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www.solstice-project.eu
info@solstice-project.eu
SOLSTICE

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Executive Summary

Berlin's vibrant fashion scene promotes awareness around sustainability, encouraging the cycle of reuse and reducing reliance on fast fashion. Although challenges remain, the city is making strides toward a more circular textile industry, aligning economic growth with environmental responsibility.

Berlin's consumer landscape is shaped by diverse purchasing behaviours, reflecting Germany's status as the world's fourth-largest market for apparel and footwear, valued at US $69.9 billion.[1] Despite this, household spending on clothing and footwear reached a record low of 3.9% in December 2020. Price, brand reputation, and social influence are the primary drivers of purchase decisions, with sustainability ranking lower. Second-hand shops and flea markets are popular but face barriers, including hygiene concerns and difficulty finding the right sizes. Rental and repair services are underutilised due to limited awareness and cost perceptions.

The distribution and retail sectors are the largest employers in Berlin's textile value chain, **with over 16,000 jobs.** However, the second-hand retail sector is relatively small, providing an estimated 575-588 jobs. The repair and maintenance sector is well-established, with 637 repair establishments and 48 upcycling businesses. Employment in textile waste collection and sorting is modest at 135 jobs, but this figure is based on modelled estimates. Textile recycling remains in its infancy.

Circular textile services in Berlin are extensive and diverse, with a wide range of points of interest, including upcycling workshops, flea markets, repair cafes, and vintage shops. The city's strong cultural connection to sustainable fashion is evident, but existing services are not fully utilised. This suggests that Berlin's circular textile ecosystem has significant untapped potential, particularly in encouraging greater community participation.

Germany leads Europe in post-consumer textile collection, processing, and exports, and Berlin reflects this leadership with an extensive textile collection system. However, the city, like many European metropolitan areas, relies on external providers for the treatment of post-consumer textile waste. Collection and sorting activities are primarily funded by exporting garments for reuse, but declining textile quality and shrinking sales in receiving countries threaten this model's financial sustainability. Without secure funding, Berlin's textile collection network may become vulnerable.

The estimated climate impact from post-consumer textile flows in Berlin is 605 thousand tonnes of CO2e per year. Environmental impacts vary across materials and categories, but reducing unnecessary consumption is the most effective strategy for minimising these effects. Although impacts such as microplastics are not yet fully integrated into existing scientific models, the data highlights the significant potential for impact reduction through circular strategies like reuse, repair, and recycling.

[1] https://fashionunited.com/statistics/global-fashion-industry-statistics/germany

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1. Introduction to the territory profile

1.1 Context setting

The global textile industry is 0.3% circular: of the 3.25 billion tonnes of materials it consumes each year, over 99% come from virgin sources.[2] In part, this metric is bogged down by high virgin material consumption, with per capita fibre consumption rising significantly over the decades: from 8.3 kilograms in 1975 to 14.6 kilograms in 2022. This is expected to grow by a further 7.4% per year up to 2030. At the same time, textile recycling is lagging—the strong majority (61.4%) of discarded textiles are landfilled or incinerated. Just 8% is reused or exported, 6.3% ends up in cascading recycling, and 2.2% is lost during collection or sorting.

The current scale of textile consumption is linked to numerous impacts: from climate change to water eutrophication and water scarcity. Social impacts, including labour rights violations, health hazards and threats to livelihoods in producing communities, are also pronounced. The circular economy offers a means to address these challenges, through various R-strategies such as **Reduce, Reuse, Repair, Repurpose,** and **Recycle.**

1.2 SOLSTICE: 5R solutions for textile integrated circular economy

The SOLSTICE project aims to address the key social, environmental and technical challenges posed by the textile industry through a circular economy lens. Funded by the European Union's Horizon Europe research and innovation programme under grant agreement No. 101134989, SOLSTICE is taking steps towards a circular textile industry through the implementation of pilot projects in four territories: Berlin, Grenoble, Catalonia, and Prato. The project will showcase how circular economy practices can be tailored to and implemented across the textile industry.

1.3 Territory profile: goal, methodology and structure

In collaboration with the four territories studied, Circle Economy led a current state analysis of the textile ecosystem, including current circular practices. This analysis provides insight into areas where immediate action is needed and informs the selection of relevant circular practices in each of the four territories. A mixed-methods approach was used to analyse this current state: first, describing the national and local textile industry context; giving an overview of relevant national and regional textile policies; and conducting a detailed analysis for the territories in focus. This includes a material flow analysis to map textile flows across the value chain, a baseline analysis of employment in the territory's textile value chain, a consumer behaviour analysis vis a vis textile consumption and circular solutions, and an environmental impact assessment to determine the current consequences of the textile value chain in each territory. The final chapter for each territory

[2] Circle Economy. (2024). *The circularity gap report textiles*. Amsterdam: Circle Economy. Retrieved from: CGR Website

profile extracts key findings to formulate recommendations for the design of the circular textile pilot project.

2. The current state of the circular textile landscape

2.1 National industry context

While not known for being a textile-producing country, Germany's fashion and textile industry remains significant. In 2023, Germany was the second-largest textile importer globally, with an import value of US$54 billion,[3] [4] while in 2022, it was the fifth-largest textile exporter, with US$40 billion in exports.[5] The sector generates approximately €29 billion in annual turnover and employs around 124,000 people across 1,400 companies.[6] Within this, fashion clothing and functional textiles account for around €12 billion in annual turnover.[7] A substantial portion of Germany's textile industry is also in technical textiles, which supply industries such as the automotive, aerospace, and medical sectors. German-produced technical textiles maintain a 40% export rate.[8] While domestic textile production has grown by 6.5% since 2015, foreign trade has expanded by 8%,[9] reinforcing Germany's reliance on imported textiles. Meanwhile, domestic clothing and household textile production continues to decline.[10]

Germany is also a major textile consumer, with an average household spending on textiles of €690 annually—above the European average of €490 per year.[11] Germans consume approximately 19 kilograms of textiles per person annually, generating around 1.56 million tonnes of textile waste each year,[12] a figure projected to reach 17 kilograms per capita in 2025.[13] Additionally, retail sales of second-hand goods in stores are projected to reach approximately US $3.13 billion in 2025.[14] In 2021, 75% of German consumers aged 35 to 44 reported purchasing second-hand clothing, reflecting a strong demand for pre-owned apparel.[15]

Germany leads Europe in post-consumer textile collection, supported by an organised network that includes charitable actors and a well-established recycling culture. Between

[3] https://www.premierevision.com/en/magazine/special-report-germany/
[4] https://oec.world/en/profile/hs/textiles
[5] https://oec.world/en/profile/bilateral-product/textiles/reporter/deu
[6] The Confederation of the German Textile and Fashion Industry. (n.d.). Industry Sectors. Retrieved from: Textil+Mode Website
[7] https://textil-mode.de/en/about-us/branch-of-industry/
[8] The Confederation of the German Textile and Fashion Industry. (n.d.). Industry Sectors. Retrieved from: Textil+Mode Website
[9] https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[10] https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[11] Fashion United. (2022). Global Fashion Industry Statistics: Germany. Retrieved from: Fashion United Website
[12] https://dress-ecode.com/en/tackling-textile-waste-in-europe-germany-france-and-italy-under-the-loop/
[13] https://dress-ecode.com/en/tackling-textile-waste-in-europe-germany-france-and-italy-under-the-loop/
[14] https://www.statista.com/forecasts/1396501/second-hand-apparel-shops-germany
[15] https://www.statista.com/forecasts/1396501/second-hand-apparel-shops-germany

2015 and 2018, the national collection rate grew by an average of 2.2% annually, reaching 15.3 kilograms per inhabitant and a total of 1.27 million tonnes in 2018.[16] The national collection rate currently stands at approximately 64%, as compared with an average separate collection rate for reuse and recycling of 28% in Europe. However, the majority of collected textiles are exported, often to countries in the Global South with less developed waste management systems.[17]

Textile reuse in Germany has seen an 8% increase since 2015, reaching 810,000 tonnes annually, representing 62% of all collected textiles. However, these figures only appear in official waste statistics when processed through Germany's waste management systems and do not account for exports (462,500 tonnes exported in 2022 alone).[18] Despite increasing collection rates, the quality of collected textiles has declined, negatively impacting recycling processes.[19] One key issue is the use of bottom-hinged containers, which, while cost-effective, lead to higher contamination levels that reduce the usability and value of collected textiles. However, at recycling plants, reuse rates have improved—from 54% in 2015 to 62% in 2018—demonstrating progress in recovery efforts.[20]

The *European Circular Economy Action Plan* has made transforming the textile industry into a circular system one of Germany's four key priorities.[21] In line with this, Germany's *Circular Economy Strategy* places a strong focus on textiles and clothing.[22] The country is a European leader in post-consumer textile collection, supported by an organised network that integrates charitable organisations and a well-established culture of recycling and waste separation.[23] With its robust collection system and expanding second-hand market, Germany is well-positioned to drive circular textile solutions. However, challenges remain in reducing virgin textile consumption, increasing reuse rates, and addressing the environmental and social impacts of textile exports.

2.2 Local industry context

Berlin's relationship with fashion has long been one of reinvention and resilience. In the late 19th and early 20th centuries, the city was a global fashion hub, its thriving fashion industry led by around 2,700 companies. Many of these were Jewish-owned and central to the iconic 'Berlin Chic' movement,[24] which rivalled the prestige of Paris Couture and influenced

[16] https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[17] https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[18] Destatis. (2023). 5.5 kilograms per capita: 462,500 tonnes of old clothes and second-hand textiles were exported from Germany in 2022. Retrieved from: Destatis Website
[19] BSVE. (2020). Textile Study 2020: Demand, Consumption, Reuse and Recycling of Clothing and Textiles in Germany. Retrieved from: BSVE Website
[20] https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[21] Holland Circular Hotspot. (2022). Circular Economy opportunities in Germany. Retrieved from: Holland Hotspot Website
[22] Kreislaufwirtschaft Deutschland. (2024). Nationale Kreislaufwirtschaftsstrategie. Retrieved from: Kreislaufwirtschaft Deutschland Website
[23] Circle Economy. (2024). The Circularity Gap Report Ireland: A circular transition for post-consumer textiles. Retrieved from: CGR Website
[24] Sark, K. (November, 2011). Tracing the Locations of Berliner Chic: Then and Now. Retrieved from: Suites Culturelles

culture far beyond Germany's borders.[25] This golden era came to a halt in line with the rise of the Nazi regime, which systematically targeted Jewish-owned fashion businesses through economic disenfranchisement, and violent persecution, ultimately dismantling Berlin's vibrant fashion ecosystem. [26] [27] [28]

In the decades since, Berlin has re-emerged as a centre for creativity and innovation, carving out a unique identity as a leader in sustainable and circular fashion. The city's fashion landscape thrives on its progressive ethos, with Berlin Fashion Week serving as a showcase for both avant-garde designers and sustainable fashion initiatives. Berlin's robust circular fashion ecosystem, supported by an array of organisations, research institutions, networks, and financing initiatives, further sets it apart.[29] The Textile Coop Berlin as well as the Textile Prototyping Labs exemplify the spirit of collaboration and innovation. They bring together designers, engineers, and researchers, offering access to advanced prototyping tools and a material library to develop cutting-edge textiles.[30]

While the city is not a manufacturing or production centre, Berlin's embrace of circular practices is evident in its grassroots initiatives,[31] small-scale garment production,[32] and various textiles and fashion innovation programmes dedicated to sustainable positive impact, such as Vorn, The Berlin Fashion Hub[33] and The German Fashion Council programmes. Circular Berlin has been pivotal in fostering these efforts,[34] engaging local stakeholders through projects like the A-Gain Guide,[35] which maps textile-saving organisations across the city. Other initiatives, such as STREETWARE Saved Item, bring attention to textile waste by repurposing discarded garments found on Berlin's streets.[36] Sustainability and upcycling are increasingly becoming a cornerstone of Berlin's fashion identity. Local labels like Meyburg Taschen, Fade Out Label, and Natascha von Hirschhausen are integrating eco-conscious principles into their designs,[37] while platforms

