

Towards a Sustainable and Circular Textile Value Chain:

TOOLBOX FOR POLICYMAKERS FROM HIGH TEXTILE PRODUCTION COUNTRIES

The **purpose** of this toolbox is to provide **policymakers from high textile production countries** with examples of policy* approaches that may support the transition **towards a sustainable and circular textile value chain**. A high textile production country is considered in this toolbox as a country where textile production is an important part of the national economy, and/or where the country plays a major role in global textile production. A high textile production country will likely be a large exporter of textile raw materials and products (intermediate and/or final),⁰¹ while also catering for a local market, with manufacturers often supplying to multinational brands and retailers often headquartered in high consumption countries.⁰²

This document was written following a literature review process and is not exhaustive.** This is a living document that will be updated regularly, incorporating input from consultations and any new policies that are proposed or adopted. To address the environmental and social issues associated with high textile production, this toolbox outlines four phases to accelerate the transition towards a sustainable and circular textile value chain. Countries which significantly contribute to the production of textiles might be unequally burdened with the responsibility to shift to sustainable and circular textile production practices. In this regard, collective efforts among governments, regions, and textile value chain stakeholders are key to accelerate the transition.

This toolbox adopts the same definition of **'textiles'** as the United Nations Environment Programme (UNEP)'s [Sustainability and Circularity in the Textile Value Chain - A Global Roadmap](#) (2023): "all products that contain knit or woven textile components, primarily composed of apparel and footwear, but also including home textiles, technical, medical and automotive textiles, etc." The policy examples included in the toolbox may use different definitions.



* For the purposes of this toolbox, **'policies'** encompass a broad range of tools, referred to as policy instruments, that governments and public institutions may adopt to influence the behaviour of individuals, organizations, and stakeholders towards sustainability and circularity in the textile value chain. These instruments may adopt various forms, including regulatory measures, economic incentives, information-based instruments, among others. Such measures include primary and secondary legislation, as well as non-legally binding instruments (e.g. research grants, etc).

** The authors did not undertake consultations or obtain expert peer-review. The methodology for developing this toolbox included a global scan of existing, emerging, and historic policies which are relevant to the transition toward a sustainable and circular textile value chain. This scan resulted in the development of a database of over 200 relevant policies across the globe. Policy examples from countries in this toolbox may not reflect latest developments; readers are encouraged to check for any recent updates.



PHASE 1

ASSESSING THE CURRENT POLICY LANDSCAPE

A **comprehensive assessment** of the country's policy landscape as it relates to textiles and the impact of textiles in the country can assist countries in selecting policy instruments. An **inclusive consultation process** is vital, including with policymakers across all relevant ministries, industry players (e.g. raw material producers, manufacturers, brands, and retailers), civil society organisations, financial institutions, and consumers, to foster interministerial cooperation, synergies among policies and broader acceptability. The assessment should also be informed by existing data or resources at the sub-national, national, regional and/or international levels (see complementary resources on p 18 of the toolbox). Recognizing the importance and role of the informal sector is also critical.

The **purpose** of the assessment is to, inter alia, (1) build an initial baseline to understand the amount, location and value of current textile production, consumption and disposal levels and drivers; (2) map existing policies and voluntary initiatives related to textiles (at all levels), institutional responsibilities, and actors involved in the value chain; (3) consider the implications of trade requirements; (4) assess the economic, social* and environmental impact of the textile sector across the value chain, including beyond national borders; (5) assess the readiness of textile production facilities, including SMEs to shift to sustainable and circular practices;** (6) identify hotspots, policy gaps, challenges, and opportunities for reform; (7) identify key enablers, such as technology, institutional and technical capacity, and investment; and (8) identify key stakeholders engaged along the value chain, such as fashion schools, academia, think tanks, and research centres to assess the role of youth, innovators, and thought-leaders in the country.

** This includes assessing labour conditions, worker rights, and gender equity within the textile industry, and considering the broader social impact of the textile industry on local communities. Consideration should be given to whether labour conditions comply with international labour standards.*

*** This could include a technology scan and an analysis of facilities' ability to apply resource efficiency and cleaner production, collect pre-consumer waste, remanufacture, recycle, reuse, and/or manufacture for disassembly.*



PHASE 2

ENVISIONING THE PATH FOR SUSTAINABLE AND CIRCULAR TEXTILES

Developing a vision for sustainable, circular textiles can serve as a **strategic guide or blueprint** for a country, ensuring coherence and alignment with overarching goals, such as climate, pollution and biodiversity commitments. This vision might take the form of a standalone textiles strategy or be part of a country's broader industry or circular economy strategy.

Developing a vision is helpful to identify the strategic priorities of the country to address national 'hotspots' or the most pressing environmental and socio-economic issues, set measurable targets, align resources, identify key stakeholders, and establish clear responsibilities and timelines. It is also a key opportunity to identify the policy instruments required to enhance the existing policy framework, foster synergies, and avoid overlaps between policies to create a coordinated policy response throughout the value chain and avoid siloed interventions.

Examples of strategies include the [European Union \(EU\)'s Strategy for Sustainable and Circular Textiles \(2022\)](#), [Chile's Strategy for Circular Textiles by 2040 \(2025\)](#) or the [Netherlands' Policy Programme for Circular Textile 2025-2030](#). For more examples visit UNEP's dedicated knowledge hub for the [Global Textile Policy Dialogues](#).



PHASE 3

INTRODUCING POLICY INTERVENTIONS

A list of **policy examples** that may support the transition of **high textile production countries** towards a sustainable and circular textile value chain are included in the following pages. These examples were chosen because of their geographic spread, relevance to textiles, and/or their innovative approach to textiles regulation. The instruments below are organised according to the type of regulation (direct, economic, information-based, voluntary, behavioural),⁰³ although many are cross-cutting. A combination of policy instruments can support a profound, sustainable transformation.⁰⁴

It is also important to adopt a **value chain perspective** when designing a coherent policy response. The following examples focus on the specific leverage points that a high textile production country may have to influence change along the entire textile value chain.

REGULATORY INSTRUMENTS (DIRECT REGULATION)

Regulatory instruments can mandate or prohibit specific practices or define a level of environmental performance to be achieved. They are usually combined with a monitoring mechanism and sanctions for noncompliance.⁰⁵



INSTRUMENT

ENVIRONMENTAL PERMITS & ENVIRONMENTAL IMPACT ASSESSMENTS

Environmental permits or licenses are **legal authorisations** issued by regulatory authorities that allow businesses and individuals to undertake activities with potential environmental impacts. These **permits set limits** on pollutant emissions, discharges, and waste management practices to minimise pollution and protect both the environment and human health. The permitting process also provides guidance on monitoring, reporting, and assessing resource use and environmental impacts.

