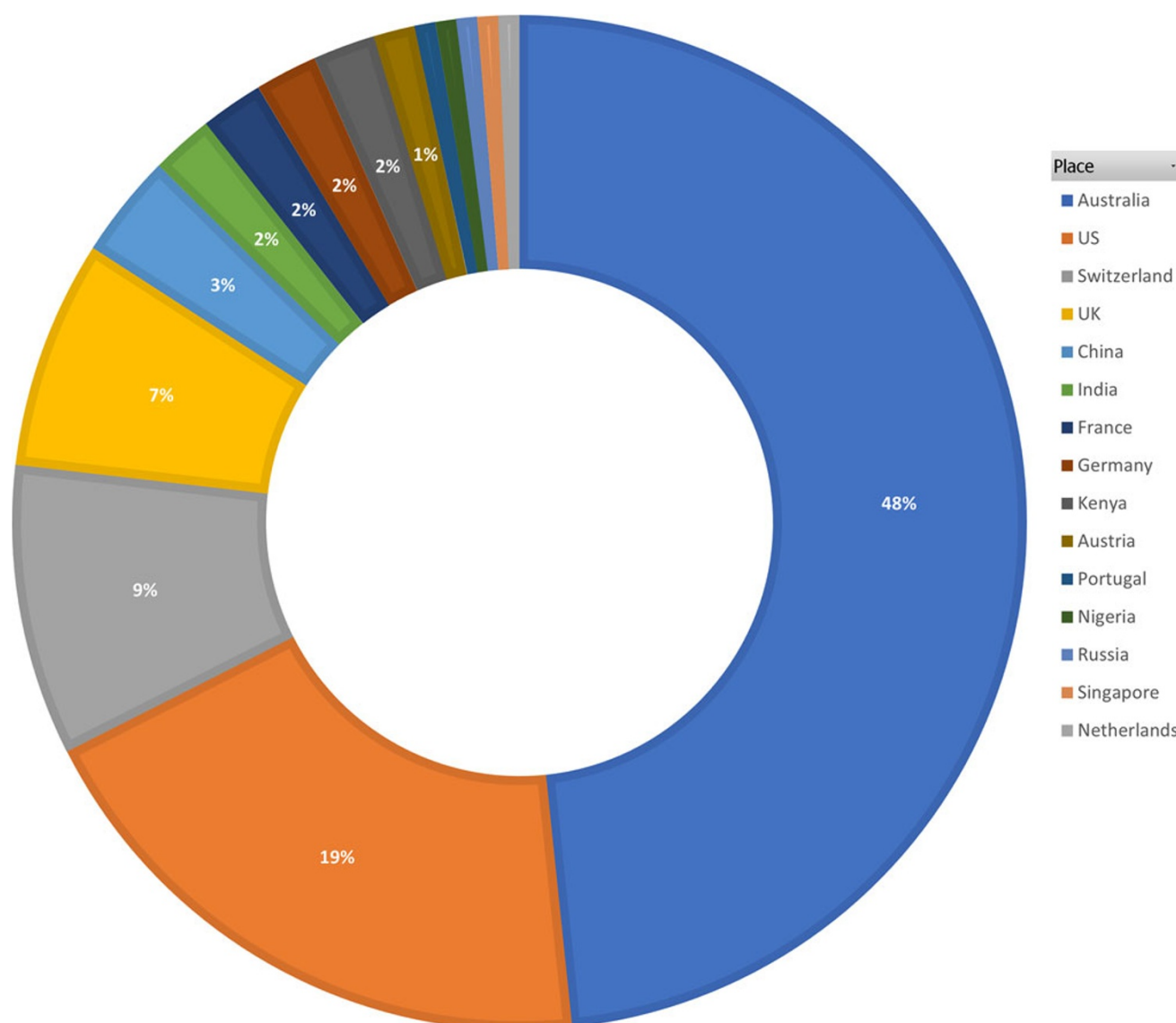


Figure 6. Distribution of refined articles based on the geographical location.

Payne & Mellick, 2022). The Australian T&C industry has actively engaged in the national clothing product stewardship scheme, Seamless, aligning with the roadmap for achieving circularity in clothing (Allan et al., 2023; Retamal et al., 2023).

In August 2024, the Senate passed the Treasury Laws Amendment Bill 2024, requiring organisations to include mandatory climate-related financial disclosures in their annual reports starting from financial year after 1 January 2025. These detailed reporting requirements are likely to drive emissions reduction through strategic initiatives (TLA, 2024). This represents one of the most significant changes in corporate reporting in decades, with companies expected to disclose climate risks and opportunities affecting their business in the short, medium, and long term (Streng et al., 2024).

The factors highlighted in this section, such as the parallelism between the shifts in global trade policies and the evolution of Australian trade policies, reflect the broader dynamics. It has an impact on the Australian T&C industry, particularly in relation to the industry's environmental footprint within and outside the

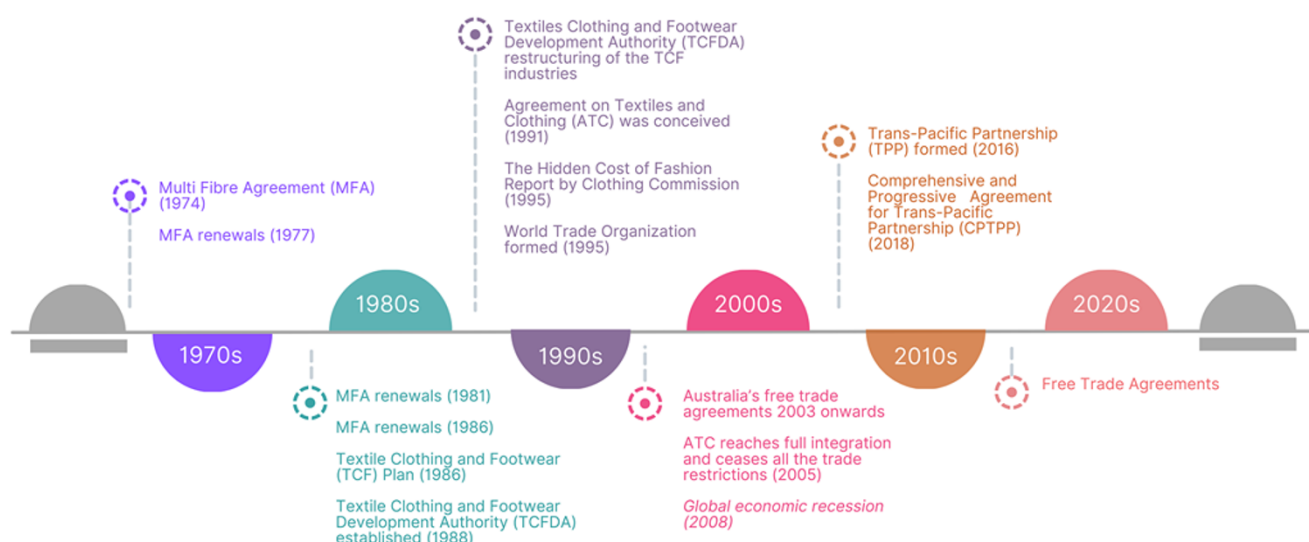
nation's boundaries and its connection to climate change, as established in the following sections.