[25] Textiles Society of America. (2023). Fashion Metropolis Berlin 1836-1939: The Story of the Rise and Destruction of the Jewish Fashion Industry. Retrieved from: Textiles Society of America
[26] Westphal, U. (2019). *Fashion metropolis Berlin 1836–1939: The story of the rise and destruction of the Jewish fashion industry*. Henschel Verlag.
[27] Lasky, S. (2023). How the Nazi's destroyed Berlin's thriving fashion industry. Retrieved from: DW News
[28] Ingram, S. & Sark, K. (2011). *Berliner chic: A locational history of Berlin fashion*. Intellect Ltd
[29] Padalkina, D. (2018). Circular Berlin: how to develop circular economy in Berlin. Retrieved from: European Circular Economy Stakeholder Platform
[30] Padalkina, D. (2018). Circular Berlin: how to develop circular economy in Berlin. Retrieved from: European Circular Economy Stakeholder Platform
[31] Sustainable Cities Platform. (2018). Circular Berlin. Retrieved from: Sustainable Cities Platform Website
[32]Padalkina, D. (2018). Circular Berlin: how to develop circular economy in Berlin. Retrieved from: European Circular Economy Stakeholder Platform
[33] Vorn. (n.d.) Vorn: The Berlin Fashion Hub. Retrieved from: Vorn Website
[34] Padalkina, D. (2018). Circular Berlin: how to develop circular economy in Berlin. Retrieved from: European Circular Economy Stakeholder Platform
[35] A-Gain Guide (n.d.). A-Gain Guide. Retrieved from: A-Gain Guide Website
[36] Escaffre, E. (n.d.) Textile Journeys- an interactive deep dive into Berlin's discarded textiles. Retrieved from: Circular Berlin Website
[37] Behrendt, S., Henseling, C. & Zwiers, J. (2021). Zirkuläre Innovationen im Bereich Textilien in Berlin: Potenziale und Governance-Ansätze. *Wissen. Wandel. Berlin. Report No. 7*. Retrieved from: Ecornet

such as Kleiderkreisel (Vinted),[38] and rental services like POOL[39] encourage consumers to embrace circularity through R-strategies.[40]

Education also plays a central role in Berlin's fashion ecosystem. Home to the highest concentration of fashion schools in Europe,[41] the city's institutions, such as the University of the Arts and Weißensee, are nurturing the next generation of designers with a strong focus on sustainability and innovative materials.[42] This educational foundation fuels Berlin's reputation as a hotbed for smart textile production, with over 50 startups exploring the intersection of technology and fashion.[43]

In the meanwhile, start-ups such as Circular.Fashion, Reversed.Fashion, Faircado, and Reverse Supply push forward the Circular Economy for textiles with their softwares and groundbreaking technologies.

Berlin has firmly established itself as Germany's leading fashion city, thanks to a combination of government support, a thriving business ecosystem, and a dynamic creative community.[44] Since 2007, the city has invested in mentoring programmes, workshops, and competitions to empower startups and emerging talent, fostering innovation across the industry.[45] Today, Berlin boasts 4,800 fashion businesses and approximately 25,500 industry professionals,[46] contributing to a vibrant sector.

At the core of this success is a dedicated community of creatives, educators, and innovators, united by a shared vision of advancing circular and sustainable fashion.

3. Governance & policy overview

3.1 National overview

Germany is making strides toward a circular economy with the adoption of the *National Circular Economy Strategy* in December 2024. This landmark strategy outlines a comprehensive plan to transition the nation to a circular model, aiming to reach major environmental and climate goals. Key targets include reducing primary material consumption to eight tonnes per capita by 2045, doubling the share of secondary raw materials by 2030, and cutting municipal waste by 10% by 2030 and 20% by 2045.[47] Clothing

[38] Vinted (n.d). Vinted. Retrieved from: Vinted
[39] Fashion Week Berlin (n.d.). Fashion Week Berlin. Retrieved from: Fashion Week Berlin
[40] Behrendt, S., Henseling, C. & Zwiers, J. (2021). Zirkuläre Innovationen im Bereich Textilien in Berlin: Potenziale und Governance-Ansätze. *Wissen. Wandel. Berlin. Report No. 7*. Retrieved from: Ecornet
[41] Berlin Partner. (2021). Fashion and Design Industry. Retrieved from: Business Location Center Website
[42] Behrendt, S., Henseling, C. & Zwiers, J. (2021). Zirkuläre Innovationen im Bereich Textilien in Berlin: Potenziale und Governance-Ansätze. *Wissen. Wandel. Berlin. Report No. 7*. Retrieved from: Ecornet
[43] Berlin Partner. (2021). Fashion and Design Industry. Retrieved from: Business Location Center Website
[44] Berlin Partner. (2021). Fashion and Design Industry. Retrieved from: Business Location Center Website
[45] Behrendt, S., Henseling, C. & Zwiers, J. (2021). Zirkuläre Innovationen im Bereich Textilien in Berlin: Potenziale und Governance-Ansätze. *Wissen. Wandel. Berlin. Report No. 7*. Retrieved from: Ecornet
[46] Berlin Partner. (2021). Fashion and Design Industry. Retrieved from: Business Location Center Website
[47] Kreislaufwirtschaft Deutschland. (2024). Nationale Kreislaufwirtschaftsstrategie. Retrieved from: Kreislaufwirtschaft Deutschland Website

and textiles are recognised as one of ten critical action fields in the strategy, which employs economic, technological, design, legislative, and sector-specific measures to drive the transition. A crucial aspect of this strategy is its framework for implementing EU regulations such as the *Ecodesign Regulation* and the *Waste Framework Directive*,[48] alongside a strong emphasis on European and global cooperation. Collaboration among industry, government, and society is highlighted as pivotal to the strategy's success.[49]

Germany has long been a leader in waste collection and recycling, with 26% of separately collected textiles being recycled and a well-established system of separate waste collection. The *Commercial Waste Ordinance* (GewAbfV) mandates the separate collection of textiles from commercial sources, while amendments to the *German Recycling Act* and the *EU Waste Framework Directive* will require the separate collection of household textile waste starting in January 2025. The *Kreislaufwirtschaftsgesetz* (KrWG), or *Circular Economy Act*, serves as Germany's main legislative framework for waste management. Last amended in 2020, it establishes ambitious recycling targets and promotes waste prevention and producer responsibility. Germany also relies on charitable actors, identified by the *FairWertung* label, to collect textiles that meet ecological and social standards.[50] These organisations ensure responsible handling through ethical resale, donation, or recycling, preventing improper disposal or profit-driven exploitation.

Germany is also advancing sustainability and accountability in the textile sector through legislative measures, producer responsibility, and certification initiatives. *The Act on Corporate Due Diligence Obligations in Supply Chains*, effective since 2023, requires enterprises with at least 3,000 employees—and, from 2024, those with at least 1,000 employees—to adhere to strict human rights and environmental standards. Companies must establish risk management systems, implement preventative and remedial measures, and report on human rights and environmental issues across their supply chains.[51]

At the same time, a national Extended Producer Responsibility (EPR) for textiles is currently under discussion in Germany, in alignment with the upcoming *EU Waste Framework Directive*, which will place financial and operational responsibility for textiles on producers, manufacturers, importers, and online platforms. However, the EPR's specifics remain uncertain, with early indications suggesting it may not include quotas for fibre-to-fibre recycling or domestic reuse. Germany's strong competition laws could influence the EPR's design, likely favouring a competitive model for producer responsibility where multiple organisations or entities handle producer responsibility, rather than a single centralised

[48] Kreislaufwirtschaft Deutschland. (2024). Nationale Kreislaufwirtschaftsstrategie. Retrieved from: Kreislaufwirtschaft Deutschland Website
[49] Kreislaufwirtschaft Deutschland. (2024). Nationale Kreislaufwirtschaftsstrategie. Retrieved from: Kreislaufwirtschaft Deutschland Website
[50] Circle Economy. (2024). The Circularity Gap Report Ireland: A circular transition for post-consumer textiles. Retrieved from: CGR Website
[51] CSR in Deutschland. (n.d.). Supply Chain Act: Act on Corporate Due Diligence Obligations in Supply Chains. Retrieved from: CSR in Deutschland Website

system. While this may foster innovation, it also raises challenges, such as ensuring fee modulation accurately reflects environmental impacts.[52]

To further support sustainable practices, Germany has introduced certification labels such as the *Grüner Knopf* (Green Button), a government-run label certifying sustainable textiles,[53] and the Blue Angel eco-label, which assesses textiles for durability, reusability, recycled content, and repairability since 1978.[54]

Finally, the World Wildlife Fund's (WWF) recommendations for a circular textile economy in Germany outline the need for robust policy instruments to complement these efforts. These include the Ecodesign for Sustainable Products Regulation (ESPR), repair targets for various textile categories, increased collection and recycling rates, binding reuse targets with EPR fee modulation, and stricter export regulations to distinguish between reusable textiles and waste.[55] Together, these measures collectively aim to foster a more sustainable and circular textile industry.

3.2 Federal state and city-level overview

Berlin stands out as a unique entity in Germany's political and administrative landscape. Functioning both as a city and a federal state, Berlin's governance structure differs significantly from other German cities. Its mayor serves as the equivalent of a minister-president in other states, and its policies operate simultaneously at the city and state levels, unlike most regions where federal and municipal decision-making processes are distinct.[56] Moreover, as Germany's political epicentre, Berlin houses the major constitutional bodies, reinforcing its strategic importance.

The Senate Department for Environment, Mobility, Consumer, and Climate Protection plays a pivotal role in advancing Berlin's circular economy. Tasked with implementing environmental policies, the department's key areas of focus include climate protection, the mobility revolution, and fostering circularity. Its team of approximately 30 individuals includes 15 dedicated to ministerial functions, such as developing climate strategies and overseeing the execution of various projects.[57]

One noteworthy initiative is the Zero Waste Agency, a collaborative effort between the Senate Department for Urban Mobility, Transport, Climate Action and the Environment, and Berlin Waste Management. This agency spearheads Berlin's transition toward a circular

[52] Circle Economy. (2024). The Circularity Gap Report Ireland: A circular transition for post-consumer textiles. Retrieved from: CGR Website
[53] Grüner Knopf. (n.d.). Grüner Knopf: Sozial. Ökologisch. Staatlich. Unabhängig zertifiziert. Retrieved from: Grüner Knopf Website
[54] Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt Berlin. (2020). Dokumentation Fachdialog "Bekleidungsbeschaffung unter Berücksichtigung sozialer und ökologischer Aspekte mit dem Fokus auf zirkuläre Textilien für die öffentliche Beschaffung." Retrieved from: Berlin.de Website
[55] Aechtner, J., Tauer, R. et al (2023). A Comprehensive Circular Economy for Germany in 2045. Retrieved from: WWF Germany
[56] Business Location Center Berlin. (n.d.) Government and administration. Retrieved from: Business Location Center Berlin Website.
[57] EC. (2024). Circular Resource Management: Berlin. Retrieved from: European Commission Website

economy by championing zero-waste goals. Berlin consistently outperforms the national average on several environmental indicators related to circularity, including resource consumption metrics across land, water, mobility, and food, as well as recycling rates for items like glass and paper.[58]

However, Berlin's legislative capabilities as a federal state are limited. It can legislate independently only on specific topics, such as education and culture. Most legislative power resides with the national government.[59] Despite this, Berlin leverages its position to set positive examples and incentivise private businesses and grassroots initiatives to embrace circular practices. The textile sector in Berlin highlights these efforts. Charities like Berliner Stadtmission[60] and the German Red Cross[61] play a critical role in collecting and sorting consumer textiles. Berliner Stadtmission in particular donates clothing collected first and foremost to those in need in their central clothing store for homeless individuals, and remaining clothes are sold in their second-hand neighbourhood shops. Additionally the charity operates a central textile sorting hub known as 'Textilhafen' where donations are manually sorted and damaged garments are resold to designers and hobbyists. [62] [63]

Berlin's zero-waste agenda is gaining momentum, driven by two cornerstone initiatives: the *Berlin Waste Management Concept 2020–2030* and the *Berlin Zero Waste Strategy 2030*. The *Berlin Waste Management Concept 2020–2030*,[64] rooted in the zero-waste principle, outlines 80 measures aimed at expanding waste prevention, reuse, and high-quality recycling. While not explicitly part of a broader circular economy strategy, it focuses on managing household, commercial, and construction waste, targeting reductions in waste production, improved recycling, and proper disposal of residual waste.[65] Positioned as a national and international lighthouse project, it sets ambitious standards for sustainable waste management based on the waste hierarchy. Complementing this, the *Berlin Zero Waste Strategy 2030* sharpens the focus on specific areas such as construction and demolition waste, household waste, and potentially sewage treatment.[66] It aligns with the