Environmental permitting systems are closely linked to environmental impact assessments (EIAs). EIAs aim to **evaluate the potential environmental impacts** of a proposed project or development before it is carried out. The aim is to determine both positive and negative impacts that a project may have on the environment and human health. These assessments are used to inform decision making on whether a project should proceed and how any potential negative environmental impacts may be avoided, mitigated or ameliorated. Specific 'environmental footprint methods' have also been developed to assess the environmental impact of products and/or organisations, such as life cycle assessments, the product environment footprint (PEF) method and the organisation environmental footprint method.⁰⁶

Textile value chain activities, such as spinning and fabric mills, dye houses, and garment manufacturing factories, generate a range of environmental impacts, such as water, air and chemical pollution. In this regard, environmental permitting systems are a key regulatory mechanism at the national level to authorise and manage the environmental impact of such activities. Integrated environmental permitting is viewed as best practice for major pollution sources as it can help optimise the design and operation of industrial installations in line with a holistic understanding of environmental harm.⁰⁷ It is also important to ensure that environmental permitting and EIA processes are coordinated and are implemented in a manner that maximises the effectiveness of both processes and avoids overlaps.⁰⁸



EXAMPLES



Türkiye's Environmental Permit and Licence Regulation (2014) outlines principles and procedures for the application of permits and licenses.⁰⁹ The regulation introduced a single online environmental permit for air, wastewater and noise emissions and waste recovery and disposal, for the facilities listed in [Annex 1 and 2](#).¹⁰ These facilities include yarn, fabric or carpet factories with a production capacity of 3,000 tons per year or more, which include bleaching and dyeing units from finishing processes (Annex 1 (4.4)). These facilities also require an EIA under [Türkiye's Regulation on Environmental Impact Assessment](#) (2022)(Annex 1), due to their potential significant environmental impact.



Some countries have issued technical guidelines specifically for the textile industry, which can help in ensuring consistency and accuracy in assessing factors such as emissions, water quality, waste management, and more. Examples include China's [technical guidelines](#) for the environmental protection in dyeing and finishing textile industry (2015), and the European Commission's [implementing decision](#) establishing best-available-techniques (BAT) conditions specifically for the textile industry (2022).



Specific policy examples in production countries related to public participation in the EIA and environmental permitting processes include [China's Measures for Public Participation in Environmental Impact Assessment](#) (2018), which set out the rights and responsibilities of various parties with an interest in EIA and provides for different forms of public participation, and [Germany's Environmental Impact Assessment Act](#) (1990), which includes substantial detail about public participation (see [art 19](#) as amended).



PRACTICAL GUIDANCE & TOOLS FOR ACTION

The Technical Manual on [How to conduct a PEF study](#) (2023), produced under the framework of the UNEP led [InTex Project](#), is designed to help technical experts to conduct product environmental footprint (PEF) studies for apparel and footwear products, clarifying the steps to follow, the technical modelling rules, as well as helping experts draft the final PEF report. The Manual must be read in conjunction with the PEF and PEFCR method.* The [Annex](#) is a pre-filled template to simplify the development of a PEF report for apparel and footwear products.

For a quick overview of the PEF method, please refer to the [PEF 101 factsheet](#). Environmental footprint methods can also help policymakers assess and design policies by better understanding the hotspots.¹¹

** The **PEF method** is “a life cycle-based method, with detailed rules on how to calculate the environmental contribution of products to a fixed set of 16 environmental impacts (such as contribution to global warming, water scarcity and land use). The method gives precise guidance to model, collect data, and analyse the results for all the flows in and out to the environment, during a product’s entire life cycle”.*

PEFCR refers to the fact that “[f]or certain product categories (such as for apparel and footwear), the PEF method is complemented by PEF Category Rules (PEFCRs). These provide additional guidance on specific aspects and parameters that are most relevant, to calculate the PEF, for a specific product category. Having a PEFCR contributes to increased consistency of the results and it reduces the cost of conducting a PEF study”.¹²



INSTRUMENT

BANS AND RESTRICTIONS TARGETING HAZARDOUS CHEMICALS

These measures ban, phase out, and/or restrict the use, manufacture, distribution, selling, and importation of harmful chemicals used in textile products or during textile fibre production. These measures aim to protect public health and the environment by **reducing or eliminating the exposure to harmful chemicals** and promote the use of safer alternatives where available.

These measures should be developed and implemented in line with the latest scientific findings and take into account international regulations, standards and commitments where applicable (e.g. the Stockholm Convention on Persistent Organic Pollutants (2001), the Global Framework on Chemicals (2023)), enabling clean input for eventual recirculation/recycling.

Examples include bans on the use of certain azo dyes (commonly used to impart vibrant colours to textiles), phthalates (used to enhance the flexibility and durability of textile materials), and perfluoroalkyl and polyfluoroalkyl substances (PFAS)(often used as water and stain resistance in textile applications).



EXAMPLES



[Türkiye’s KKDİK Regulation \(Kimyasalların Kaydı, Değerlendirilmesi, İzni ve Kısıtlanması Yönetmeliği\)](#) (2017) aims to ensure a high level of protection for human health and the environment, as well as the free movement of chemicals in the internal market, by regulating the registration, evaluation, authorisation, and restriction of chemicals. KKDİK is closely aligned with the EU’s Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) regulation. While textile manufacturers and importers are subject to KKDİK’s requirements, the regulation itself does not include specific guidelines for textiles. Textile manufacturers must comply with the general chemical safety and management standards set by KKDİK, ensuring that all substances used in textile production are properly registered, evaluated, and managed according to the regulation’s framework.



PRACTICAL GUIDANCE & TOOLS FOR ACTION

For guidance on chemicals management, explore the work done by the [Strategic Approach to International Chemicals Management \(SAICM\)](#) (e.g. [Policy Brief – A Review of PFAS as a Chemical Class in the Textile Sector](#) (2021); and [Engaging the textiles industry as a key sector in SAICM: a review of PFAS as a chemical class in the textile sector](#) (2021)) and stay informed with the progress made under the [Global Framework on Chemicals](#). Also see the [Inter-Organization Programme for the Sound Management of Chemicals \(IOMC\)’s platform](#) for news, events, resources and tools for chemicals management.