3.2. Evolution of global and Australian fashion and clothing consumption trends

Over the past five decades, consumption patterns in the T&C sector have significantly shifted due to industry restructuring (Bramble & Kuhn, 2019). Textile fibre production grew by over 400% from the 1970s to the 2020s (Statista, 2023), with offshoring and outsourcing in the 1980s and 1990s leading to a 3.6% increase in Asian textile fibre production (ILO, 1996).

The 2000s saw a big surge in clothing production, with output doubling over two decades to 100 billion items annually by the 2020s (Remy et al., 2016; WorldBank, 2019). However, 33% of these garments ended up in landfills within a year of purchase (McCallion et al., 2021), and despite increased production, actual garment utilisation decreased by nearly 50% (Igini, 2023). From

Trade Laws and Policies



Evolution of the Australian Fashion and Textile Industry

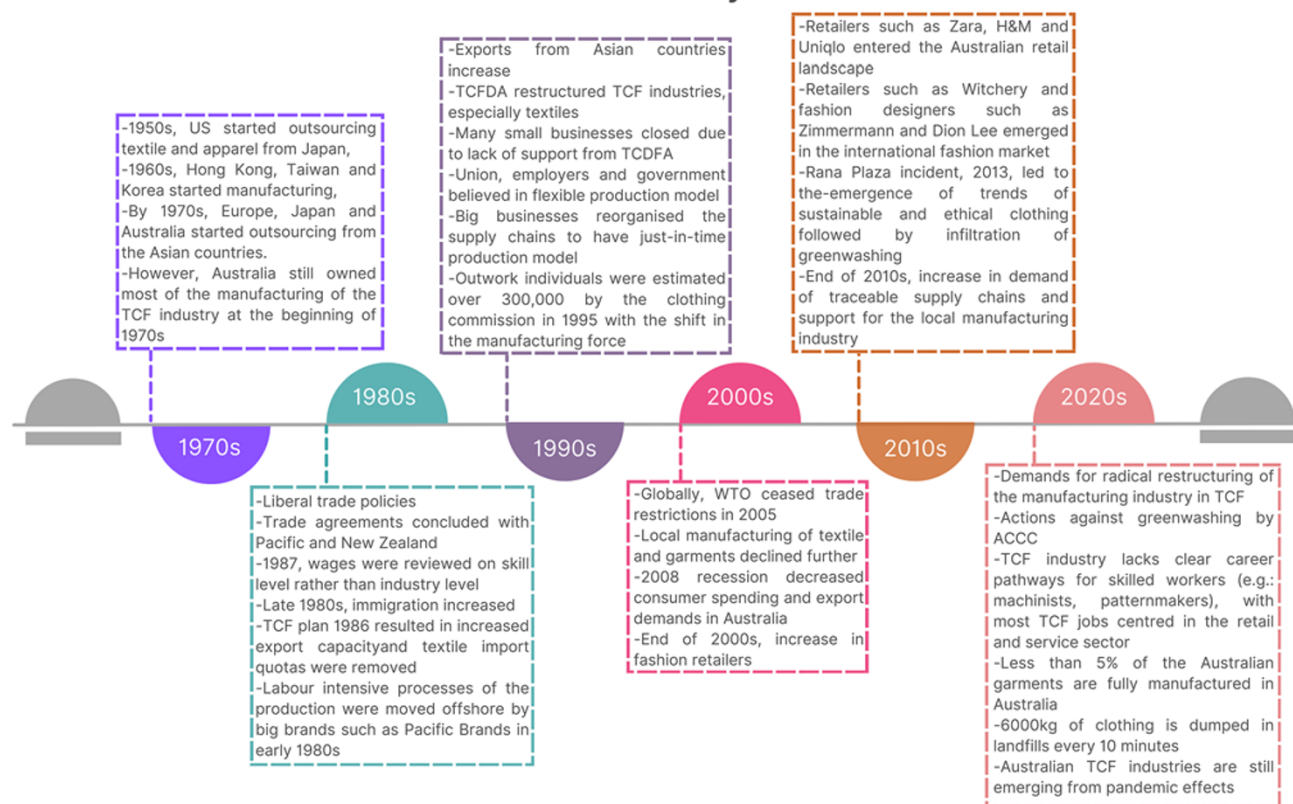


Figure 7. Comparative timeline of the significant trade policies and evolution of the Australian T&C Industry during 1970s–2020s.

the 2010s, the T&C industry's environmental footprint expanded significantly, with high resource consumption, including water and land (Nature, 2018; Pardo Martínez & Cotte Poveda, 2022). The T&C industry also contributes to a substantial amount of global

industrial water pollution and microplastic pollution (Mogavero, 2020).