[58] EC. (2024). Circular Resource Management: Berlin. Retrieved from: European Commission Website
[59] Impact Hub. (n.d). How ambitious legislation can pave the way for greater circularity. Retrieved from: Impact Hub Website
[60] Berliner Stadtmission. (n.d.). Upcycling und Second Hand. Retrieved from: Berliner Stadtmission Website
[61] DRK. (n.d.). Existenzsichernde Hilfen gegen Ar,mut und Ausgrenzung. Retrieved from: Deutsches Rotes Kreuz Website
[62] Fachverband Textilrecycling. (2015). Konsum, Bedarf und Wiederverwendung von Bekleidung und Textilien Deutschland. Retrieved from: BVSE Website
[63] Berliner Stadtmission. (n.n.). Ehrenamtliche für den Verkauf im Textilhafen am Samstag. Retrieved from: Berliner Stadtmission Website
[64] Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt Berlin. (2021). Abfallwirtschaftskonzept für Siedlungs- und Bauabfälle Sowie Klärschlämme Planungszeitraum 2020 bis 2030: Zero Waste Strategie des Landes Berlin . Retrieved from: Berlin.de Website
[65] Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt Berlin. (2021). Abfallwirtschaftskonzept für Siedlungs- und Bauabfälle Sowie Klärschlämme Planungszeitraum 2020 bis 2030: Zero Waste Strategie des Landes Berlin . Retrieved from: Berlin.de Website
[66] Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt Berlin. (2022). Berliner Zero Waste-Strategie 2030: Kreislaufwirtschaft und Zirkuläres Wirtschaften für mehr Klima- und Ressourcenschutz. Retrieved from: Berlin.de Website

overarching goals of the Waste Management Concept but emphasises waste prevention and maximising resource use to avoid incineration and landfilling.

Other ambitious frameworks include the *Climate Neutral Berlin 2045*[67] [68]strategy, which is legally anchored in the *Berlin Climate Protection and Energy Transition Act*. This law mandates a 70% reduction in CO_2 emissions by 2030 and at least 90% by 2040, with the ultimate goal of achieving climate neutrality by 2045. A key instrument supporting this transition is the Berlin Energy and Climate Protection Programme (BEK 2030), which serves as a strategic roadmap for reducing CO_2 emissions across key sectors, including energy supply, buildings and urban development, industry, transportation, and private households.[69] While these frameworks do not specifically address textiles or the fashion sector,[70] they offer a comprehensive approach to addressing the city's energy and climate challenges.

Berlin's commitment to circular textiles aligns with broader German and European initiatives, such as the *Circular Economy Act*, the *European Waste Framework Directive,* and the *European Strategy for Sustainable and Recyclable Textiles*. The 2023 Textilkreislauf Berlin pilot project stands as a testament to these efforts. This initiative successfully demonstrated the feasibility of a closed-loop textile system within Berlin. Old, unusable textiles were collected, sorted, and recycled into t-shirts by Circularity Germany utilising mechanical recycling techniques. T-shirts were then sold in HUMANA stores across Berlin.[71] This project not only showcased Berlin's potential for a sustainable textile cycle but also laid essential groundwork for integrating recycled products into public procurement criteria.[72]

Public procurement plays a crucial role in advancing these goals. The *Berlin Tendering and Procurement Act* obliges public bodies within the direct Berlin state administration to specify ecological procurement requirements from certain contract value thresholds. The *Administrative Regulation on Procurement and Environment* (VwVBU) further defines performance requirements for specific product and service groups, including workwear. These existing standards are based on the Federal Government's guidelines for sustainable textile procurement and are slightly below the requirements of the Blue Angel certification for textile products.[73] By embedding sustainability criteria in procurement policies, Berlin is

[67] Senate Department for Urban Mobility, Transport, Climate Action and the Environment. (2021). Climate-neutral Berlin 2045. Retrieved from: Berlin.de Website
[68] Senate Department for Urban Mobility, Transport, Climate Action and the Environment. (n.d). Ziele und Grundlagen der Klimaschutzpolitik in Berlin. Retrieved from: Berlin.de Website
[69] Senate Department for Urban Mobility, Transport, Climate Action and the Environment. (n.d.) Berlin Energy and Climate Protection Programme 2030. Retrieved from: Berlin.de Website
[70] Senate Department for Urban Development and the Environment. (2016). Climate-Neutral Berlin 2050: Recommendations for a Berlin Energy and Climate Protection Programme (BEK). Retrieved from: Berlin.de Website
[71] HUMANA. (2024). Nachhaltige Projekte mit HUMANA: 'From Berlin for Berlin'. Retrieved from: HUMANA Website
[72] Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt Berlin. (2020). Dokumentation Fachdialog "Bekleidungsbeschaffung unter Berücksichtigung sozialer und ökologischer Aspekte mit dem Fokus auf zirkuläre Textilien für die öffentliche Beschaffung." Retrieved from: Berlin.de Website
[73] https://www.blauer-engel.de/en/certification/basic-award-criteria

strengthening its commitment to a circular textile economy, ensuring that recycled and responsibly sourced textiles become the norm in public sector purchasing.

4. City-level analysis

4.1. Textile ecosystem

4.1.1 Methodology

Approach

This spatial analysis examines the distribution of key locations within Berlin's circular textile ecosystem and their accessibility to residents. Accessibility refers to the ease with which people can reach a location or 'point of interest' (POI). The analysis follows a structured approach, beginning with the compilation of an inventory of POIs related to the circular textile ecosystem. This is followed by the calculation of travel times to these POIs using open-source road data, considering both walking and driving. Finally, the analysis assesses how many people have good access to these POIs based on population and socioeconomic data, exploring potential links between accessibility and socioeconomic profiles. A more detailed explanation of the methodology is available in the Methodology Document.

Territory inputs

This spatial analysis focuses on the city of Berlin. The selected travel times for walking and driving were determined based on survey responses. The acceptable travel distance to reach a POI is less than one kilometre by walking, which is converted to a travel time of 12 minutes based on an average walking speed of five kilometres per hour. For driving, the acceptable travel distance is approximately five kilometres, corresponding to a travel time of six minutes assuming an average driving speed of 50 kilometres per hour.

Socioeconomic datasets

We used the Index of Social Inequality (*Gesamtindex Soziale Ungleichheit*), which is measured by combining four indicators: unemployment rate, the share of benefit recipients, and the share of children and young people in single-parent households or living in poverty. Neighbourhoods are categorised into very low, low, medium, or high social status based on these factors. The index also accounts for changes in these indicators, classifying them as positive, stable, or negative. For example, a neighbourhood could have low social status but experience positive change. This results in 11 unique status-change combinations, which we assigned to neighbourhoods as categories for a simpler interpretation of the index. For a detailed explanation of how social inequality index scores correspond to analysis categories, see the Methodology Document.

POI collection

To compile an inventory of POIs within Berlin's circular textile ecosystem, publicly available bottom-up sources were collected. Additionally, establishments related to second-hand

clothing shops and textile and apparel repair services were identified through queries to the Google Places API.[74] The analysis focuses on four 'R-categories' of POIs: reuse, repair, rental, and recycle. Reuse locations facilitate textile reuse through selling, exchanging, or giving away used textiles, including second-hand shops, donation points, and clothing swap initiatives. Repair services extend the lifespan of textile products and include clothing and shoe repair shops, repair cafés, and cleaning services. Rental providers offer textile rental services such as clothing and costume rental businesses. Recycling locations involve textile waste management and recycling, including textile collection bins and stores with take-back services.

This analysis is limited to consumer-oriented POIs, considering only locations accessible to the general public. Facilities primarily serving industrial or business purposes within the circular textile value chain, such as sorting facilities, are excluded. Furthermore, the study does not differentiate between specific textile-related products, such as shoes, carpets, clothing, or bags. Depending on the data source, a POI may be classified under multiple categories. For example, a vintage store offering repair workshops is categorised under both reuse and repair, while a collection bin supplying second-hand stores contributes to both reuse and recycling.

POI inventory

A total of 2,165 POIs were found for Berlin (see Table 1). We had two sets of highly detailed bottom-up data, while the rest were extracted using the Google Places API. The first dataset was a map of relevant POIs compiled by Circular Berlin. In addition to common POIs such as second-hand stores and collection bins, this dataset includes a diverse range of locations such as flea markets, sales of leftover fabrics, and numerous POIs offering upcycling and alteration workshops. This variety highlights Berlin as a metropolitan area with a vibrant circular fashion scene and ample locations facilitating reuse.[75] The second dataset was compiled by ReMap Berlin, which contains a similar range of POIs but with fewer data points.[76]

	Reuse	Recycle	Repair	Rental	Total
Count	807	275	1,409	17	2,165

Table 1: Overview of the bottom-up collected points of interest in Berlin.

4.1.2 Results

Accessibility

The analysis reveals clear spatial patterns in the accessibility of circular textile services across Berlin. In general, neighbourhoods further from the city centre have significantly lower

[74] Google. (n.d.). Places API. Retrieved from Google Maps Platform.
[75] Circular Berlin. (n.d.). A-Gain Guide. Retrieved from: A-Gain guide map.
[76] Remap Berlin. (n.d.). ReMap Berlin. Retrieved from: Berlin.de website.

access, while accessibility improves toward central areas—mirroring broader trends seen in other urban amenities (Figures 1 and 2).

The distribution of POIs varies by category. Recycle and reuse POIs are spread relatively evenly across the city but are more concentrated in central districts, with fewer accessible locations in outer areas. Repair services have the highest accessibility overall, with most neighbourhoods enjoying moderate access and central areas showing particularly high concentrations. The number of reuse and repair POIs is noticeably higher than recycling locations, largely due to differences in data sources. The Google Places API, used in this analysis, only captures reuse and repair services, while data on recycling and rental locations is more limited. Despite these variations, accessibility within each category remains strongest in Berlin's central neighbourhoods.