INSTRUMENT

WATER MANAGEMENT REGULATIONS

Water management regulations aim to, inter alia, protect water quality, regulate the quantity of water used, and regulate the treatment and discharge of wastewater from wet processes.* The amount of water used and wastewater generated in textile production can be reduced and safely managed with consideration of fibre choice, production methods, and end-of-life management.¹³

* **'Wet processes'** refer to the water-intensive processing stages of desizing, scouring, bleaching, and/or mercerizing. All these processes discharge wastewater in the forms of cleaning water, process water, non-contact cooling water, and stormwater. These can be contaminated with harmful chemicals, posing risks to people, animals, and the environment.



EXAMPLES



India's 'Zero Liquid Discharge' (ZLD) policy is part of the country's environmental regulations and is implemented through various laws and regulations, including the [Water \(Prevention and Control of Pollution\) Act 1974](#) and the [Environment \(Protection\) Act 1986](#). The policy aims to prevent industrial effluents from being discharged into water bodies without treatment. The textiles industry is identified as a 'water polluting industry' and under the ZLD policy, industrial operators of textile facilities are required to treat their wastewater to remove pollutants and ensure that no liquid waste is discharged outside the facility. To ensure compliance with the ZLD policy, textile facilities can, for example, install dedicated pollution control equipment, or in the case of SMEs, a common effluent treatment plan and common water supply systems.¹⁴

The ZLD policies are enacted by the Central and State Pollution Control Boards, the Ministry of Environment, Forest and Climate Change, as well as the Ministry of Textiles. The state governments and regulators of specific industries (including textiles) are responsible for implementing the policies, with the specific targets on ZLD decided at the sub-national level. Additionally, various courts across the country are adopting a stringent approach on pollution cases;¹⁵ for example, the Madras High Court directed that all textiles industries in Tirupur need to achieve ZLD to obtain approval by the Tamil Nadu Pollution Control Board.¹⁶



China's [discharge standards of water pollutants for dyeing and finishing of textile industry \(2013\)](#) specify the limits of water pollutant discharges during the production of dyeing and finishing of textile processes and includes monitoring requirements.



INSTRUMENT

WASTE MANAGEMENT REGULATIONS

For high textile production countries, textile waste may be common in the form of fabric offcuts or unsold products, also known as pre-consumer waste. Other kinds of waste are also generated throughout the production phase, for example in the form of dyes, release of chemicals, wastewater, packaging, plastics, and others.

Waste management measures can encourage the **prevention and reduction**, as well as the **safe and environmentally responsible** handling, treatment and disposal, of waste. Measures can, for example, promote circular technological innovations (e.g. zero-waste pattern cutting techniques which make use of the entire fabric roll, increased digital technologies and tools which replace physical sampling or tests), encourage the reduction of certain materials (e.g. reduced packaging) and promote the reuse of materials (e.g. manufacturing 'new' products made from used textile materials). Extended producer responsibility (EPR) systems may also be seen as a tool for waste management – albeit increasingly recognised as a tool to promote circularity throughout the life-cycle.



EXAMPLES



The Rio de Janeiro System of Reverse Logistics of Packaging and Packaging Waste - Law No. 8151 (2018) establishes a packaging and packaging waste reverse logistics system within the State of Rio de Janeiro, in partnership with co-operatives and collectors of recyclable material (cardboard, plastics, metals and glass packaging). It establishes responsibility for companies that produce, import, or make packaged products available in the State to implement and operate a take back system of individual or collective packaging, promote and finance environmental awareness campaigns, annually declare the volume of packaging placed on the market and take steps to meet the goals established by the sector agreement to reduce packaging waste.¹⁷



In 2024, Mexico City's Secretariat of the Environment (Sedema) launched "Proyecto de Norma Ambiental para el Manejo Integral de los Residuos Textiles" – a project to devise a framework to encourage the recovery, separation, classification, storage, collection, transportation, valorization, use and final disposal of textiles within Mexico City. Among other goals, the project calls on producers and manufacturers to adopt practices that minimize the generation of textile waste, promote the reuse of materials, and opt for the use of recycled fibers.



The EU's Waste Framework Directive (2008) aims to improve waste management practices across the EU by setting out a framework based on waste prevention, recycling, recovery and disposal. In 2018, the Framework was revised to require EU Member States to implement separate collection systems for textiles by 1 January 2025. In July 2023, the European Commission issued a proposal to revise the framework to introduce mandatory and harmonised EPR schemes in all EU Member States. Following negotiations between the EU institutions, a provisional agreement was reached in February 2025, under which each EU Member State will have to set up its own EPR scheme for textile and footwear products. The revised Directive needs to be formally adopted by the European Parliament and Council before it can enter into force, and subsequently EU Member States will have 20 months to transpose the Directive into national legislation.¹⁸



INSTRUMENT

AIR EMISSIONS REGULATIONS

Air emissions regulation aims to **control and reduce the release of pollutants and greenhouse gases** into the atmosphere from various sources, such as industrial facilities, vehicles, and power plants. In addition, these regulations aim to improve air quality standards to protect public health and the environment and address the effects of climate change. This includes the reduction of carbon dioxide (CO₂) and methane (CH₄), as well as pollutants which have negative effects on public health like sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), and volatile organic compounds (VOCs).

Emissions regulation can drive the development and adoption of cleaner technologies and practices, including within textile production processes. For example, regulations can encourage the use of renewable energy, energy-efficient technologies, and low-emission vehicles. Many countries implement emissions regulations to comply with international treaties and agreements aimed at reducing global pollution and greenhouse gas emissions, such as the 2015 Paris Agreement under the United Nations Framework Convention on Climate Change.



EXAMPLES



In 2019, the Government of Gujarat (in India) launched an Emissions Trading Scheme (ETS) pilot project for PM emissions in the city of Surat.¹⁹ The Surat Cluster is one of the largest textile manufacturing clusters in India. Under the ETS Scheme, the Gujarat Pollution Control Board sets a limit on the total volume of PM emissions for participating industries. Initial findings of the effectiveness of the scheme found that participating industries reduced their PM emissions by 24% (with an 8% margin of error), compared to those adhering to business-as-usual.²⁰ The expansion of the scheme is now planned to other areas.

**INSTRUMENT****LABOUR AND HUMAN RIGHTS REGULATIONS**

Labour and human rights regulations aim to **protect workers' rights, safety, and wellbeing**. These typically include provisions related to equal and fair pay, power imbalances, leave entitlements, safe working conditions, and anti-discrimination measures, amongst others. These regulations should acknowledge the gendered implications of textile production, such as chemical exposure during pregnancy and women's ability to hold leadership and technology-oriented roles.