In Australia, household consumption expenditure has risen from less than AUD 2000 annually in the 1970s to over AUD 15,000

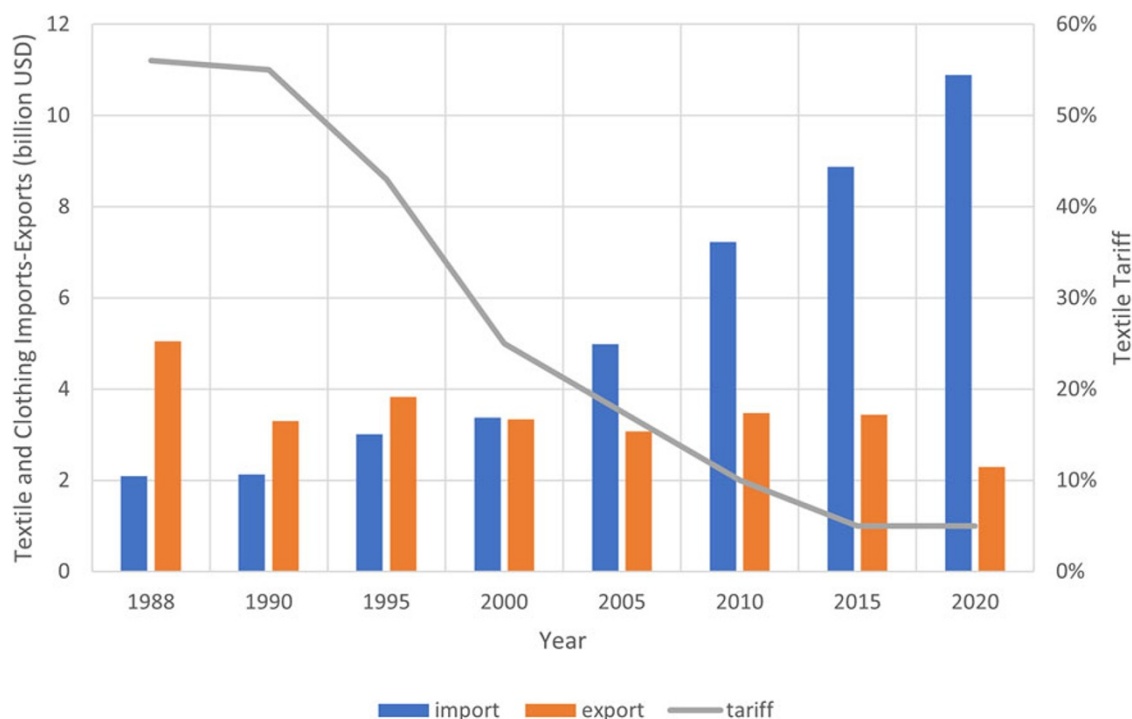


Figure 8. Decline in textile tariff (%) from 1988 to 2020 (CIE, 2017) in proportion to Australia's T&C product import and export value (USD) (WITS, 2024a, 2024b).

in the 2020s (CEIC, 2023). Australians buy around 14.8 kg of clothing per year but discard 15 kg, resulting in a net increase in clothing waste. Despite 210,000 tonnes of clothing being donated annually, a significant amount of textile waste ends up in landfills, with 6,000 kg of T&C discarded every ten minutes (DCCEEW, 2023b). TextileExchange (2024) reported that virgin synthetic fibre production rose from 67 to 75 million tonnes between 2022 and 2023, with polyester comprising 57% of global fibre output. Recycled polyester's market share fell from 13.6% to 12.5%, despite increased production, due to cheaper virgin synthetics and recycling limitations. Recycled textiles account for less than 1% of the global fibre market (TextileExchange, 2024).

Since the late 1980s, Australia's T&C sector has witnessed a gradual reduction in tariffs, driving increased imports. This policy, while promoting consumer choice and international trade, led to the relocation of manufacturing processes offshore, weakening domestic production (CIE, 2017). Consequently, Australia's T&C exports have shifted towards raw materials such as cotton and wool (Anderson, 2014). However, these exports now fall short of total imports in the sector (WITS, 2024). This trend reflects the diminishing local manufacturing capacity and the sector's reliance on global sourcing and supply chains. Analysing the data on export, import, and tariff in the Australian T&C product category from the World Bank (WITS, 2024b) and Australian trade liberalisation Final Report (CIE, 2017) reveals a clear correlation: tariff reduction correlates with import growth and a decline in T&C exports. The growth of imports during 2015–2020, even after tariffs had stabilised, indicates the structural expansion of garment volumes in the Australian market. Figure 8 features these trends, highlighting the sector's evolving dynamics.

The continuous increase in imports and the impacts of overconsumption of the TCF items resulted in a collaborative effort led by the AFC initiated the development of Australia's first National Clothing Product Stewardship Scheme in 2021. The Clothing Data

Report, a foundational element of this scheme, highlighted the excessive and unsustainable nature of Australia's clothing consumption and disposal habits (Allan & Allan, 2022). The scheme aims to drive improvements in clothing design, reuse, recovery, and recycling, targeting full circularity by 2030 (Payne & Mellick, 2022). It aligns with the objectives of the National Waste Policy Action Plan and calls for the active engagement of all stakeholders to address the environmental and social impacts of clothing across its lifecycle (DCCEEW, 2023c). This initiative materialised as Seamless in 2023, a landmark stewardship program uniting brands, manufacturers, retailers, fibre producers, academics, charitable organisations, waste management providers, and governments (Allan et al., 2023).

While over 70 members currently participate in Seamless, Australia's clothing market comprises more than 16,000 brands, with just 30 responsible for the majority of product volume (Payne et al., 2022). By 2022, Australia imported 373,000 tonnes of new clothing annually and produced only 10,000 tonnes domestically. Each person consumed 56 clothing items per year, contributing to a total of 1,440,000 tonnes of clothing in use. However, 422,000 tonnes of clothing exited the usage stage to either enter a second life or disposal, including 227,000 tonnes sent to landfill, surpassing the annual influx of new clothing (Allan & Allan, 2022). By 2023, purchases per person slipped to 53, hinting at a possible shift, yet the rebound to 55 in 2024 (Seamless, 2025) shows that meaningful change has not taken hold. Encouragingly, more Australians engaged in second-hand shopping in 2023, but clothing waste remained substantial, with 222,000 tonnes sent to landfill (Seamless, 2024). In 2024, Australians purchased more new clothing than the year before, while unsold stock continued to highlight overproduction. At the same time, record numbers of Australians were selling, swapping, and sharing clothing, yet 200,000 tonnes still ended up in landfill (Seamless, 2025).