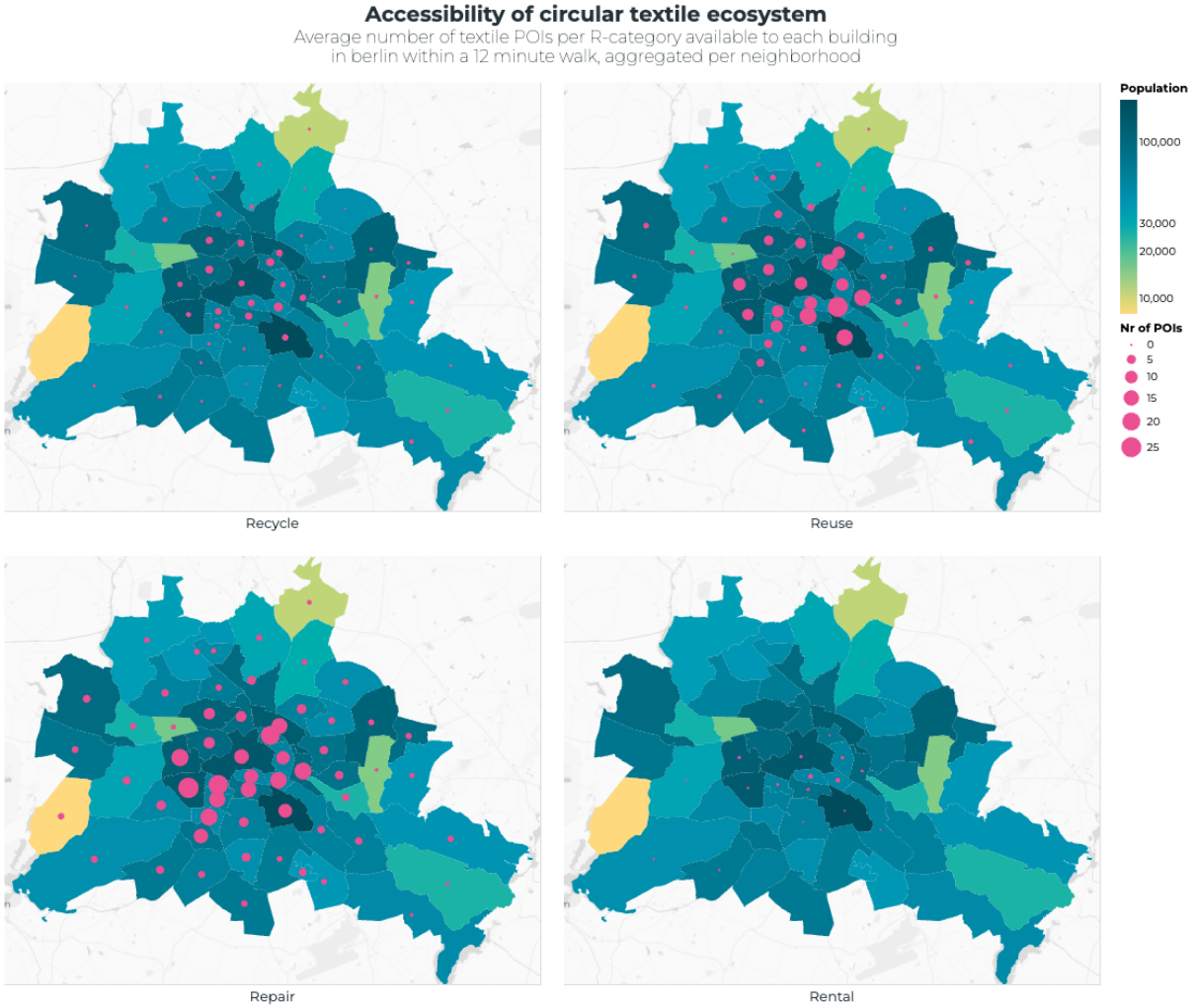


Figure 1: The accessibility maps show the average number of 4R POIs (recycle, reuse, repair, rental) reachable within a 12-minute walk per Berlin neighbourhood. Larger bubbles indicate greater accessibility, while darker shades represent higher populations. The plot compares population and accessibility to reveal spatial patterns or disparities.

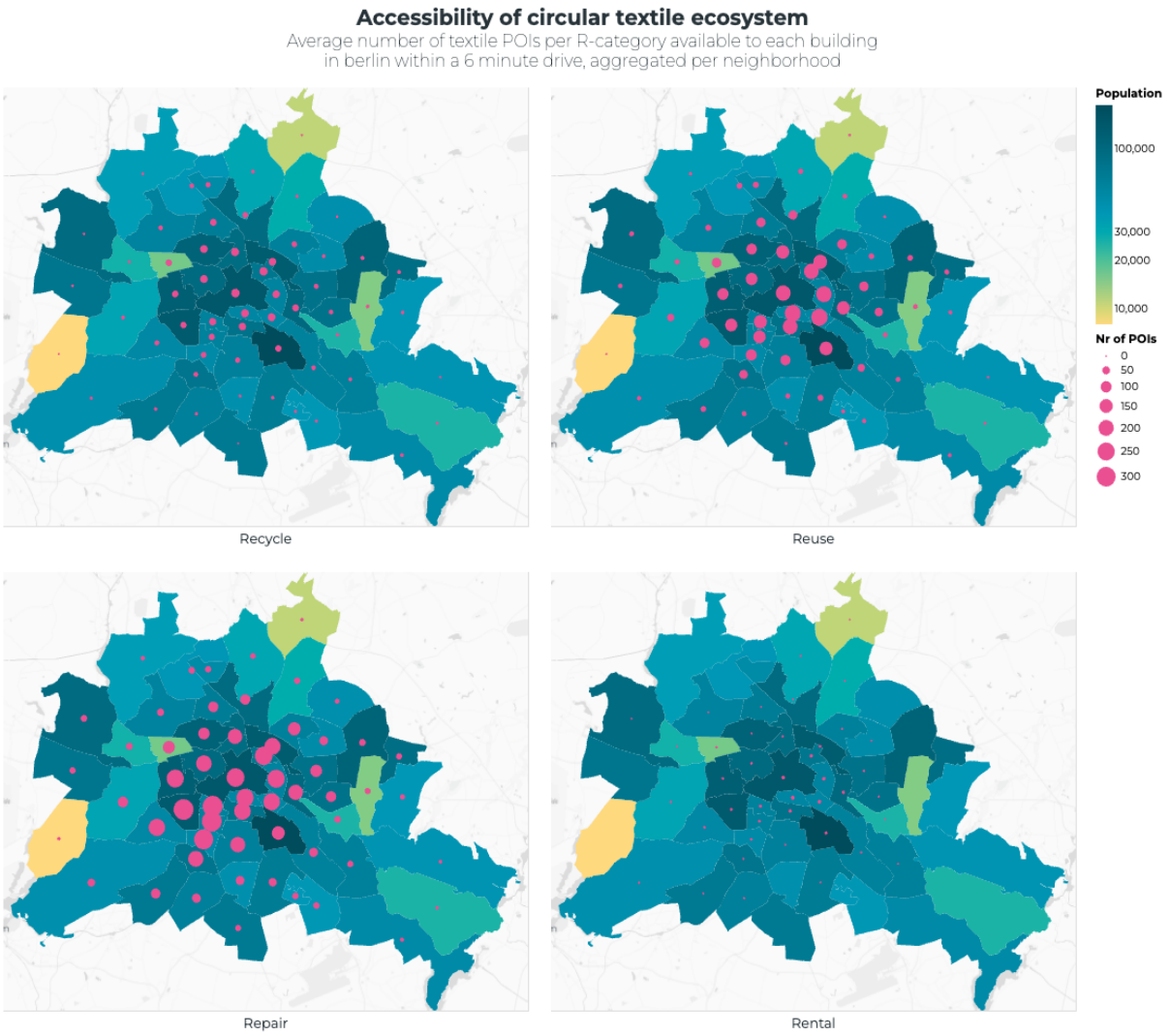


Figure 2: The accessibility maps show the average number of 4R POIs (recycle, reuse, repair, rental) reachable within a six-minute drive per Berlin neighbourhood. Larger bubbles indicate greater accessibility, while darker shades represent higher populations. The plot compares population and accessibility to reveal spatial patterns or disparities.

Travel time

The analysis shows that 50% of Berlin's population can reach at least one circular economy POI within seven minutes and 24 seconds on foot or two minutes and 16 seconds by car (Figure 3). However, accessibility varies, with some residents facing significantly longer travel times—the maximum distance to the nearest POI is 24 minutes by walking and 20 minutes by driving.

When considering access to all four R-categories (recycle, reuse, repair, and rental), disparities remain. Only 8% of the population (313,272 people) can reach POIs from all categories within a 12-minute walk, whereas 54% (2,083,504 people) can access all four categories within a six-minute drive. This highlights the reliance on driving for comprehensive access to circular services in Berlin.

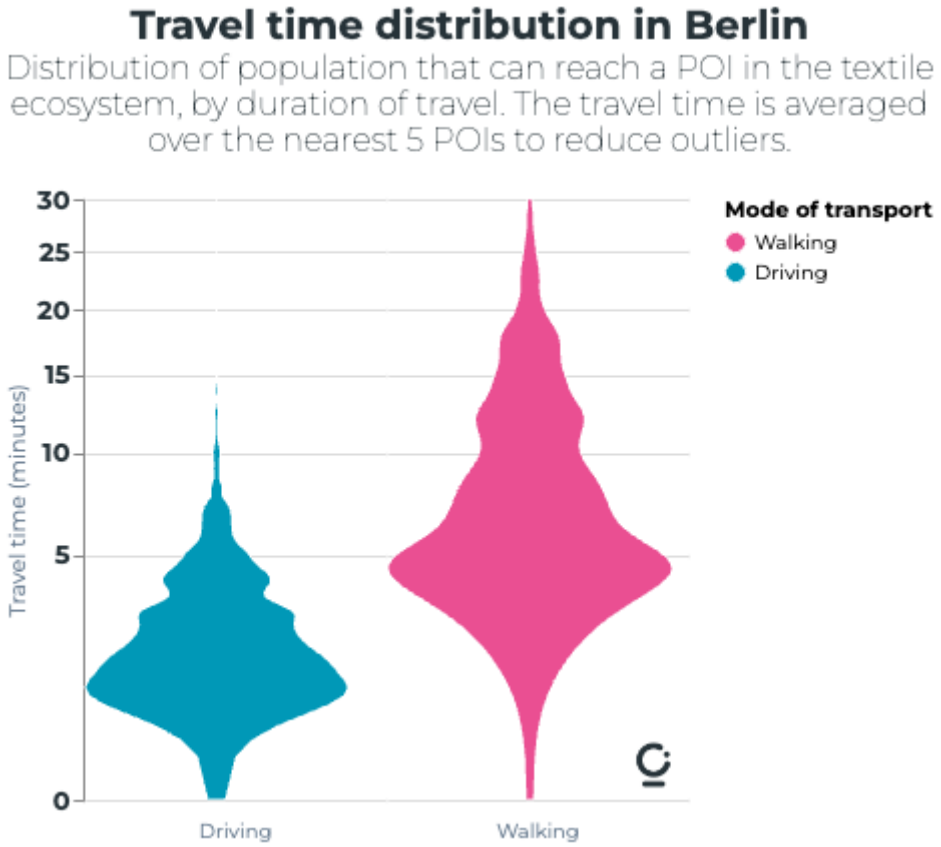


Figure 3: The chart shows the distribution of travel times for Berlin's population to reach a circular textile POI, by driving (blue) and walking (pink).

Socioeconomic factors

The analysis suggests no correlation between social inequality and accessibility to circular economy services (Figure 4). Neighbourhoods with lower inequality are dispersed in Berlin but tend to be located on the city's periphery. As shown in Figure 4, these areas with a social inequality score of around 4, tend to have lower accessibility. Meanwhile, areas with the highest inequality are often observed in the centre or in the north of Berlin, and in contrast these areas experience relatively higher accessibility. This supports the patterns observed in previous sections, with which accessibility appears to be more closely linked to population density than to socioeconomic status.

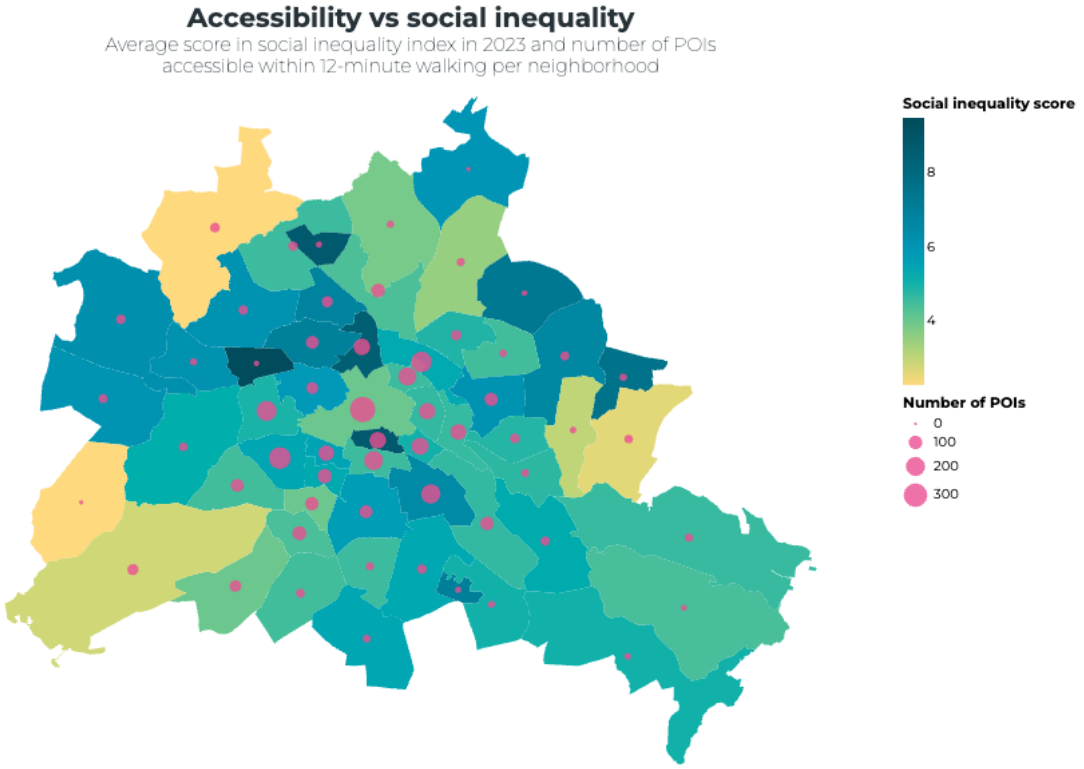


Figure 4: Choropleth and density bubble map showing that lighter shades (low inequality) are in peripheral areas with low accessibility, while darker shades (high inequality) are in central and Northern areas with similarly limited access. Accessibility is more influenced by population density than socioeconomic factors.