Although current labour and human rights regulations may not include provisions specific to the textile sector, it is important to acknowledge the historical and systematic exploitation of textile workers. This context highlights the importance of prioritising the application of labour and human rights regulation within the textile value chain.

**EXAMPLES**

The proposed [United States Fashioning Accountability and Building Real Institutional Change Act \(FABRIC Act\)](#) (proposal originally introduced in 2022, and reintroduced in 2023) aims to strengthen worker protections in garment production in the USA by amending the Fair Labor Standards Act of 1938. If adopted, the Act would require the establishment of a nationwide garment industry registry, introduce new requirements which stipulate fashion brands and manufacturers as jointly accountable for workplace wage violations, and would set hourly pay in the garment industry, eliminating piece rate pay until minimum wage is met.



[India's Occupational Safety, Health and Working Conditions Code](#) (2020) consolidates and amends laws addressing occupational safety, health and working conditions, with special provisions for women, contract labour and migrant workers. It also contains special provisions for workers in certain industries (such as work conducted in factories), with certain textile activities (e.g. dyeing on fabrics in textiles, rubber (synthetic) industries, and leather tanning) listed as an industry involving 'hazardous processes' and thus subject to specific provisions.



The [Bangladesh Labour Act](#) (2006) governs labour relations and employment practices in Bangladesh. It covers a wide range of issues related to workers' rights, including working hours, wages, benefits, health and safety, and dispute resolution. The Act aims to protect the rights of workers and promote fair labour practices in Bangladesh. It provides for maternity leave and imposes restrictions on employment of children and adolescents. It also establishes mechanisms for the registration of trade unions and the resolution of labour disputes. While the law does not provide specific details for textile production, a secretary seat for the Ministry of Textile and Jute is held on the National Council for Industrial Health and Safety, who may be constituted by the Government to develop and implement national policy and guidelines for ensuring health and safety in industrial establishments (Article 323).



**INSTRUMENT****SUSTAINABLE PUBLIC PROCUREMENT (SPP) POLICY**

Public procurement (which represents on average 13% to 20% of GDP)²¹ and governments (as the largest consumers in a given economy) can play a critical role in creating demand for sustainable and circular textiles.²² The types of textile products that governments may commonly procure include uniforms (e.g. protective clothing and defence), medical textiles (e.g. personal protective equipment and scrubs), and household textiles and furnishings.

By establishing clear mandates and guidance, public procurement policies can support the **integration of environmental and social criteria into purchasing decisions**, driving demand for responsibly produced and circular textiles.²³ This includes setting minimum requirements for durability, material quality, ethical production, and environmental performance, such as recyclability or recycled content, preferred fibres, and assurance of the absence of modern slavery. Procurement policies that go beyond cost efficiency to reflect a balance of environmental, social, and economic value can also drive innovation, including through circular business models such as repair, reuse, and rental, thereby extending product life and reducing resource use across the textile lifecycle.

**EXAMPLES**

The Philippines' 2023 Amended Implementing Rules and Regulations of Republic Act No. 9242 ("An Act Prescribing the Use of the Philippine Tropical Fabrics For Uniforms of Public Officials and Employees and For Other Purposes"), mandate the use of Philippine tropical fabrics in uniforms for government officials and employees. It was enacted, inter alia, to support locally produced textiles. The law requires that all government uniforms are made with at least 5% of natural textile fibres and silk.

**PRACTICAL GUIDANCE & TOOLS FOR ACTION**

The [Second Edition of UNEP's Sustainable Public Procurement Implementation Guidelines](#) (2021) is designed to support policymakers, experts and consultants on designing SPP policies and implementing them. Specifically, the Guidelines provide a methodology and roadmap for designing and implementing SPP policies and action plans, with the aim to provide a common vision, language and framework for SPP. The Guidelines include best practices and case studies.



ECONOMIC INSTRUMENTS

Economic instruments are most commonly used to adjust market prices so that environmental and social costs are internalised in the prices of goods and services. Examples include eco-taxes, emission charges, and extended producer responsibility schemes.²⁴



INSTRUMENT

EXPORT PROCESSING ZONES (EPZs) AND SPECIAL ECONOMIC ZONES (SEZs)

EPZs and SEZs are industrial zones with **special incentives**, such as tax incentives, customs duty exemptions, streamlined procedures and infrastructure support, set up to attract foreign investors. Textile production facilities in these zones may be subject to specific, altered social and environmental laws, as well as other regulations.

Special consideration should be taken to encourage and address circularity, sustainability and labour conditions within these zones, ensuring that EPZs and SEZs are not exempt from environmental, labour, and gender equity laws, and that regulations do not prevent these Zones from seeking solutions that promote circularity and sustainability (e.g. exporting offcuts to other areas for manufacturing 'new' garments, or importing second hand clothing for repair, refurbishment or repurposing). Given that these Zones are subject to their own specific economic and legal frameworks, they could serve to pilot stricter social and environmental regulations in textile production.

In EPZs and SEZs, textile manufacturing may be happening near other forms of industrial manufacturing or processing. This proximity creates opportunities for **industrial symbiosis** which enables collaborative efforts within and between facilities, facilitates closed loop models of production, and collective investment in infrastructure such as wastewater management. Industrial symbiosis is an operational model already being successfully implemented in other value chains,²⁵ which can also improve sustainability and circularity of textile production processes.



EXAMPLES



India's Special Economic Zones (SEZ) Act (2005) is a policy framework that aims to promote exports, attract foreign investment, and create employment by establishing SEZs across the country. The Act provides various incentives and benefits to businesses operating within these zones, such as tax exemptions, duty-free import of goods, and simplified procedures for setting up and operating businesses. Facilities in SEZs are still subject to environmental impact assessment requirements.²⁶ This is not a textiles-specific policy, but many textiles are produced in SEZs.



As an example of industrial symbiosis, **Cambodia's Industrial Transformation Map for Textile and Apparel Industry 2023-2027** outlines its commitment "to develop new industrial parks / improve the existing industrial parks with common facilities like ZLD plant, waste collection and disposal facility, and continuous supply of high-quality power, which will help the industries to reduce the overall cost of production, provide better facilities to their employees and improve the sustainability index".²⁷





INSTRUMENT

INVESTMENT IN TECHNOLOGY AND EQUIPMENT

Investing in **technology and equipment** for the textile sector can stimulate and support the growth and accessibility of sustainable and circular practices, for example fibre-to-fibre recycling or the upgrading of machines which run on renewable energy. Such investments can also stimulate certain market conditions and opportunities, for example, by creating new markets for recycled materials, fostering innovation in sustainable technologies, and generating jobs in recycling and remanufacturing industries. These investments can also reduce the need for, and cost of, landfilling and incineration of used textiles.