This underscores the urgent need for systemic reform across the clothing value chain. While the growth of second-hand activity points to encouraging shifts, the rebound in new purchases, rising unsold stock, and persistent landfill volumes highlight a continuing imbalance between inflows and outflows. Meaningful progress will depend on the implementation of scalable, sustainable practices alongside more responsible patterns of consumption and production.

3.3. Evolution of the global and Australian climate action plan: policies and laws

Climate action plans offer a structured framework for measuring, tracking, and reducing GHG emissions, while also facilitating climate adaptation strategies (WorldBank, 2021; Abbas et al., 2022). This section examines the global progression of climate initiatives, Australia's role in international and domestic efforts, and the level of engagement within the Australian TCF industry. A visual summary of major global and national climate milestones is provided in Figure 9, offering contextual support for the discussion that follows.

While early conversations on resource conservation began in the mid-20th century, highlighted by UNESCO conferences in 1949 and 1968 (Jundt, 2014), substantive action emerged in the 1970s. The 1972 Earth Summit (Earth Day, 2023) catalysed global environmental governance (Chow, 2020) through the establishment of UNEP and was influenced by emerging sustainability discourses (Pearson, 1985), including Maslow's interpretation linking sustainability to basic human needs (Ichendu & Budnukaeku, 2021; Gabriel and Sailer, 2023) and the influential 'Blueprint for Survival' (Huan & Huan, 2022).

Subsequent decades witnessed a growing institutional framework, including the 1979 Earth Watch Programme, the 1985 Vienna Convention, and the formal introduction of 'sustainable development' in the 1987 Brundtland Report (DeSilvey & Harrison, 2020; Shi et al., 2019). The IPCC was established in 1988, followed by the Montreal Protocol in 1989 (IPCC, 2023b). The 1990s and 2000s saw the proliferation of global climate instruments such as the UNFCCC (UN, 2007), Kyoto Protocol, and successive IPCC reports, culminating in the 2015 Paris Agreement (Falkner, 2016; Rogelj et al., 2019), an unprecedented global commitment involving 195 nations (Höhne et al., 2021). This was followed by the adoption of the UN SDGs (SDG, 2015), underpinned by the Triple Bottom Line model (Lim, 2022). More recently, the 2018 IPCC Special Report and the 2021 Sixth Assessment Report have reinforced the scientific consensus on anthropogenic climate change (Malla et al., 2022), highlighting irreversible impacts and compounding risks (Buis, 2019; IPCC, 2021a, 2021b).

As a founding member of the UN, Australia has actively contributed to global environmental initiatives and adopted national climate policies (DCCEEW, 2023a; UN, 2023). However, the level of participation by the Australian T&C industry remains uneven, indicating a need for more sector-specific alignment with climate objectives. From the 1960s to the late 1970s, environmental activism grew in Australia (Scopelianos & Philips, 2019), with organisations like the Wildlife Preservation Society of Queensland and the Australian Conservation Foundation forming. The 1971 Green Bans movement (Wicke, 2021) and the appointment of the first federal environment Minister (Manning, 2019) were significant. Mid-1970s legislations, such as the Environment

Protection (Impact of Proposals) Act 1974 and the National Parks and Wildlife Conservation Act 1975, were enacted (Englefield et al., 2019). The 1975 National Resource Management (NRM) policies (Walpole & Hadwen, 2022) and the 1983 National Conservation Strategy for Australia showed further commitment.

Australia's environmental challenges in the early 1980s, such as drought, underscored ecosystem vulnerability and the significance of community initiatives (Robin et al., 2022). The 1990s saw a conservation versus development debate (Wei et al., 2017), with 'sustainable development' proposed as a solution. Key policies and strategies introduced include the 1992 National Strategy for Ecologically Sustainable Development (NSED) (Howes, 2023), the 1999 Environmental Protection and Biodiversity Conservation (EPBC) Act, the 2001 Renewable Energy Target (RET) policy, and the 2007 National Greenhouse and Energy Reporting (NGER) Act (DoHA Australia, 2023). The 2011 Clean Energy Act (FAO, 2014), including a Carbon Pricing Mechanism aimed at reducing GHG emissions, was repealed in 2014 (Crowley, 2021). In 2017, the Climate Change Act was enacted, and various states have implemented their own climate change policies.

Australia's political history since the early 2010s has been marked by a significant intervention disrupting cross-party support for climate policy (Crowe, 2019). This includes the abandonment of the emissions component of the National Energy Guarantee, highlighting the difficulty in establishing a credible climate policy (Butler, 2017). From Prime Minister (PM) John Howard's initial dismissal of climate change to PM Malcolm Turnbull's compromise on the National Energy Guarantee, political leaders have faced internal dissension (Crabb, 2019). This struggle, characterised by missed opportunities and lasting consequences (Millmow, 2023), reflects the challenges in creating coherent climate policies (Jericho, 2023) and the enduring impact of political decisions on Australia's approach to climate change (Hudson, 2018).

Political analysts have characterised Australia's climate policy from the 2010s to the early 2020s as a 'wasted decade' due to its passive approach to addressing climate change (Taylor, 2019). In 2023, under PM Anthony Albanese, the Australian government passed an emissions reduction bill to support Labour's 2030 target to reduce GHG emissions (Vinall, 2023). This target aligns with the global objective of limiting temperature rise to well below 2 degrees Celsius, with efforts to keep it under 1.5 degrees Celsius above preindustrial levels, as recommended by the IPCC (IPCC, 2018). The IPCC stresses the need for rapid emission reductions to achieve this goal (IPCC, 2023a). However, Australia's political landscape remains contentious, with the opposition party tentatively indicating abandoning the Paris Climate Agreement (Coorey, 2024; McDonald, 2024; Morton, 2024), which commits signatories to achieve net zero emissions by 2050.