4.2 Material Flow Analysis

4.2.1. Methodology

In Berlin, the life cycle of textiles unfolds through five interconnected stages: fibre production, textile manufacturing, distribution and retail, use and repair, and waste management. To provide a detailed view of these stages, a Material Flow Analysis (MFA) was conducted, offering valuable insights into the region's textile flows in 2023. The analysis focused on clothing and footwear, home textiles, and technical textiles. Data on fibre production, textile manufacturing, and repair activities were retrieved using NACE classification codes (see the Methodology Document) for details).

There is no significant production of fibres in Berlin,[77] so it is assumed that all raw materials needed for textile manufacturing are imported from outside the region.

The textile manufacturing stage includes local production for local consumption, exports, imports of textile fibres, and pre-consumer waste generation. While data on traded textiles (classified under NACE codes 13, 14, and 15) is available in mass units from *Amt für Statistik Berlin*,[78] there is no city-level data on manufactured textile volumes. To estimate Berlin's

[77] Data shared by Circular Berlin
[78] Amt für Statistik Berlin-Brandenburg. Aus- und Einfuhr (Außenhandel): Bundesländer, Jahre, Warensystematik. 2023

textile manufacturing output, we downscaled national production data from Eurostat's Prodcom dataset using employment figures in the relevant NACE sectors for both Germany and Berlin.[79] Trade data from the Berlin Statistics Office, reported in total revenue, was used to approximate the volume of manufactured textiles traded in the city.[80]

To estimate textile consumption in Germany, we used the Prodcom dataset,[81] which provides production data in various units (tonnes, kilograms, number of items, and square metres). For items and square metres, average weights per garment were retrieved from Van Duijn et al. (2022),[82] while fabric weights were taken from Huygens et al. (2023).[83] Textile consumption was calculated as:

$$Use = Import_{fin.prod} + Production_{fin.prod} - Exports_{fin.prod}$$

According to Germany's Continuous Household Budget Survey,[84] the average household expenditure on clothing and footwear is similar at both the city and national levels. Therefore, national textile consumption figures were applied to Berlin without further modification. Given the variation in Germany's per capita textile consumption in recent years (ranging from 17 to 24.1 kilograms per capita), the analysis used an average of 2021–2023 figures.

There is no specific data on second-hand clothing within Berlin. However, second-hand sales account for an estimated 11.3% of total textile sales in Germany,[85] and this proportion was assumed to apply to Berlin as well.

Repair and maintenance data from Circular Berlin, including the number of repair shops and the average volume of repaired items per establishment,[86] was used to estimate the total tonnes of textiles repaired annually.

The waste management stage includes both pre-consumer and post-consumer textile waste. Official statistics on post-consumer textile waste collected in the city are available.[87] However, pre-consumer textile waste is not directly reported. To estimate total waste generation, standardised coefficients from the Fiber Conversion Methodology were applied.[88] While the generated volumes are assumed to be sorted, the exact treatment process remains unknown.

[79] Enterprise statistics - regional data. (n.d.). Eurostat. Retrieved from: ec.europa.eu
[80] Amt für Statistik Berlin-Brandenburg. Verarbeitendes Gewerbe (sowie Bergbau und Gewinnung von Steinen und Erden) in Berlin. Jahr 2023. Ergebnisse des Monats- und Jahresberichts für Betriebe
[81] Sold production, exports and imports. (n.d.). Eurostat. Retrieved from: ec.europa.eu
[82] Van Duijn, A., Papú, N., Bakowska, O., Huang, Q., Akerboom, M., Rademan K., Vellanki, D. (2022). Sorting for Circularity Europe. Retrieved from: Fashion for Good website
[83] Huygens, D., Foschi, J., Caro, D., Caldeira, C., Faraca, G., Foster, G., Solis, M., Marschinski, R., Napolano, L., Fruergaard Astrup, T. and Tonini, D., Techno-scientific assessment of the management options for used and waste textiles in the European Union. Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/6292, JRC134586.
[84] Consumption expenditure. (n.d.). Federal Statistical Office. Retrieved from: destatis.de
[85] Umsatzanteil von Secondhandkleidung am Bekleidungsmarkt in Deutschland bis 2027. (n.d.). Statista. Retrieved from: de.statista.com
[86] A–Gain Guide. (n.d.). A–Gain Guide | Map. Retrieved from: https://a-gain.guide/en/map
[87] Stoffstrom-, Klimagas- und Umweltbilanz 2022 (p89). Retrieved from: berlin.de
[88] Textile Exchange. (2019). Fiber Conversion Methodology. Retrieved from: textileexchange.org

4.2.2. Results

Fibre production in Berlin is non-existent, with no significant local output. As a result, it is assumed that all raw materials required for textile manufacturing are imported from outside the region. Regional manufacturing contributes 5.8 thousand tonnes of finished textiles annually, of which 1.5 thousand tonnes are exported.

Textile consumption is substantial, with an average of 21 kilograms per person, amounting to 72.1 thousand tonnes consumed across the city. Repair activities remain limited, with only 0.24 thousand tonnes of textiles repaired each year. Post-consumer textile collection totals 68.7 thousand tonnes annually (18.3 kilograms per capita), while pre-consumer textile volumes are minimal at just 0.4 thousand tonnes.

Of the total post-consumer textile waste, 37.6 thousand tonnes are collected separately, while 31.5 thousand tonnes remain within mixed municipal waste streams and are assumed to be incinerated. For separately collected post-consumer textiles, treatment pathways are more diverse: approximately 19% is reused locally, 23% is exported for reuse, 47% is exported for recycling, 1% is landfilled, and 10% is incinerated. A significantly larger share of post-consumer textile waste is classified for reuse than the amount actually purchased through the city's second-hand market, which is estimated at 7.2 thousand tonnes annually.

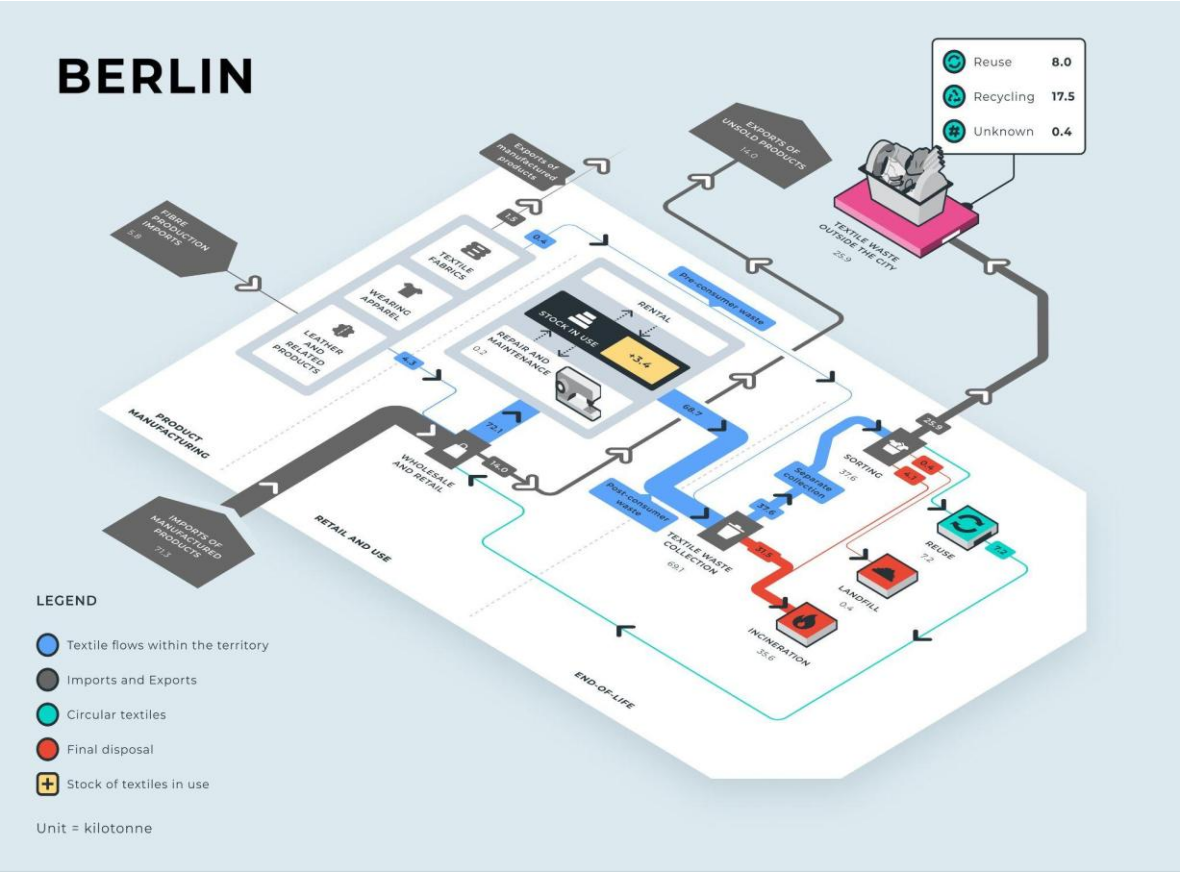


Figure 5: Material Flaw Analysis results

4.3 Employment baseline

4.3.1 Methodology

A variety of sources were used to inform the baseline analysis, with the best available data for 2023 prioritised. City-specific data was utilised whenever possible, such as employment figures from the *Bundesagentur für Arbeit*, which provided insights into manufacturing, distribution, and retail. National data was downscaled to fill gaps in areas like the reuse sector. However, this approach has limitations, as outlined in the following section, and may result in either underestimation or overestimation of employment figures within the sector.

Where direct data was unavailable, estimates were made based on interviews and contextual knowledge. For example, employment in the rental sector was estimated by applying the average number of employees reported by two shops to the entire sector. A similar method was used to calculate employment in textile repair and upcycling. For the collection and sorting sector, it was assumed that a certain number of jobs are required per tonne of waste collected, with employment figures estimated based on the total volume of separately collected textiles.

It is important to note that these estimates were not verified or confirmed by the companies operating in these sectors and should be interpreted with caution. Despite these challenges, efforts were made to use the most reliable sources and methods available for the analysis.

4.3.2 Results

Berlin's textile industry is a significant economic driver, employing an estimated 20,941 people across the value chain. From textile manufacturing to retail and recycling, this sector plays a crucial role in the city's circular ambitions. As the industry evolves to meet sustainability challenges, understanding its workforce and impact is more important than ever.

Fibre production

Berlin does not produce any fibres locally, with fibre production recorded as zero.

Textile manufacturing

The city has a modest manufacturing sector that employs 887 people.[89] This includes 317 jobs in textile manufacturing, 460 in the manufacturing of wearing apparel, and 110 in the production of leather, leather products, and footwear.

Distribution and retail

Wholesale, distribution and retail

[89] Bundesagentur für Arbeit (2023)

The distribution and retail sectors are far more significant, employing 16,233 people in total.[90] Of these, 1,140 work in the wholesale of textiles, while 15,093 are employed in textile retail.

Second-hand retail

In the second-hand retail sector, no city-specific data on second-hand retail employment in Berlin was available. To estimate this, two approaches were used. The first method downscaled the total number of second-hand employees in Germany based on Berlin's share of the national population. This likely underestimates the actual number, as Berlin has a proportionally higher level of reuse and circular activity compared to other regions. The second method scaled employment figures based on Berlin's share of national wholesale trade activity, using the ratio of wholesale trade between Berlin and Germany (approximately 4%) multiplied by the total employment in the second-hand sector in Germany.[91] These approaches yielded estimates of 575 and 588 jobs, respectively, in the second-hand sector in Berlin.