EXAMPLES



India's Amended Technology Up-gradation Fund Scheme (ATUFS) (2016-2022) aimed to promote a favourable business environment in India, fostering job creation and export growth through the "Make in India" initiative, emphasising environmentally friendly and high-quality manufacturing. This fund was specifically for the upgrade of textiles machinery.²⁸ It sought to boost investment, productivity, quality, employment, and exports in the textile industry, as well as encourage investment in textile machinery manufacturing with benchmarked technology.

The incentive provided by ATUFS was a one-time capital subsidy for installing machinery that met the eligibility criteria. The ATUFS is outlined in [Resolution No.6/5/2015-TUFS](#), and section 6.3.2.3 stipulates that preference would be given to applicants proposing to install energy-saving technology and machinery. A subsidy cap was introduced under ATUFS for each individual entity to broaden the scheme's coverage among micro, small and medium enterprises.



Pakistan's National Energy Efficiency and Conservation Authority's Strategic Plan (2020-2023) outlines national targets for achieving energy efficiency gains, including for the textile sector. The Plan identifies the textile sector (accounting for 27.6% of the total electricity consumed by industries and 40% of the natural gas) as having the highest efficiency gains. Specific actions to achieve energy efficiency gains within the sector include "improving the efficiency of compressors, heat transfer and recovery systems, lights, motors, power factor correction panels, process control, steam system optimization and variable frequency drives".²⁹ Sectoral Objective 1 aims to save up to 1.3 MTOE (Million Tons of Oil Equivalents) by 2023 through the implementation of minimum energy performance standards across industries. Specifically, this objective includes a project to install energy meters and automatic controls in more than 100 textile industries to reduce leakages of compressed air, projected to achieve savings of up to 0.2 MTOE in the textile industry by 2023. The [National Action Plan Energy Efficiency and Conservation 2023-2030](#) builds on the Strategic Plan, with a continued focus on the textile sector and its potential for energy efficiency.



In addition, broader national investments in circular and sustainable technology and equipment can also benefit the textile sector. In Thailand, for example, the government encourages the use of biomass-based steam burners, instead of fossil-fuel based, for heat generation through grants up to 30% of investments for projects less than 2,000,000 baht (\$58,320) per factory.³⁰





INSTRUMENT

TAX INCENTIVES FOR CIRCULAR PRACTICES AND DISINCENTIVES FOR UNSUSTAINABLE PRACTICES

Economic incentives can be used to **discourage linear practices and promote circular practices, business models, and services**, such as recycling, upcycling, and repair. Restructuring tax policies, including fiscal and trade policy measures (e.g. removing tariffs), can create powerful economic incentives for the uptake of circular economy solutions. Similarly, by imposing financial charges (e.g. levies or taxes) on practices that involve environmentally harmful activities, governments can create a financial disincentive for such practices and make circular practices more economically attractive.



EXAMPLES



Thailand has reduced its tariffs for certain clean technologies, which can play a key role to its affordability, and thus encourage the uptake of clean technologies, including for textile manufacturers. Specific examples include zero tariffs for wastewater treatment machines (HS 84.21)(in 2013) and solar cells (HS 8541)(in 2007).³¹



Australia's Queensland Waste Levy (2019) is a charge imposed on most waste disposed of in landfill, aiming to reduce landfill waste and promote recycling and resource recovery. The levy applies to all waste, including textiles, though rates vary by waste type and landfill location. The generated revenue is used to fund waste management initiatives. Landfill operators pay the levy, typically passing on costs to anyone who generates waste, incentivising waste reduction and alternative disposal methods. Compliance is monitored by the Queensland Government through audits and inspections, ensuring adherence to levy regulations. Rates in the metro zone increase by \$10 per tonne each year until the general levy rate reaches \$145 per tonne on 1 July 2027. All levy rates will then increase each year in line with the indexation rate published on the departments' website for the financial year.



INFORMATION-BASED INSTRUMENTS

Information-based instruments are intended to provide information on the environmental and social impacts of products and business operations to both producers and consumers. Examples include ecolabels, certification schemes, corporate sustainability reporting and awareness campaigns.³²



INSTRUMENT

ECOLABELS, CERTIFICATION SCHEMES AND STANDARDS

Voluntary sustainability standards (VSS) can be used as a governance tool encouraging companies to adopt sustainable consumption and production practices.³³ VSS are increasingly being adopted by companies as the core of their sustainability approaches.³⁴ The United Nations Forum on Sustainability Standards defines VSS as voluntary “standards specifying requirements that producers, traders, manufacturers, retailers or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land use planning and others”.³⁵ VSS, in particular ecolabels and certification schemes, are tools that businesses can use to communicate the sustainability attributes of their products to consumers.

Ecolabels and certification schemes aim to provide clear, verified, and reliable information about the environmental and social impacts of items and business operations, and/or about the presence of harmful substances. These instruments aim to encourage behavioural change and help consumers make informed choices. Labels, which can be mandatory or voluntary, can cover a range of criteria, including the environmental qualities of a product, such as ‘organic’, and labour practices, such as ‘fair trade’. Labels can be used to either reward and certify products, or to caution or warn against them.

A range of different VSS, ecolabels, and certification schemes exist. Recognising these schemes within national legislation as schemes which provide guidance on the processes and requirements of textile circularity could help highlight their role in the transition towards a sustainable, circular textile value chain. Additionally, incentives for compliance with these schemes may also encourage broader adoption. In other sectors, this is commonly done by using VSS in the framework of Sustainable Public Procurement.



EXAMPLES



Kasturi Cotton Bharat (launched in 2023) is an initiative of the Government of India, textile trade bodies and industry, to create “premium value for cotton grown in India as per benchmarked specifications”. The aim is to deliver cotton that is certified on key parameters that meet all quality expectations. Kasturi Cotton uses blockchain technology to facilitate traceability and ensure transparency throughout the stages of the cotton’s journey along the value chain. The branding process of Kasturi Cotton includes physical audits and inspections, sampling and testing, and finally certification. Consumers of the final products can confirm that it is made from Kasturi Cotton through a QR code.



Thailand has developed several compulsory standards for manufacturing, including standards aiming to promote energy efficiency and reduce pollution.³⁶ Specific examples relevant to textiles include Thailand’s technical regulations for the use of dye (which became effective on 19 August 2023), including **acid dye** and **sulphur dye**. These regulations require the label of acid and sulphur dyes for textile and leather products to include warnings about potential hazards such as toxic substances.