The Australian government has implemented mandatory climate disclosure standards to address environmental impacts in business generating revenue ranging from AUD 50 million to AUD 500 million and over. It endorses IFRS S2, which focuses on identifying, measuring, and disclosing climate-related risks and opportunities, enabling primary users to make informed financial decisions (Deloitte, 2024b). Complementing this, IFRS S1 sets broader requirements for disclosing all sustainability-related risks and opportunities that could affect an entity's financial performance (Deloitte, 2024a). The Australian Accounting Standards Board (AASB) released a draft standard in 2023, integrating these disclosures into annual financial reporting to enhance corporate

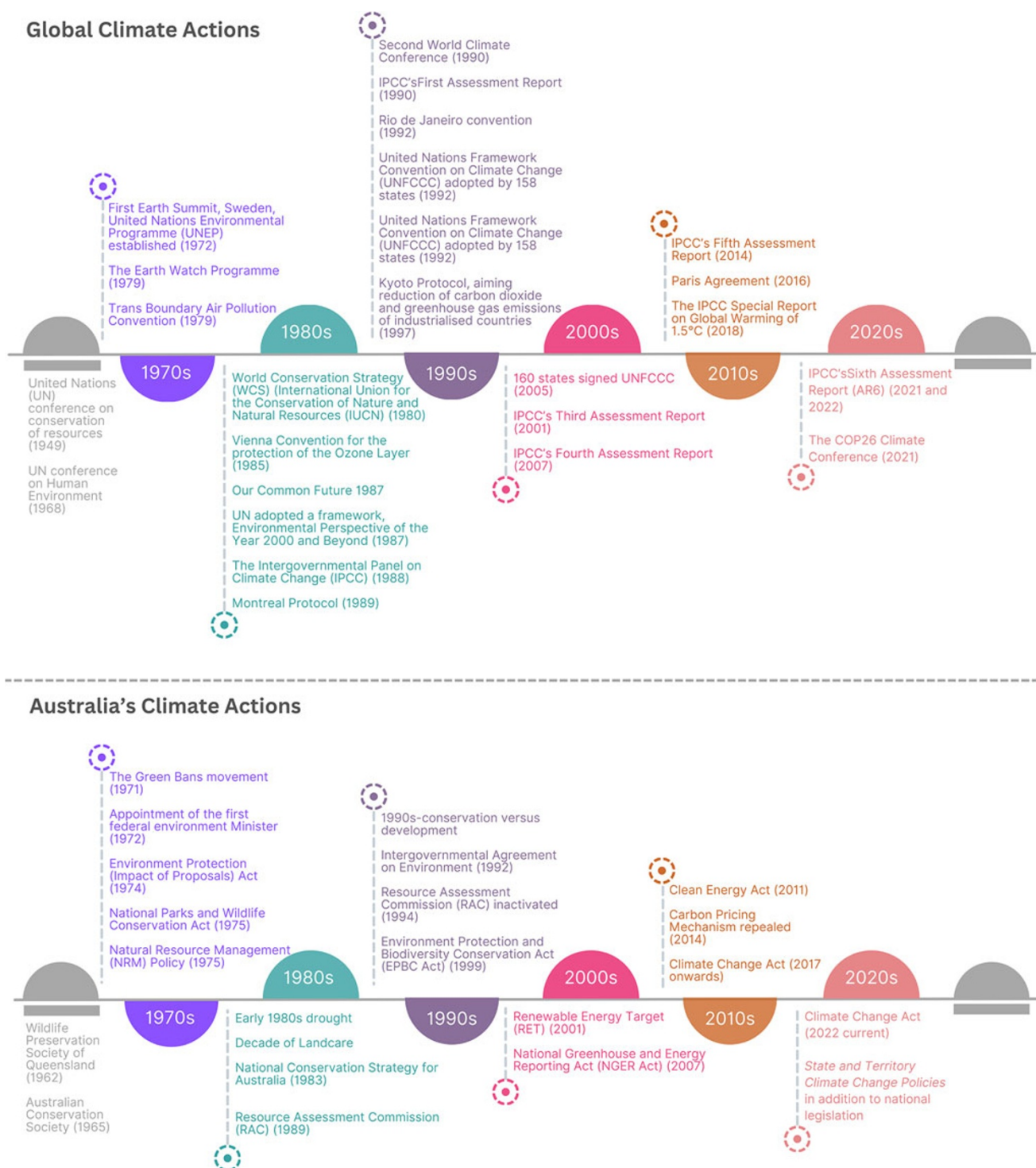


Figure 9. Comparative timeline of global and Australian climate actions during 1970s–2020s.

transparency and accountability on climate risks (TLA, 2024). However, these regulations will only be applied to less than 1% of the fashion businesses, with approximately 120 Australian fashion businesses turning over AUD 50 million in revenue (Buckley, 2024), out of 13,806 retailing in Australia (Liu, 2025). Therefore, the impact of the disclosure appears marginal and may not be sufficient to draw conclusions about broader systemic effects.

The evolution of global and Australian climate policies has been marked by gaps (Christoff & Eckersley, 2021) in the enforcement of mandatory standards, resulting in reliance on voluntary actions and inconsistent reporting on climate contributions. Trade policies, as discussed in the preceding section, have largely overlooked climate change, leaving offshore manufacturing and shifting domestic footprints unaccounted for. This complicates

efforts to measure and compare producer responsibility and accountability.

3.4. Evaluating Australia's fashion and textile industry: a focus on GHG emissions

Projections indicate that the 1.5°C threshold could be surpassed within the next 10–15 years, escalating risks to food systems, ecosystems, and human health (IPCC, 2023a; NASA, 2023a, NASA 2023b; WEF, 2022). As a climate-vulnerable nation, Australia must prioritise adaptation in planning and policy frameworks (Dedekorkut-Howes et al., 2021). GHG emissions, chiefly carbon dioxide (CO₂), are identified as the primary culprit behind global warming (Mikhaylov et al., 2020). According to data from the WorldBank (2023), Australia stands among the top ten nations with the highest CO₂ (equivalent) emissions. These emissions are derived from various sectors, including electricity generation, industrial activities, land use, waste management, stationary energy sources, agriculture, and transportation (DCCEEW, 2021). Notably, Australia exhibits a pronounced per capita emission of GHG from coal combustion, a factor that significantly amplifies the country's overall contribution to the escalating levels of GHG emissions worldwide (Morton, 2023).