Use and repair

Rental

The rental sector in Berlin includes 16 rental shops, but no comprehensive data on employment within these shops was available. Based on data from two shops that reported an average of two employees each, it was assumed that all rental shops are of similar size and economic activity. This results in an estimated total of 32 jobs in the rental sector, though this number should be treated with caution.

Repair, upcycling and maintenance

The repair and maintenance sector is more established in Berlin. Circular Berlin reported 637 repair establishments and 48 upcycling establishments in the city. Based on survey data, it was estimated that clothing repair shops employ an average of 2.15 people per shop, and upcycling establishments employ 1.8 people per shop. This results in a combined total of 1,456 employees in repair and upcycling. Additionally, data from the *Bundesagentur für Arbeit* indicates 66 jobs in footwear and leather goods repair and 1,623 jobs in the washing and dry cleaning of textiles and fur products.[92] Altogether, the repair, upcycling, and textile care sector employs an estimated 3,079 people in Berlin.

Waste management

Collection and sorting

Employment in the collection and sorting sector was estimated at 135 jobs. This figure was adjusted proportionally based on the volume of textile waste collected relative to the total

[90] Bundesagentur für Arbeit (2023)
[91] Oxford Economics. (2024). *The socioeconomic impact of second-hand clothes in Africa and the EU 27*. Retrieved from Oxford Econometrics
[92] Bundesagentur für Arbeit, 2023

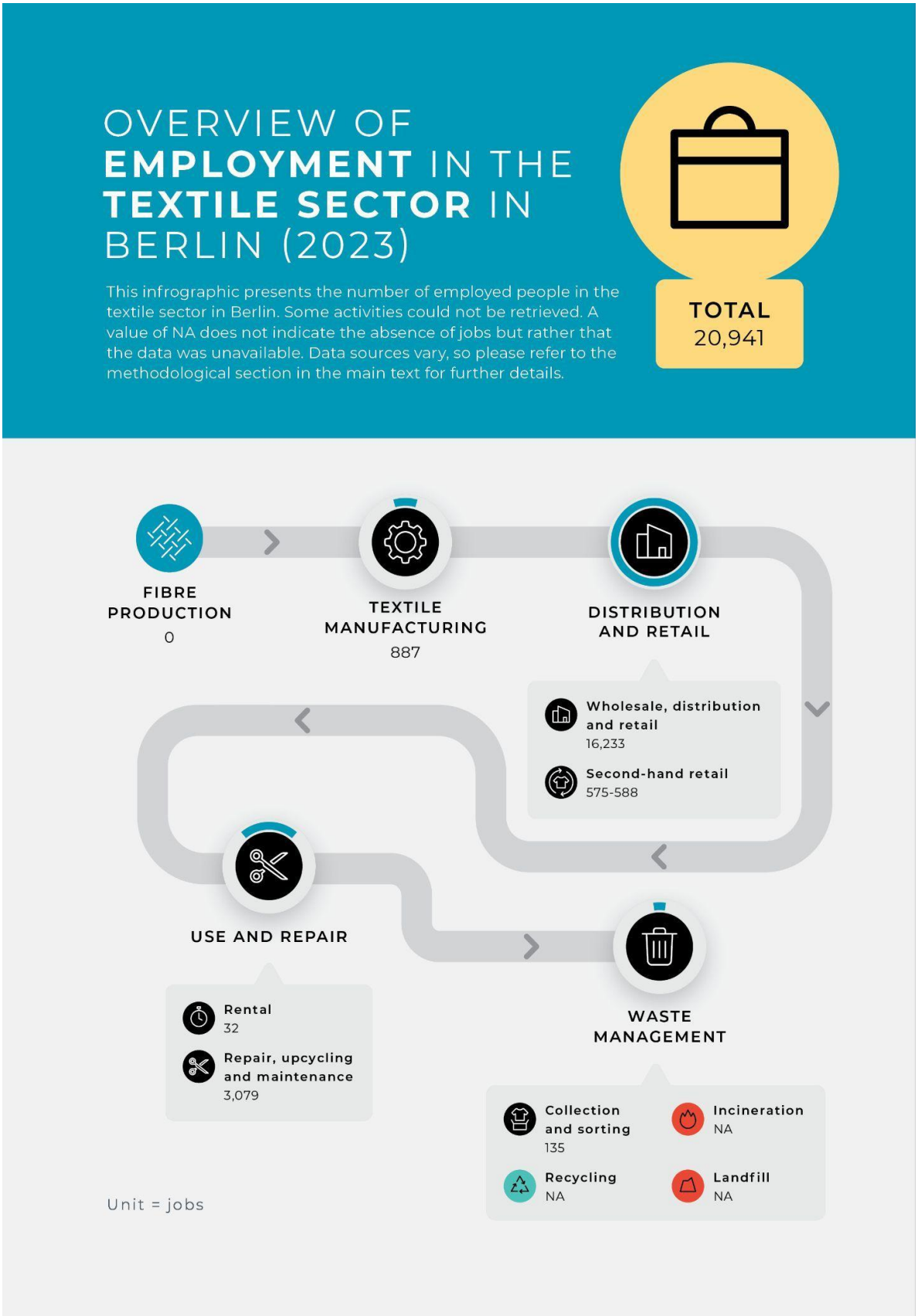
municipal waste generated in Berlin in 2023. However, this estimate could not be verified with surveys or direct input from major collection and sorting companies.

Recycling

Recycling activity in Berlin is minimal, with no significant employment reported in this sector. While startups like Urban Fibres are emerging, their current scale is too small to meaningfully contribute to employment figures.

Landfill and incineration

Data on jobs related to landfills and waste incineration in Berlin could not be retrieved, leaving this aspect unquantified.


OVERVIEW OF
EMPLOYMENT IN THE
TEXTILE SECTOR IN
BERLIN (2023)
This infrographic presents the number of employed people in the textile sector in Berlin. Some activities could not be retrieved. A value of NA does not indicate the absence of jobs but rather that the data was unavailable. Data sources vary, so please refer to the methodological section in the main text for further details.
TOTAL
20,941
FIBRE PRODUCTION
0
TEXTILE MANUFACTURING
887
DISTRIBUTION AND RETAIL
Wholesale, distribution and retail
16,233
Second-hand retail
575-588
USE AND REPAIR
Rental
32
Repair, upcycling and maintenance
3,079
WASTE MANAGEMENT
Collection and sorting
135
Incineration
NA
Recycling
NA
Landfill
NA
Unit = jobs

4.4 Consumer behaviour

4.4.1 Methodology

An investigation into consumer behaviour was conducted, employing a multi-faceted approach to data collection to gain a comprehensive understanding of consumer behaviour regarding circular textiles. A two-pronged method was used: focus group discussions and a detailed consumer survey.

Focus group

The focus group included four industry experts, who provided in-depth insights on their perception of consumer behaviour across Berlin's neighbourhoods. In addition, one further expert interview was conducted with a researcher who had specific expertise on consumer behaviour in relation to sustainable buying in Berlin. The focus groups explored four key themes: purchase drivers (price, brand loyalty, and sustainability); awareness and barriers (understanding of circular solutions and obstacles to adoption); and opportunities for circular textiles.

Survey

A consumer behaviour survey was also carried out. The survey included 390 respondents in total, from 42 of 96 districts in Berlin thereby offering a sample from a variety of Berlin neighbourhoods. The most represented group emerging from the survey was women between the ages of 30 and 39 years. The purpose of the survey was to ensure a more representative consumer perspective. This mixed methodology approach ensured a balanced perspective, capturing both expert analysis and real-world consumer experiences.

To support the development of a circular textiles pilot, an initial assessment mapped consumer behaviour trends in Germany. Key findings included:

- **Rising clothing expenditures**: Between 2015 and 2018, average per-person spending on clothing increased from €854.15 to €941.63, with textile collection rates rising by 2.2%, reaching 15.3 kilograms per person in Germany.[93]
- **Brand loyalty and durability preferences**: Consumers tend to research their purchases, prioritise durability, and remain loyal to brands, making the German market challenging for new entrants.[94]
- **Growing emphasis on sustainability**: Awareness of the textile industry's environmental and social impact is increasing,[95] reflecting a broader shift toward ethical consumption, as seen in the rise of fair trade purchases.[96]
- **Second-hand fashion appeal**: The second-hand clothing market is expanding in Germany, though it is primarily driven by cost and quality considerations rather than sustainability.[97]

[93] Textile Study 2020: "Demand, Consumption, Reuse and Recycling of Clothing and Textiles in Germany"
[94] https://ecommercegermany.com/blog/fashion-ranking-top-20-clothing-retailers-in-germany
[95] https://www.vzbv.de/nachhaltiger-konsum + Nachhaltigkeit ist tragbar- Greenpeace
[96] What You Want to Know About the Sustainable Fashion Market in Germany
[97] Nachhaltigkeit ist tragbar- Greenpeace

- **Trust in eco-labels**: Certifications, particularly those backed by the government or official institutions, play a crucial role in shaping purchasing decisions.[98]
- **Behavioural shift across demographics**: Consumers of all ages are showing a willingness to adopt more sustainable habits,[99] with a 2022 Greenpeace study revealing that, for the first time, sustainability has surpassed price as a primary purchasing factor.[100]

Overall, through insights from the focus group and survey conducted, Berlin emerged as a unique case, distinct from the broader German market. As a hub for sustainable fashion and innovation, the city offers more opportunities for circular solutions, such as second-hand shopping and clothing rental. Neighborhood-specific dynamics significantly influence accessibility, preferences, and trade-offs between convenience, cost, and sustainability. By capturing these insights through focus groups and surveys, the study provides valuable guidance for shaping future pilot initiatives in the city.

4.4.2 Key insights and results

Key drivers and consumer preferences

The study identified both emotional and practical motivations behind textile consumption in Berlin. Consumers are influenced by hedonic drivers, such as peer influence and social media, which often lead to spontaneous, trend-driven purchases. At the same time, utilitarian factors—including price, material quality, and functional use—play a significant role in purchasing decisions. When ranking the most influential factors, price consistently came first, followed by brand reputation and social influence, with sustainability ranking lower in priority.

Second-hand shopping and flea markets are popular choices, but they still face barriers such as hygiene concerns, limited size availability, and the effort required to find suitable items. Clothing donation, on the other hand, is a widely accepted practice, with many consumers viewing it as a meaningful and accessible circular solution. However, rental and repair services remain underutilised due to low awareness and cost-related barriers, making them less appealing options for most consumers.

Neighbourhood dynamics and barriers by solution type

Consumer engagement with circular textiles also varies across Berlin's neighbourhoods and income groups. In higher-income areas, individuals are more likely to engage with circular fashion when it aligns with exclusivity and high-quality offerings. In contrast, lower-income consumers prioritise affordability above all else, making cost the most significant factor in determining whether they engage with circular options. These neighbourhood-specific dynamics highlight the importance of tailoring circular economy initiatives to different consumer segments.

[98] Ethical consumer behaviour in Germany: The attitude-behaviour gap in the green apparel industry
[99] Nachhaltigkeit ist tragbar- Greenpeace
[100] Nachhaltigkeit ist tragbar- Greenpeace

Second-hand shopping is still hindered by stigmas surrounding used clothing, quality concerns, and the time-consuming nature of searching for desirable items. Renting is perceived as expensive and restrictive, with fixed rental periods limiting flexibility. Meanwhile, repair and upcycling face hurdles related to cost, lack of consumer skills, and a general perception of inconvenience. These factors make it difficult for circular solutions to compete with the ease and affordability of traditional retail.

Opportunities for circular textiles

Several opportunities emerged to advance circular textiles in Berlin. Community repair events, such as 'repair picnics' or regular repair cafes, stand out as a means to engage local communities, build skills, and create a more sustainable mindset around textile repair. Mobile swapping events offer an innovative way to reach diverse districts, expanding access to circular textiles. Digital platforms for second-hand and repair services were also identified as key tools to improve transparency and accessibility. Collaboration with influencers targeting younger consumers is another promising strategy to reduce the stigma around second-hand clothing and promote circular solutions.