Since 1992, **OEKO-TEX** operates as a non-profit certification and testing organisation. It comprises of 17 independent research and test institutes. Its fundamental objective is to facilitate the sourcing of innovative and environmentally responsible products, prioritising the well-being of individuals and the environment. The organisation focuses on enabling the acquisition of premium sustainable fabrics, including those derived from eco-friendly, organic, recycled, and biodegradable materials. Central to its mission is the OEKO-TEX Standard 100, which aims to minimise the use of harmful chemicals in the textile value chain. This standard ensures that textiles conform to specific criteria, certifying them to be free of substances deemed harmful. To maintain certification, products must undergo annual re-certification, as the loss of certification carries the risk of losing associated business opportunities.



PRACTICAL GUIDANCE & TOOLS FOR ACTION

For guidance on consumer information and ecolabelling please visit [One Planet Network's Hub](#). The Hub includes background on ecolabeling, trainings, materials, guidelines and handbooks relevant for ecolabels, including a [series of good practices](#). The trainings include the [GEN Ecolabelling Training Programme](#), covering 9 modules developed by UNEP and the Global Ecolabelling Network (GEN), to help stakeholders, including policymakers, to build knowledge on ecolabeling and their impact on the environment.



INSTRUMENT

DUE DILIGENCE AND DISCLOSURE REQUIREMENTS

Due diligence and disclosure requirements (which can be mandatory or voluntary) aim to promote **transparency and accountability** in various areas, including business practices, environmental protection, human rights, and financial reporting. These regulations typically require organisations to conduct thorough assessments (due diligence) of their operations and value chains to identify and mitigate risks, such as environmental damage, human rights abuses, or financial misconduct. Often these regulations require information to be publicly disclosed. Although existing due diligence and disclosure requirements are not generally textiles-specific, textiles are often identified as a high-risk industry for human rights and environmental degradation.



EXAMPLES



In December 2024, China released '[Basic Standards for Corporate Sustainability Disclosure \(Trial\)](#)'. The standards aim to support businesses to align their sustainability practices with global environmental, social and governance (ESG) practices. While China continues to work on harmonizing its sustainability standards, the 'Basic Standards' are to be implemented by businesses on a voluntary basis.³⁷ ESG reporting will be mandatory for large-listed companies from 2026, with the full framework expected to be fully operational by 2030.³⁸



[Pakistan's First Five Year National Action Plan on Business and Human Rights \(2021-2026\)](#) outlines the State of Pakistan's expectation for businesses to "be cognisant of and guided by international guidelines and principles", including the Organisation for Economic Cooperation and Development (OECD) Due Diligence Guidelines for Responsible Supply Chains in the Garment and Footwear Sector.³⁹



PRACTICAL GUIDANCE & TOOLS FOR ACTION

The OECD has developed guidance to help enterprises along the garment and footwear supply chain to implement the due diligence recommendations of the [OECD Guidelines for Multinational Enterprises on Responsible Business Conduct](#). The [OECD Due Diligence Guidance for Responsible Chains in the Garment and Footwear Sector \(2018\)](#) provides comprehensive guidance to support a common understanding of due diligence in the sector, underscoring that due diligence should be "ongoing, proactive and reactive and applied with flexibility and should not lead to a 'tick the box' approach".⁴⁰

VOLUNTARY INSTRUMENTS

Voluntary instruments are flexible and cost-effective initiatives from a policymaking perspective as they give producers the choice to decide how best to achieve goals with little or no 'policing' by the state.⁴¹



INSTRUMENT

KNOWLEDGE PLATFORMS

Knowledge platforms aim to strengthen and share the knowledge and skills required to support the transition to a sustainable and circular textiles value chain. These platforms can provide both public and private-sector stakeholders with **access to information** on the best available knowledge, techniques, and technologies which enable circularity, as well as accredited circular product suppliers for procurement. Knowledge platforms in the textile value chain are often led by multistakeholder initiatives which bring together industry, government, and not-for-profits.



EXAMPLE



At the sub-national level, [Mexico City's Circular Economy Law \(2023\)](#) stipulates three instruments which aim to promote the implementation of sustainability policies in companies. These are a circularity assessment procedure, a circularity label, and a circular economy public information system.⁴² The circularity assessment is a voluntary procedure for businesses to submit any processes, products and services developed or marketed in Mexico City to an evaluation of compliance with certain circularity criteria. Compliant businesses will be able to use the circularity label, and each will have a registration number that can be traced. The Digital Agency for Public Innovation of Mexico City will oversee the development of the circular economy public information system. This public information system will be a knowledge platform including "basic information on circular economy strategies and business models, as well as guides and manuals to implement and replicate sustainable projects".⁴³



PRACTICAL GUIDANCE & TOOLS FOR ACTION

The [Green Growth Knowledge Partnership \(GGKP\)](#), established in 2012, is a global network of policy, business and finance professionals and organizations which offers policymakers guidance, good practices, tools and data to support the transition to a green economy. In particular, its [Green Policy Platform](#) offers the largest collection of knowledge products for a policy driven transition to a nature-positive, pollution-free and climate-friendly economy, including global reports, case studies and, guidance notes. These products include textile specific knowledge products, such as [Thailand's case study](#) on sustainable and circular textile value chains and its linkages with trade and trade policy (published in 2023).

The [UNEP's Eco-Innovation platform](#) guides through UNEP's eco-innovation manual and is a repository of good practices for eco-innovation, including case studies from Viet Nam, Malaysia, Peru, among others. [UNEP's Eco-Innovation Manual \(2020\)](#) outlines a methodology for the implementation of eco-innovation* within small and medium sized companies (SMEs) to inform, guide and support manufacturing companies to improve their sustainability performance.

To be read alongside the Manual, its [Textiles Supplement \(2021\)](#) provides textile sector-specific information in eco-innovation, including case studies, using the core principles and methodology outlined in the Manual. Through eco-innovation's focus on supporting particularly SMEs in developing countries in implementing sustainable and circular business models and sharing learnings from this work, the platform also provides valuable insights for policymakers and other stakeholders when devising policy approaches to transition to a sustainable and circular textile value chain.