As the largest exporter of wool and one of the top exporters of cotton globally, Australia plays a significant role in the natural fibre production industry (WITS, 2024a). The environmental challenges arise from the country's large sheep population, which exceeds 70 million. Each sheep produces approximately 30 litres of methane daily, contributing to climate change, in addition to the issue of deforestation (PETA, 2019). To address this, Australian wool innovation leaders are implementing research projects such as the Methane Emissions Reduction in Livestock (MERiL) program and the Farming for Future initiative by the Macdoch Foundation (AWI, 2024). Cotton farming, while accounting for only 0.2% of Australia's GHG emissions (CottonAustralia, 2024), requires substantial water resources. This has become a challenge due to ongoing droughts and climate change in Australia (UTS, 2022). Consequently, innovations in benchmarking water usage in cotton farming are a priority to counteract the limited water supply (DPI, 2022). The Australian T&C industry encompasses both the onshore production of natural fibres such as wool and cotton for export purposes, and the offshore production of apparel for retail in the Australian market (Payne et al., 2022).

The comparison between GHG emissions and GDP has been previously used by the Department of Industry, Science, Energy and Resources to develop insights and understand the data (DCCEEW, 2021). An illustrative example, as shown in Figure 10, is drawn from data synthesised from various sources, including government reports and global databases. While these calculated values may not precisely reflect the absolute quantities due to the assumptions of a proportional relationship between GDP and GHG emissions necessitated by data constraints, the analysis is anticipated to effectively illustrate overall patterns and tendencies. Despite the potential for some discrepancies in the specific values, the trends highlighted by this examination are expected to be representative and informative.

Australia's significant reliance on imports, particularly in the T&C sector, is evident, with 58.94% of T&C imports originating from China in 2021, positioning China as the primary import partner in this category (WITS, 2024b). In 2021, China's total Gross Domestic Product (GDP) amounted to USD 17.82 trillion (WITS, 2024b), with a corresponding total GHG emissions

of 11,336 million metric tonnes (IEA, 2022). T&C manufacturing, both for domestic consumption and export, contributed USD 1.25 trillion to China's GDP (AGH, 2024), accompanied by 230 million metric tonnes of GHG emissions (Wenqian, 2023), as illustrated in Figure 10. Australia's contribution to China's GDP through T&C imports reached USD 6.68 billion (WITS, 2024b), which can be approximated, using Equation 1, to account for 1.24 million metric tonnes of China's total GHG emissions.

$$\begin{aligned} &GHG_{\text{Australia's T\&C Contribution to China}} \\ &= GHG_{\text{China's T\&C}} \times \frac{GDP_{\text{China's T\&C Export to Australia}}}{GDP_{\text{China T\&C Total}}} \quad (1) \end{aligned}$$

As shown in Figure 11, the emissions associated with the T&C products imported from China alone are four times more than the onshore GHG emissions from T&C manufacturing, which excludes contributions from Australia's other import partners worldwide. However, less than 5% of clothing is fully manufactured domestically (AFC, 2022a, 2022b). As per the National Inventory by Economic Sector 2021 records, Australia's onshore T&C manufacturing sector is responsible for emitting approximately 0.317 million metric tonnes of GHG in 2021 (DCCEEW, 2021). The scarcity of data availability further adds to the complexity of accurately assessing the environmental footprint of the entire T&C manufacturing industry (Jonas et al., 2019).

The diversity in reporting systems and complexity of accounting for the Scope 3 emissions produce variations in the overall accounting of GHG emissions (WRI, 2024a). This could lead to discrepancies between reported emissions and actual emissions, resulting in either overestimation or underestimation of the true values. Based on this, an alternative estimation of GHG emissions from China's T&C exports to Australia should be considered. If 5% of onshore T&C production generates 0.317 million metric tonnes of GHG emissions, then 56% imported from China would correspond proportionally to 3.55 million metric tonnes of emissions. However, emissions from offshore T&C manufacturing may differ, as larger production scales could operate more efficiently compared to lower-volume production. Furthermore, the emissions intensity of energy use differs significantly across countries, as the source of electricity generation, whether coal, natural gas, or renewable technologies, determines the GHG emitted.

Considering both underestimation and overestimation scenarios, the example earlier illustrates the complexity of GHG metrics, underlining the substantial impact of import-related emissions on a country's overall emissions profile, which often goes unnoticed. This discrepancy affects the accurate representation of global GHG emissions associated with T&C manufacturing, obstructing efforts to effectively address and mitigate its environmental impact. Therefore, the responsibility for GHG emissions should not rest solely on individual brands or countries. Instead, it should be a shared accountability between importing and exporting nations, as well as the businesses involved, through the adoption of standardised accounting and reporting systems.

4. Discussion

In the context of the discussion sections 3.1 and 3.2, over the last few decades, the global landscape of the T&C industry has experienced noteworthy transformations, influenced by international trade agreements, evolving policies, and economic dynamics. Trade accords such as GATT, MFA, and ATC have been pivotal