Key success drivers across consumer groups include financial incentives, tailored communication, and awareness campaigns. Localised efforts, such as using popular spaces for circular solutions and gamification, were also seen as important tactics. Given the diverse consumer preferences across Berlin, solutions should be tailored to specific neighbourhoods. Factors like income, education, and local culture influence consumption patterns, underscoring the importance of crafting targeted, adaptable circular economy initiatives.

4.5. Environmental assessment

4.5.1. Methodology

This chapter estimates the environmental effects of Berlin's textile value chain. Using a life cycle assessment (LCA) approach, the method builds on the results of the MFA, connecting the identified quantities of material flows to their associated environmental impacts. The goal of this assessment is to highlight key priority impact areas within the textiles value chain and lay the foundation for estimating the impact reductions as a consequence of the potential circular pilot solutions. These pilots are co-designed, tested, and evaluated per territory in WP3.

The proposed methodology for this baseline environmental assessment of the current textile flows in each region consists of the following steps (see *Figure ##*): (1) desk research on the environmental impacts of textiles (2) identifying relevant MFA data (selecting the textile flows in scope for the assessment) (3) approximate the composition of the textile flows (4) apply the LCA method to estimate the textile flows' relevant impacts (5) present quantitative estimations on the environmental effect of the to-be-introduced pilots.

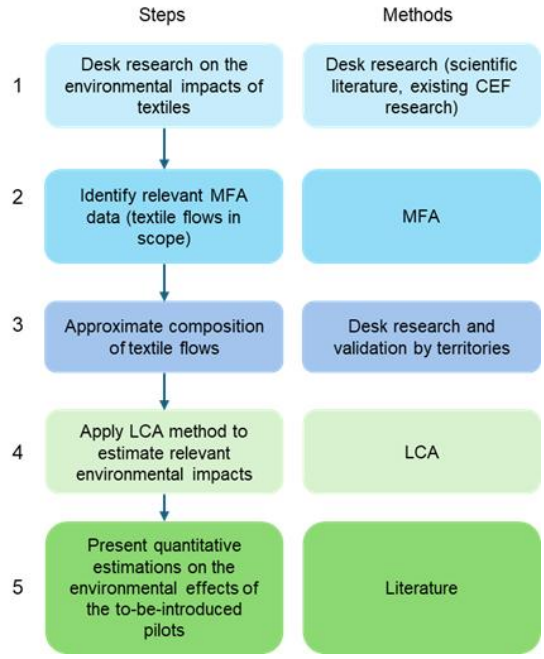


Figure 6: Description of the methodology steps for the baseline environmental assessment

Step 1: An introduction to the environmental impact of textiles

The global textile industry is largely linear: of the 3.25 billion tonnes of textile materials consumed each year, over 99% come from virgin sources, making it only 0.3% circular (Circle Economy, 2024). The textile industry also has a high environmental impact, in particular with high demand for water, land and energy required to produce fibres and textile products: around 4-6 % of the EU's environmental footprint across a range of impact categories is caused by the consumption of textiles, with the large majority of those impacts occurring elsewhere in the world (Köhler et al., 2021). Key impact categories to look at when assessing the environmental impact of textiles are global warming, water consumption, land use change, water and air pollution, and the release of microplastics into terrestrial and aquatic environments.

The textile life cycle stages - not including the use phase - with the highest environmental footprint are typically material extraction, processing, and product manufacturing (Circle Economy, 2024). At the same time, textiles' end-of-life stage is also problematic, as post-consumer textile waste is still largely characterised by incineration and landfilling instead of reuse, repair or recycling pathways. In fact, a large share of used textiles separately collected in the EU and sorted for recycling ends up being traded and exported to Africa and Asia with a highly uncertain fate (EEA, 2024).

Textiles are a heterogeneous group of materials. Clothing and household textile items are composed of a variety of materials, each with highly distinct origins and manufacturing processes, and therefore different environmental impacts. The origin of textile fiber can be natural (cotton, wool, linen, silk), synthetic (polyester, nylon), or semi-synthetic (rayon), with

many textiles being composed of blends between different natural and synthetic fibers. Additives and colouring agents cause additional material complexity. The textile industry is increasingly using fossil-fuel-derived synthetic fibres like polyester, currently making up 63% of the raw materials used in textile production (Circle Economy, 2024).

There are multiple scientific methods to calculate materials' environmental impacts. One of the most widely used is life cycle assessment (LCA), which allows to evaluate the environmental impacts of a product, process, or service throughout its life cycle, from "cradle to grave" (i.e., from raw material extraction through manufacturing, use, and end-of-life disposal or recycling). The LCA process is typically carried out by (1) setting the goal and scope, (2) inventorying data on resource inputs (energy, materials) at each stage of product life cycle, (3) assessing the product's impacts, often expressing them in midpoint indicators[101] such as global warming potential (GWP), measured in CO_2 equivalents, and (4) interpreting the results.

LCA results are often complex to interpret, as most conventional impact assessment methods report on many midpoint impact categories[102]. To produce results that are understandable and in line with policy makers' goals, we propose to select a limited number of impact categories, based on which impact categories are most relevant to the domain of focus. Several existing methodologies and references are available to do so (see Higg MSI tool or Quantis report), and previous work by Circle Economy will be used to align the selected impact areas with (CGR Textiles, CGR Quebec). The selected impact categories on which we present the general impact results for the material types are:

- **Global Warming Potential, expressed in kg CO2e/kg material**
    - The industry contributes almost 3.5% of global greenhouse gas (GHG) emissions linked to climate change, with material production, including fabric and trim manufacturing and finishing, accounting for 55% of the industry's GHG emissions, largely due to energy-intensive wet processing.
- **Energy Use, expressed in non-renewable energy consumption MJ/kg material**
    - As expressed above, various steps of the textiles value chain, in particular fibre production, and product manufacturing and finishing are quite energy-intensive, and to a large degree still rely on fossil energy sources.
- **Water consumption, in m3 water/kg material**
    - Additionally, the industry accounts for 3.5% of the total water scarcity impact caused by all global manufacturing activities, often operating in regions already facing water shortages. Factors such as geographical constraints, population growth, and competing industrial and domestic demands

[101] Midpoint indicators measure environmental impacts in specific categories, such as climate change (GWP), ozone depletion, resource depletion, and others. Midpoint indicators are useful for assessing the relative contribution of different stages of a product's life cycle to specific environmental issues. The midpoint method looks at the environmental impact earlier along the cause-effect chain before the endpoint is reached. For example, the midpoint method might look at the global warming impact, which later on may relate to different endpoint impacts, such as damage to human health or ecosystems.
[102] The ReCiPe midpoint method, for instance, presents results for 18 midpoint categories.

worsen water scarcity. The dyeing and finishing stages of the textile value chain are especially water-intensive, consuming approximately 93 billion cubic metres of water annually (Circle Economy, 2024).

- **Land use change, m2a crop/kg material, and microplastics emissions**
  - Land use change concerns the clearing of native vegetation to establish new agricultural grounds, for example for the production of cotton. Such changes lead to various interlinked environmental issues, such as increased GHG emissions through soil degradation and biodiversity loss. Cotton is also linked to deforestation (Solidaridad, 2023).
  - For synthetic materials, land use change issues are less material, but emissions from microplastics become relevant. While research to include quantifiable midpoint-indicator results for microplastics in the LCA method is very new (TNO, 2024), it is clear that the textile industry significantly contributes to microplastic pollution through materials and embellishments used in garments, such as prints, coatings, buttons, and glitter. Synthetic plastics, including those in textiles, take decades to degrade, particularly in marine environments (Circle Economy, 2024).
- **Marine and freshwater eutrophication, in kg P and N/kg material**
  - Textiles contribute to over 5% of marine eutrophication and over 4% of global freshwater eutrophication, primarily due to fertilizer runoff from cotton farming and the chemicals used in dyeing processes (Circle Economy, 2024).

The impact factors for 1 kg of each fibre type for the different impact categories mentioned above were retrieved using the LCA software SimaPro and the ecoinvent database. For all impact indicators, the ReCiPe 2016 midpoint (H) method was used, except for Energy Use, for which the Cumulative Energy Demand V1.11 method was used. The impact factors are summarised in Table 2 below.

Impact Categories per kg of fibre	Global Warming Potential (kg CO2e/kg)	Energy Use (non-renewable, fossil, MJ/kg)	Water Consumption (m3/kg)	Land Use (m2a crop eq/kg)	Freshwater eutrophication (kg P eq/kg)	Marine eutrophication (kg N eq/kg)
Cotton	12	111	5.52	7.32	0.0093	0.0534
Polyester	5.78	104	0.0389	0.201	0.002	0.000276
Polyamide	9.82	114	0.069	0.00199	0.000294	0.000313
Wool	52.2	N/A	0.851	58.2	0.0126	0.0443
Polypropylene	3.15	87.2	0.011	0.0371	0.000711	0.0000615
Viscose	3.33	36.4	0.0636	0.996	0.00132	0.000123
Acrylic	3.73	81.2	0.0469	0.0342	0.00111	0.00315
Other fibres	N/A	N/A	N/A	N/A	N/A	N/A

Non-textile material	N/A	N/A	N/A	N/A	N/A	N/A

Table 2: Summary of environmental impact factors per kg of textile fibre, per type of textile fibre

Step 2: Identifying the relevant MFA data

The collected MFA data contains estimated textile flows for each region. Several stages of the textile value chain are included, from fibre production, textile manufacturing, distribution, and retail to repair/rental/second hand and, finally, waste management. The granularity of this MFA data—i.e., its availability for different value chain stages—allows quantifying textile flows that are most relevant to Berlin. To combine MFA results with the life cycle impact assessment, we decided to use the post-consumer stage as a reference step of the value chain, therefore the baseline environmental impact factors are multiplied by the total amount of textile waste collected (in mass), which in Berlin amounts to a total of 69.1 thousand tonnes (almost entirely made of local post-consumer textile waste).

Step 3: Approximate composition of textile flows

Virtually no country-level information is available on the composition of textiles. Often, estimations are complicated by different definitions and scopes. Several reports and studies conducted in recent years present different estimations of the composition of textiles in Europe, distinguishing between production, import, and exports of fibres, yarn and textile products. A common finding is that there seems to be a relatively large uncertainty with regards to the exact composition of textiles at these stages (Köhler et al. 2021),[103] possibly due to the fact that textile products are made of blends of different fibres. In recent research by Circle Economy for the JRC[104], 18 tonnes of textile waste across 3 countries (Czech Republic, Romania and Italy) were sampled, it was found that 28.7% consisted of "other blends", with many other composition categories also consisting of textile blends (such as 80-99% Cotton and 40-95% Polyester).

Despite these limitations, the decision was made to use recent data presented in the JRC report by Huygens et al. 2023, as it appeared to be the most robust fibre composition estimation available at the time of the assessment, and it was required to establish a baseline composition estimation. The composition breakdown and absolute figures for Berlin are summarised in Table 3 below and cover over 82% of all post-consumer textile waste collected (in mass), and at least 90% of all fibre types used in the production of textile products used in the EU.[105]

[103] More than 50 % of production, imports and exports of fabrics are undefined with respect to fibre composition.
[104] BAKOWSKA, O., MORA, I., WALSH, S., VAN DUIJN, H., NOVAK, M., CHERUBINI, G., JOSHI, R., MORBIATO, A., VISILEANU, E., VESELÁ, A., RYŠAVÁ, E. and HOLICKY, M., Fate and Composition of Textile Waste from Italy, the Czech Republic and Romania, HUYGENS, D. editor(s), Publications Office of the European Union, Luxembourg, 2025, https://data.europa.eu/doi/10.2760/3332076, JRC141441.
[105] The fibre composition of pre and post-consumer textile waste in the EU is assumed to be representative for the fibre composition in Berlin

Fiber type	Fibre composition of new products	Fibre composition of post-consumer waste	Breakdown of textile waste by type of fibre in Berlin (in thousand tonnes)
Cotton	33.3%	33.7%	23.3
Polyester	29.3%	29%	20.0
Polyamide	7.3%	7.1%	4.9
Wool	3.9%	3.9%	2.7
Polypropylene	3.1%	3.2%	2.2
Viscose	3.1%	3.1%	2.1
Acrylic	2.8%	2.7%	1.9
Other fibres	6%	5.9%	4.0
Non-textile material	11%	11.5%	7.9

Table 3: Summary of the fibre composition in post-consumer textile waste in Berlin

4.5.2. Results

Step 4: Estimation of environmental impacts in Berlin

To produce quantitative results, the MFA data (tons of textile flows) for post-consumer textile waste in Berlin will be used as reference mass inputs to the LCIA, providing insights into the life-cycle impacts of the textile flows relevant to the End-of-Life stage. The reason for selecting this particular stage (instead of production, manufacturing or textiles put on the market) is to be able to conduct some scenarios regarding different post-consumer textile treatments and fates (repair, reuse, recycling, etc.) at a later stage of the project.[106]

The preliminary results of the baseline environmental impact assessment of post-consumer textile flows in Berlin are summarised in Table 4 below. Note that "other fibres" and "non-textile material" are missing more granular information to estimate their respective contributions to different environmental impacts, which is why they were left out of the baseline calculation.