**'Eco-innovation' is defined as "the development and application of a business model, shaped by a new business strategy that incorporates sustainability throughout all business operations based on life cycle thinking and in cooperation with partners across the value chain. It entails a coordinated set of modifications or novel solutions to products (goods/services), processes, market approach and organizational structure which leads to a company's enhanced performance and competitiveness".⁴⁴*



INSTRUMENT

TRAINING AND CAPACITY BUILDING

Training and capacity building on sustainability and circularity is vital to **fill skills and knowledge gaps** among stakeholders throughout the textile value chain. Training and capacity building in the textile value chain is often led by multi-stakeholder initiatives which industry, government, and not-for-profits are engaged in together. Multi-stakeholder initiatives are often the most comprehensive approach, as they combine the industry-specific expertise of businesses and non-government organisations, with the authority and credibility of policymakers.



EXAMPLES



[India's National Handloom Development Programme \(2021-22 to 2025-26\)](#), including the Comprehensive Handloom Cluster Development Scheme, Handloom Weaver Comprehensive Welfare Scheme and Yarn Supply Scheme, are initiatives aimed at supporting the handloom sector in India. They focus on promoting handloom products, improving the livelihoods of handloom weavers, and enhancing the overall welfare of artisans. These schemes provide skill development training, as well as financial assistance and access to markets, aiming to preserve and promote India's rich handloom heritage and integrate handlooms into mainstream markets for promoting the widespread adoption of sustainable practices.

Handlooms rely predominantly on manual processes, significantly minimizing energy consumption. Often using natural fibers such as cotton, silk, and wool, and repurposing textile waste, locally known as *chindi*, the handloom sector is inherently environmentally sustainable. With 70% of the workforce comprising of women, it is vital for the government to support fair competition through targeted policies, enabling handlooms to thrive as a model for sustainable production.



[Viet Nam's National Action Plan on Sustainable Consumption and Production \(2021-2030\)](#), developed by the Ministry of Industry and Trade, includes the objective of developing and disseminating technical manuals and training materials on models for sustainable design, ecological design, and reuse and recycle-oriented design for a range of export-oriented products, such as textiles. According to the Plan, the presiding and coordinating entities to pursue this objective are both the Ministry of Industry and Trade and Viet Nam's Environmental Industry Association.⁴⁵





INSTRUMENT

VOLUNTARY AGREEMENTS

Voluntary agreements aim to stipulate a **non-mandatory commitment** between stakeholders to achieve certain environmental, social, or economic objectives. While there may be incentives for participation, there are no penalties for non-compliance. These agreements are often the result of comprehensive stakeholder consultation, negotiation and collaboration and thus might be more flexible in their implementation. Voluntary agreements in the textile value chain are often conducted under the governance of the private sector, though policymakers and government play an important role in accrediting or authorising their work.



EXAMPLES



In September 2024, Viet Nam's Ministry of Industry and Trade signed a [memorandum of understanding \(MoU\)](#) with the Viet Nam Textile and Apparel Association, the Viet Nam Leather, Footwear and Handbag Association, the Viet Nam Cotton and Spinning Association and IDH to strengthen ongoing efforts to promote sustainable and circular economy models within Viet Nam's textile industry. The MoU establishes a solid foundation for a strong partnership and collaboration between policymakers, government officials, industry and donors.⁴⁶



In 2023, the Government of Peru signed a [Clean Production Agreement with three textile companies](#) (Topy Top SA, Sur Color SA, and Topy Top Tex SA). These types of agreements are voluntary between the private sector and the government. The Agreement includes a series of goals and actions to improve production and environmental standards, including the goal of producing 15% of fabrics with sustainable fibers at Sur Color Star SA, and training 70% of the personnel of Sur Color Start SA in the proper handling of hazardous waste generated in the fabric manufacturing process, within the first year.



Since 2011, [ZDHC \(Zero Discharge of Hazardous Chemicals\)](#) operates as a not-for-profit, multi-stakeholder organisation representing various sectors of the textiles value chain, including brands, retailers, manufacturers, and chemical suppliers. ZDHC's Roadmap to Zero initiative mandates the elimination of priority hazardous chemicals from the industry. A key tool in this endeavour is the Manufactured Restricted Substances List (MRSL), which identifies chemicals prohibited from intentional use in facilities processing textile materials and finished goods. ZDHC also provides a standardised wastewater testing protocol for the industry to ensure harmful chemicals are not discharged into the environment. To comply with ZDHC guidelines, organisations must adhere to the MRSL, regularly test wastewater to meet specified guidelines, and engage in continuous improvement efforts. Failure to comply may result in removal from the list of compliant suppliers, leading to limited business opportunities, as well as potential reputational damage.



BEHAVIOURAL INSTRUMENTS

Behavioural instruments provide a non-regulatory way to influence human behaviour towards more sustainable choices.⁴⁷



INSTRUMENT

SUPPORT FOR INNOVATION AND RESEARCH

Government support and **funding for innovation and research** can support the development of new materials, processes, and technologies that reduce the environmental impact of textiles production. Investments can drive technological advancements in textile manufacturing, leading to more resource efficient and cost-effective production methods. Investments of this kind can support the development and reputation of textile production in the country more broadly, and impact trade and overall competitiveness.



EXAMPLES



Sri Lanka's Board of Investment (BOI) is the primary government agency responsible for promoting and facilitating foreign investment in Sri Lanka. In relation to textiles, the BOI plays a key role in attracting foreign textile companies to invest in Sri Lanka's textile industry. The BOI offers various incentives and support services to encourage investment in textile manufacturing, such as tax breaks, streamlined approval processes, and assistance with locating suitable sites for textile factories.⁴⁸ The Board intends to position Sri Lanka as a hub for ethical manufacturing.



Adopting new and more circular materials often require government investment in the form of grants or infrastructure investment on the pathway to scale up. Examples include, in Indonesia, a mycelium startup (Mycotech) receiving Indonesian and Australian government funds at several points in the R&D journey,⁴⁹ as well as EU investment in the Italian biotech company SQIM, also creating mycelium materials, receiving early investment through EU granting schemes before going on to raise venture capital via industry/government consortia.⁵⁰ Another example is the company Aquafil, who produces Econyl, a recycled Nylon 6, receiving EU Horizon 2020 funding to scale.⁵¹



The **LIFE ANHIDRA project** (2022-2025) is an example of research and development funded by the European Commission in partnership with industry (Jeanologia SL), aiming to "reduce water discharges from textile finishing industry by up to 98% by re-using process water, thus saving resources and protecting the environment."⁵² The project's aim is to create technology to be patented internationally and implemented in over 100 facilities within 5 years of project end.



**PHASE 4****MONITORING POLICY EFFECTIVENESS**

The **ongoing monitoring of policies** is critical to ensure regulatory measures are adjusted as needed. For textiles, sustainable and circular policies may be considered an emerging space, therefore specific approaches to monitor and measure these policies are still nascent.