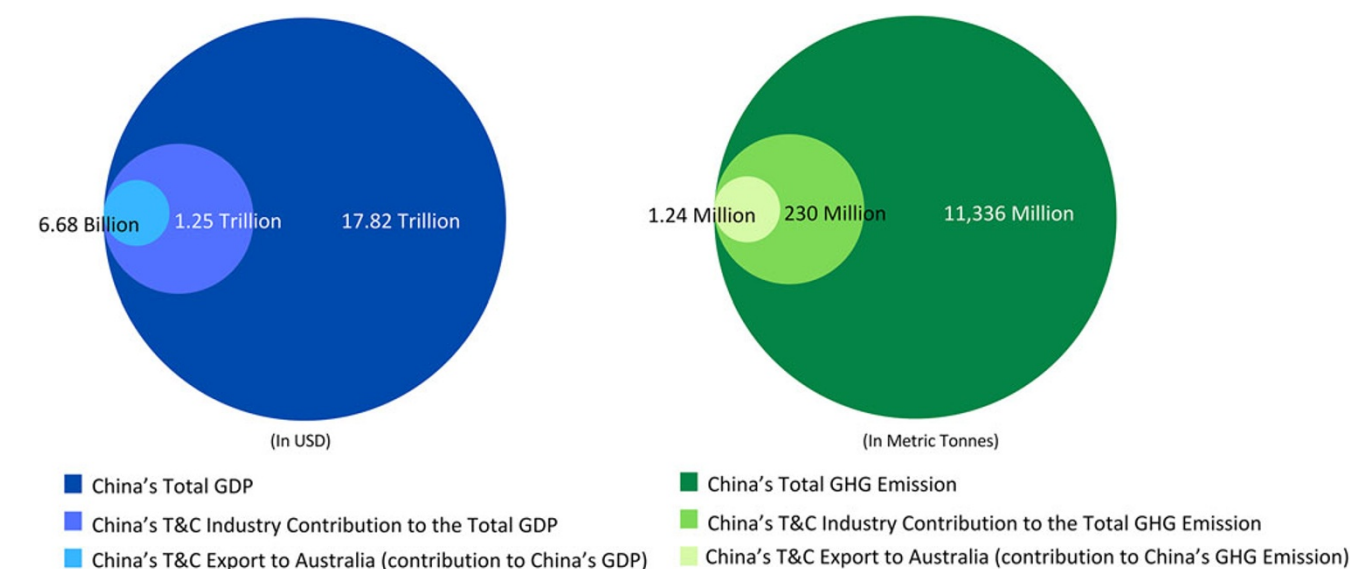


Figure 10. Comparative breakdown of China's 2021 GDP (USD) to GHG emissions from textile and clothing production.

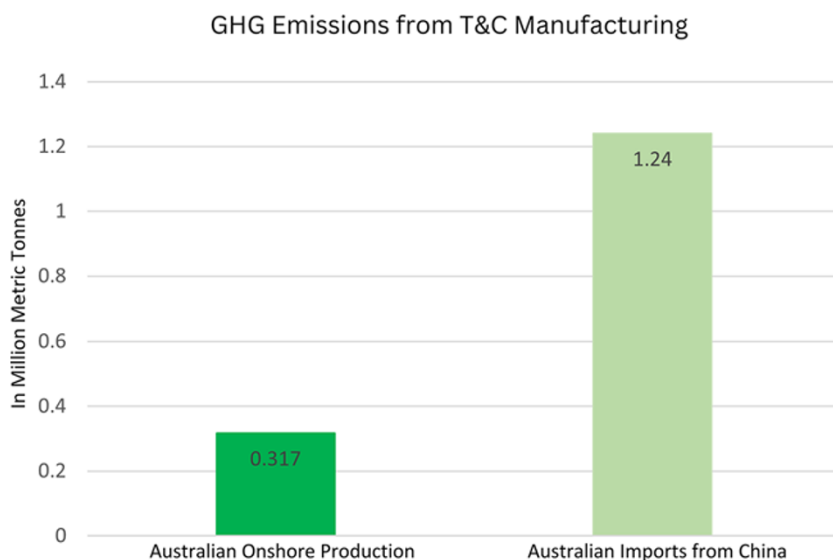


Figure 11. Comparison between Australia's 2021 GHG emissions: onshore T&C production (DCCEEW, 2021a) and calculated GHG emissions from Australian T&C imports from China, using Equation 1.

in reshaping the industry, as they dismantled trade barriers and stimulated outsourcing predicated on wage disparities. Australia, previously a dominant force in the TCF sector, shifted towards more liberal trade policies in the 1980s, leading to an upsurge in offshoring and a corresponding diminution of domestic manufacturing (CIE, 2017). The industry further adapted to the ascendancy of global retailers and an escalating emphasis on sustainability and ethical fashion.

Consumption patterns in the fashion sector have undergone substantial metamorphosis, with amplified production engendering clothing waste and environmentally adverse repercussions (Nature, 2018). The global T&C industry is an obvious contributor to GHG emissions and the depletion of resources. Australian household expenditures on clothing have surged, with Australians buying 56 new clothing items a year (Allan & Allan, 2022), precipitating an accumulation of clothing waste in landfills (McCallion et al., 2021).

The data collected in 2023–2024 (Seamless, 2024) indicates a modest shift in consumer behaviour, with average new clothing

purchases declining to 53 items per person by 2023 and increased engagement in second-hand shopping. While this suggested progress towards sustainability, it was likely influenced by broader economic uncertainties (Jack, 2025), inflation, and challenging living costs (Sato, 2025), which have reduced consumer spending power rather than signifying a fundamental change in values. At the same time, consumers have increasingly turned to ultra-fast fashion platforms such as Shein, Amazon, and Temu, driving intensified consumption and production despite these financial constraints. This interpretation is reinforced by consumption rebounding to 55 items per person in 2024 (Seamless, 2025). Clothing waste remains high, with 222,000 tonnes sent to landfill in 2023 and 200,000 tonnes in 2024, mirroring figures reported in 2018–19 (Allan & Allan, 2022; Seamless, 2025, 2024). Moreover, Australia's heavy reliance on imported clothing and export-based reuse complicates efforts to measure and manage the industry's environmental impact. These patterns highlight that, despite signs of behavioural change, more deliberate systemic reform is needed to create lasting sustainability across the fashion value chain.

The persistent rise in global temperatures and the projected surpassing of the 1.5°C threshold underscore the urgency of meaningful climate action (IPCC, 2018). While Australia has demonstrated formal commitment through legislative frameworks such as the EPBC Act, RET, and Clean Energy Act, and has long embedded principles of ecologically sustainable development (ESD) across all levels of governance, the effectiveness of these measures remains limited (Howes, 2023). The longstanding presence of the NSESD and incorporation of ESD into law have not translated into transformative outcomes, as evidenced by Australia's low ranking, 55th out of 63, in the 2022 Climate Change Performance Index (Brolan, 2023). This suggests a significant gap between policy intent and practical impact, raising questions about implementation, accountability, and the political will to enact reforms at a scale proportionate to the climate challenge. As the risks of global warming intensify, particularly for vulnerable nations like Australia, stronger and more cohesive climate governance will be essential to move beyond symbolic action towards substantive progress.