Impact by fibre	Global Warming Potential (kt CO2e)	Energy Use (non-renewable, fossil, GWh)	Water Consumption (hm3)	Land Use (hectares crop eq)	Freshwater eutrophication (tonnes P eq)	Marine eutrophication (tonnes N eq)
Cotton	279.42	717.96	128.53	17044.6932	216.55	1243.42
Polyester	115.83	578.94	0.78	402.80802	40.08	5.53
Polyamide	48.19	155.39	0.34	0.9764731	1.44	1.54

[106] An example of this type of result: based on the literature review and LCA, it is estimated that the secondhand activities in Berlin would lead to a reduced consumption of new textiles products, reducing GHG emissions by X tons CO2e, water consumption by X m3, and land use by X m2a.

Wool	140.67	NA	2.29	15684.318	33.96	119.38
Polypropylene	6.96	53.55	0.02	8.202068	1.57	0.14
Viscose	7.13	21.66	0.14	213.35316	2.83	0.26
Acrylic	6.96	42.09	0.09	6.382062	2.07	5.88
Other fibres	NA	NA	NA	NA	NA	NA
Non-textile material	NA	NA	NA	NA	NA	NA
Total	605.17	1569.58	132.19	33361	298.50	1376.15

Table 4: Baseline environmental impact assessment of post-consumer textile flows in Berlin

While the table above provides quantitative estimates of the life-cycle footprint of different textile fibres, it is worth reviewing what the scientific literature tells us about key environmental hotspots across the textile value chain.

The largest sources of impact occur at the earlier stages of the value chain.[107] [108]

- **Raw material extraction and production** is a major impact hotspot, especially for natural fibres like cotton and wool. At this stage, the main environmental impacts occur in the impact categories of land use and water consumption, but also in the form of pollution like eutrophication due to irrigation runoff and pesticide use. For synthetic fibres, this stage is also an important contributor to fossil fuel extraction and energy consumption (with important associated greenhouse gas emissions) during polymerization processes.
- **Fibre production and garment manufacturing** stages are one the largest sources of impact. At these stages, energy and chemical-intensive processes like spinning and dyeing contribute substantially to GHG emissions, eutrophication. Some waste is already generated at these stages, in particular during garment manufacturing, and is accounted for as "pre-consumer" waste in the MFAs.

Wholesale and retail are responsible for a smaller fraction of the environmental impacts, which at these stages consist mainly of energy consumption and associated emissions, mainly from transport, or during operational phases of retail (e.g. electricity consumption in stores).

Although the **consumption and product-use phases** are outside of the scope of the environmental impact results show in in the table above, it must be noted that, over the long run, they can be responsible for a significant share of water and energy use due to

[107] InvestNL. (2024). Towards a Dutch Circular Textile Industry: Exploring the common thread. Retrieved from: InvestNL website

[108] Gözet, B., & Wilts, H. (2022). The circular economy as a new narrative for the textile industry: An analysis of the textile value chain with a focus on Germany's transformation to a circular economy (Zukunftsimpuls no. 23). Wuppertal Institute

washing/drying processes, and also for the release of microplastics for synthetic fabrics.[109] It is also a step of the value chain which is characterised by short lifespans induced by fast-fashion, which therefore contributes to amplifying the absolute environmental impact of textiles production (as product turnover cycles occur more rapidly, leading to more demand for new products).

Finally, it appears that the environmental impacts associated with **textile waste End-of-Life processes** are relatively small compared to the full life cycle impacts of textiles (largely influenced by production and manufacturing processes).[110] However, due to the large volumes of textile waste and poor End-of-Life management systems, it remains crucial to find circular solutions, like reuse or repair, that aim at minimising new consumption (and therefore, new production).[111] This is the focus of the following step (*Step 5*).

Step 5: Impact reductions as a result of the to-be-implemented circular solutions (pilots)

In WP3, we will utilise the baseline environmental impact results as a reference to conduct a comprehensive Life Cycle Assessment (LCA)-based modelling of the estimated impact reductions that would result from the hypothetical changes in the value chain, tested in Berlin's selected pilot project. This analysis will focus on either of the following R-strategies:

- **Refuse**: Refusing unnecessary consumption is arguably the most effective strategy for reducing environmental impacts. However, this approach involves complex considerations, such as Rebound effects (e.g. reduced consumption may lead to increased spending in other areas), or behavioural change challenges in shifting consumer habits.
- **Reuse**: Reuse strategies offer significant potential for impact reduction, but assessing their true additionality is challenging. As highlighted in a CE Delft report:[112] "It is very uncertain how much less new textiles consumers will buy if they buy more second-hand.
- **Repair**: Extending product lifespans through repair can substantially reduce environmental impacts by delaying the need for new product manufacturing.
- (Optional) **Recycling and other End-of-Life treatment**: While not a primary focus of the pilots, our analysis may touch upon recycling and end-of-life strategies. For instance, we will consider how these approaches can help avoid high-impact disposal methods like incineration, potentially leading to significant environmental benefits.

[109] Huygens, D., Foschi, J., Caro, D., Caldeira, C., Faraca, G., Foster, G., ... & Tonini, D. (2023). *Techno-scientific assessment of the management options for used and waste textiles in the European Union: JRC Science for Policy Report*. Publications Office of the European Union.

[110] InvestNL. (2024). Towards a Dutch Circular Textile Industry: Exploring the common thread. Retrieved from: InvestNL website

[111] EuRIC (2023). LCA-based assessment of the management of European used textiles. Retrieved from: EuRIC website

[112] CE Delft (2022) Milieukundige analyse (quickscan) van textieldoelen I&W en UPV. Access here: link

Work Package 3 aims to provide quantitative assessments and detailed analyses of these strategies, offering valuable insights into their potential for reducing environmental impacts across various product lifecycles.

5. Key findings and recommendations

Berlin has made significant advances in circular textiles by promoting sustainable fashion, supporting startups, and increasing consumer awareness. The city encourages innovative solutions like textile recycling, upcycling, and rental models. However, challenges such as scaling these practices, ensuring supply chain transparency, and changing consumer habits remain. Despite these hurdles, Berlin continues to be a hub for developing and implementing circular textile strategies.

1. Consumption

Germany ranks among the world's largest apparel markets,[113] but household spending on clothing and footwear has declined—dropping to just 3.9% of total expenditure in 2020. Berliners cite price, brand reputation, and social influence as top purchasing drivers, with sustainability trailing behind. Second-hand shops and flea markets are widely used, but concerns about hygiene and sizing remain barriers. Repair and rental services are underutilised, hampered by low awareness (rental) and perceived high costs (repair). Neighbourhood dynamics vary widely: affluent areas engage with circularity through exclusivity and quality, while affordability dominates decision-making in lower-income districts.

Recommendations:

- Tailor circular campaigns and services to neighbourhood-specific behaviours, considering income, education, and culture.
- Leverage Berlin's social fabric by fostering hyper-local circular communities—such as repair collectives and sharing hubs.
- Launch public awareness and education campaigns aimed at reducing textile consumption and promoting sustainable consumption habits, especially in underserved areas.
- Conduct detailed municipality-level analyses to identify underserved areas and guide the equitable expansion of circular services.
- In order to design successful interventions, a design-thinking led process[114] can be applied including outreach to service users and service providers, including surveys and polls on diverse platforms that enable deepening the understanding of specific and localised habits, words, values and practices that make repair in Berlin a unique and essential part of the ecosystem.

[113] https://fashionunited.com/statistics/global-fashion-industry-statistics/germany

[114] To access The Circular Toolbox that guides users through a tried and tested circular innovation process and provides the resources you'll need along the way towards the launch of a circular business model that is financially competitive, impact-driven and delights and engages the user. Access here: link

2. Waste collection and infrastructure

Germany leads Europe in post-consumer textile collection, processing, and exports—and Berlin benefits from this national infrastructure and international trade dynamics. However, like many metropolitan areas, it remains reliant on external providers for downstream treatment capacity. Collection and sorting activities are currently financed through the resale of exported garments, primarily for reuse. Yet this model is under pressure: declining quality of textiles and shrinking demand in receiving countries threaten long-term viability. A financial contribution mechanism—such as a dedicated Extended Producer Responsibility (EPR) system—will likely be necessary. Germany can draw on its established EPR system for packaging to design a more effective and equitable framework for textiles.

Recommendations:

- Design a national EPR scheme that supports local collectors and sorters, taking lessons from packaging sector reforms.
- Implement awareness and education initiatives to clarify acceptable donation standards and the environmental value of proper disposal.
- Secure stable financing for local collectors and sorters and support social enterprises in the sector.
- Conduct detailed mapping of textile waste composition, possibly down to facility-level analyses to identify material composition, volumes and prices of post-consumer and post-industrial waste available and its current destinations to understand in detail current bottlenecks, cost and revenue drivers and opportunities.
- Improve access to capital investment for circular businesses and service providers that the city of Berlin relies on.
- Advocate for favourable tax, trade, and policy incentives to give circular service providers a competitive advantage over linear models and competing EU textile regions.

3. Public awareness of circular services

Berlin hosts a vibrant circular textile ecosystem, with widespread availability of second-hand stores, flea markets, repair cafes, and upcycling workshops. Points of interest (POIs) are well distributed across the city, enabling broad access to circular services. From grassroots collectives to professional circular fashion brands, Berlin's infrastructure is well established.

Recommendations:

- Focus on increasing resident engagement with existing services through citywide campaigns, education, and events.
- Strengthen visibility of circular POIs using digital maps, apps, and signage—especially for new residents and tourists.

- Support collaborations between circular businesses and community hubs to widen reach and reinforce behaviour change.
- Learn from existing best practice in piloting community led repair projects, that build on human-centered design[115].

5. Employment and labour dynamics

The distribution and retail sector is the largest employer across the textile value chain in Berlin, with 16,233 people. Second-hand retail employment is more difficult to quantify, but modelled estimates suggest it supports around 575–588 jobs. Berlin's repair and maintenance sector is particularly well established, with 637 repair businesses and 48 upcycling establishments identified. Collection-related jobs are estimated at 135, though this figure requires further verification. Meanwhile, textile recycling remains in an early stage of development and is currently driven by small-scale entrepreneurial ventures, but

signs point toward growth.

Recommendations:

- Continue to invest in Berlin's repair and upcycling ecosystem through policy support, funding, and public visibility.
- Improve employment data collection across second-hand, recycling, and collection activities to guide targeted interventions.
- Support the development of textile recycling as a viable sector through innovation support and pilot projects.

4. Reducing environmental impacts

Refusing unnecessary textile consumption remains the most effective strategy to reduce environmental impact. While the environmental burden of textiles varies widely by material and impact category—and some, like microplastics, are not yet fully accounted for—early estimates place the climate impact of Berlin's post-consumer textile flows at 605 thousand tonnes of CO2e annually.

Recommendation:

- Maximise adoption of R-strategies (refuse, reduce, reuse, repair, recycle) through infrastructure, education, and incentive mechanisms to meaningfully cut emissions and reduce the city's textile footprint.

These considerations will guide the effective design and rollout of circular textile 4R pilots, ensuring that they meet the needs of Berlin's diverse communities and drive progress towards a more sustainable, circular textile economy.

[115] Innovate UK (2025) Next Door Repairs in Hackney. Access here

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