**LIST OF OTHER COMPLEMENTARY UNEP RESOURCES**

- UNEP's [Stocktaking Report](#) – this 2020 report provides an analysis of the environmental and socio-economic hotspots along the entire value chain, thus identifying which stages in the value chain are dominant in different impacts, and maps out initiatives working to address those.
- UNEP's [Roadmap Report](#) – this 2023 report builds on the analysis of the Stocktaking Report by providing a Roadmap for all stakeholders to address these environmental and socio-economic hotspots through a sustainable and circular textile sector. It has stakeholder-specific annexes that outline the key priorities and actions for each stakeholder (brands and retailers, financial institutions, raw material producers and manufacturers, policymakers, innovators and recyclers, NGOs and communicators).
- UNEP's and UN Climate Change's [Sustainable Fashion Communication Playbook](#) – this 2023 report is for communicators (Marketing/PR/Communications managers of brands, but also influencers, journalists, etc) to redirect communication on fashion towards sustainable and circular solutions, including countering greenwashing and shifting the narrative around overconsumption and what is valued.
- For more information about UNEP's work on textiles please visit [UNEP Textile Initiative](#). As part of this Initiative, UNEP also contributes to building a globally coordinated policy response through the [Global Textile Policy Dialogues](#).
- For more information about UNEP's work on circularity please visit [UNEP Circularity Platform](#).

**SHARE YOUR FEEDBACK**

We welcome any feedback you may have on the policies and content presented, as well as any other examples that could be valuable for other countries!

Please reach out to us at:

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WWW.UNEP.ORG/SUSTAINABLETEXTILES

Endnotes

- 01 Raw materials, whether natural or synthetic, may be produced within high textile production countries or imported from elsewhere. Equally, high consumption countries may also be high raw material producers (e.g. USA and Australia are large fibre exporters).
- 02 The global export value of textiles and clothing is 4%, while a high exporting country could be over 10% of the total export value (see World Integrated Trade Solution, “[World Trade Summary 2019](#)” (2019)).
- 03 This classification of instruments builds on previous UNEP publications. See UNEP, [Mainstreaming Eco-Innovation in Sustainable Consumption and Production Policies](#) (2017), 39.
- 04 UNEP/EA.5/4, [Progress in the implementation of resolution 4/1 on innovative pathways to achieve sustainable consumption and production](#), Nov 10, 2020.
- 05 UNEP, [Mainstreaming Eco-Innovation](#), 39.
- 06 See for example European Commission, “[Environmental Footprint Methods](#)”.
- 07 OECD, [Integrated Environmental Permitting Guidelines for EECCA Countries](#) (2005).
- 08 OECD, [Guiding Principles of Effective Environmental Permitting Systems](#) (2007).
- 09 FAO, “[Türkiye Regulation on Environmental Permit and License](#)” (FAOLEX Database, 2024).
- 10 OECD, [OECD Environmental Performance Reviews: Turkey 2019](#) (2019), 93.
- 11 See European Commission, “[Environmental Footprint Methods](#)”.
- 12 UNEP, [PEF 101 factsheet](#).
- 13 See Subramanian S. Muthu., e.d. [Water in Textiles and Fashion: Consumption, Footprint, and Life Cycle Assessment](#) (Woodhead Publishing, 2019).
- 14 India Ministry of Textiles, [Guidelines for Centrally Sponsored Scheme for Integrated Processing Development Scheme \(IPDS\)](#). The IPDS scheme was launched in 2014, as a revision to the previous Scheme for Integrated Textile Parks (SITP), which was launched in 2005.
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- 18 European Commission, “[Press Release – Commission welcomes provisional agreement to enhance the circularity of textiles and reduce food and waste](#)”, Feb 17, 2025.
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- 22 UNEP, [Sustainable Public Procurement: How to Wake the Sleeping Giant! Introducing the United Nations Environment Programme’s Approach](#) (2021), 12.
- 23 For more information on circular procurement refer to: UNEP, [Building circularity into our economies through sustainable procurement](#) (2018).
- 24 UNEP, [Mainstreaming Eco-Innovation](#), 42.
- 25 For further insights into building collaboration for industrial symbiosis see UNEP, [Mainstreaming Eco-Innovation](#), 36.
- 26 The Gazette of India, Ministry of Environment and Forests, [Notification 2006](#), 50.
- 27 Royal Government of Cambodia, [Industrial Transformation Map for Textile and Apparel Industry 2023-2027](#) (Unofficial Translation) (2023), 26.
- 28 Government of India, Ministry of Textiles, [Annual Report 2022-23](#), 68.
- 29 Ministry of Energy (Power Division), National Energy Efficiency and Conservation Authority, [Strategic Plan \(2020-2023\)](#), 4.
- 30 UNEP, [Sustainable and Circular Textile Value Chains: Linkages with trade and trade policy – Thailand Case Study](#) (2023), 21.

- 31 Ibid, 18. The report’s section on trade policy instruments that can impact sustainability and circularity of textile value chains mapped out trade policy instruments that can have potential impacts on sustainability and circularity. However, the report notes there was no data showing to what extent they were designed with environmental considerations, or to what extent they have affected environmental hotspots identified in the previous section. More quantitative analysis such as modelling could be done in future to take a closer look at their impacts and effectiveness.
- 32 UNEP, *Mainstreaming Eco-Innovation*, 44.
- 33 United Nations Forum on Sustainability Standards, *5th Flagship Report: “Voluntary Sustainability Standards (VSS), Sustainability Agenda and Developing Countries: Opportunities and Challenges* (2022), xi.
- 34 Ibid, xi.
- 35 Ibid, 4.
- 36 UNEP, *Sustainable and Circular Textile Value Chains: Linkages with trade and trade policy – Thailand Case Study* (2023), 18.
- 37 Giulia Interesse, “China Unveils Its First Set of Basic Standards for Corporate Sustainability (ESG) Disclosure”, *China Briefing*, Dec 23, 2024. For a more in-depth overview of the standards see [here](#) for the analysis provided by the International Institute of Green Finance, Central University of Finance and Economics.
- 38 “China Releases First Corporate Sustainability Disclosure Standards”, *ESG News*, 24 December 2024; UNEP FI, “China embarks on a journey of ESG disclosure: 2024 progress and focus for 2025”, Jan 7, 2025.
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- 43 Ibid.
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- 52 European Commission, “LIFE AHIDRA project”, *LIFE Public Database*.