This article highlights the conflicting dynamics between international trade policies, which aim to stimulate business growth and global integration through mechanisms like tariff elimination and free trade, and climate mitigation efforts, which seek to reduce the environmental impacts of overproduction and overconsumption. While trade policies promote increased production and consumption, environmental policies simultaneously attempt to regulate and limit these very practices. The absence of explicit consideration of climate impact in the formulation of trade policies complicates the assessment of producer and consumer responsibility, making it challenging to measure and compare accountability in addressing climate-related issues. While Australia predominantly mirrors global trends in the industry, climate action, and consumption patterns, deviations exist due to geographical location, economic dynamics, and policy decisions.

T&C products are not only overconsumed but also significantly underutilised, contributing to the alarming environmental impact of the industry. Considering these issues, it becomes imperative to channel efforts at the policy level to promote awareness and encourage sustainable practices, fostering a shift towards a more responsible, educational, and mindful approach to fashion consumption and production. Addressing climate change requires urgent action and a shift from viewing it as an isolated policy issue to embedding it as a core priority across all sectors of governance. Effective climate action demands its integration into trade, education (Padhra & Tolouei, 2023), health, technology, and social policy frameworks, ensuring that climate considerations are systematically incorporated into decision-making processes. This cross-sectoral approach is crucial to driving meaningful, long-term solutions to the climate crisis and aligning with SDG 13 by promoting education, awareness, and capacity-building efforts in climate change mitigation, adaptation, and impact reduction.

5. Limitations and future recommendations

While this paper focuses primarily on GHG emissions and their implications for climate change within the context of the T&C sector, it recognises that sustainability encompasses a broader, multidimensional framework comprising three interdependent pillars: environmental integrity, social equity, and economic viability. Climate change mitigation, through reduced emissions, primarily addresses environmental concerns, but it also intersects with the social and economic dimensions, particularly in the context of production practices, labour conditions, and global trade.

The inclusion of broader sustainability references, such as water use, microplastic pollution, and the SDGs, reflects the complex and interconnected nature of the T&C industry's impact. Future research could explore how industry practices align with SDG 6 (Clean Water and Sanitation), SDG 12 (Responsible Consumption and Production), and SDG 14 (Life Below Water), with particular attention to water pollution, synthetic fibre microplastic shedding, and systemic overproduction. These areas require further investigation to understand how sector-wide transitions can contribute to integrated sustainability outcomes across all three pillars.

In addition, there remains a gap in studies and accessible data that disaggregate the environmental and social impacts of textile manufacturing and consumption across different geographic regions. The globalised nature of the industry, with production and consumption often occurring in different countries, complicates efforts to measure and assign accountability for environmental harm. Future inquiry should prioritise geospatially detailed assessments that consider regional production practices, regulatory environments, and consumer behaviour. Integrating these dynamics into impact accounting frameworks is essential for building more accurate and equitable models of responsibility and intervention.

Finally, there is a need for more longitudinal studies that assess the cumulative and long-term impacts of trade policies, industrial shifts, and regulatory interventions on environmental and social outcomes. Understanding the delayed or compounding effects of such measures over extended timeframes is critical for evaluating the effectiveness and unintended consequences of both national and international sustainability efforts.

6. Conclusion

A comprehensive understanding of how trade dynamics and climate considerations intersect with the T&C sector is essential for fostering sustainability and addressing the sector's significant role in exacerbating the climate crisis. In summary, this comparative analysis paper provides a detailed examination of how the Australian T&C industry has responded to climate change from the 1970s to the 2020s. It documents the industry's development in response to changes in trade policies and regulations that have shaped fashion buying habits within the country. It is evident that climate change has triggered substantial transformations in the Earth's climate system, leading to phenomena such as escalating global temperatures, the retreat of ice caps, and the emergence of extreme weather patterns. Within this context, the T&C industry plays a significant role in contributing to climate change through its substantial GHG emissions and resource consumption.

Australia has been attempting to mitigate its environmental footprint using policies and regulations, such as implementing the mandatory climate disclosure regulations; however, its progress has been slow (Christoff & Eckersley, 2021). The evidence cited in this article points towards the complexity and inability to account for the overall GHG emission under all three scopes. International endeavours such as the Paris Agreement and the SDGs have provided a structured approach to tackling climate change, while encouraging the integration of sustainability principles into the fashion sector. In Australia, governmental and T&C industry stakeholders have implemented measures to address emissions and sustainability; however, these initiatives, while marking progress, remain insufficient in scope and pace relative to the urgency of the challenge.

In reflecting on future directions, the role of Seamless warrants particular consideration. At present, Seamless represents the

only coordinated industry-wide initiative aimed at addressing the challenges of fashion consumption, production, and disposal in Australia. Its efforts in generating and communicating robust data have been critical in making the scale of the problem more visible and in pushing the sector towards greater accountability. While mandated participation in initiatives such as Seamless may become inevitable, the industry should not wait for legislation to compel action. Instead, broad-based engagement is urgently needed now, as relying on a limited number of voluntary partners undermines the scale of change required. It is paradoxical that a sector so central to the problem hesitates to lead the solution; genuine leadership would mean embracing Seamless collectively and proactively, rather than treating it as an optional commitment.

However, the overproduction and overconsumption of clothing make it challenging to entirely decouple emissions from profit, particularly given the resource-intensive and energy-demanding nature of an industry that operates within the framework of capitalism. This reliance on resource extraction presents a fundamental challenge for the industry, unless the industry adopts strategies to dematerialise products by offering services instead, such as circular business models, its growth will continue to rely on increasing resource extraction. The industry must adopt strategies to decouple growth from the increased use of new materials and products, thereby reducing environmental impact and GHG emissions. This includes implementing existing materials with low environmental impact, pursuing aggressive substitution of harmful materials, and exploring new material solutions that may not yet be fully modelled, such as regenerative materials (TextileExchange, 2024). The complex relationship between geopolitical trade regulations, environmental and climate policies, and the T&C industry highlights the need to embed climate objectives into the industry's operational decisions, including supply chain management, material use, and emissions reduction strategies.

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