The Swedish Footwear Industry and Ecodesign

Readiness under the ESPR: Market structure, trade flows, material hotspots and implementation challenge

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Utökad svensk sammanfattning

Denna studie är genomförd av IVL Svenska Miljöinstitutet på uppdrag av Naturvårdsverket. Syftet är att sammanställa data om och kunskaper från den svenska skodonsindustrin. Studien genomfördes mellan oktober 2025 och januari 2026 och är en övergripande studie för ökad förståelse för hur kommande krav inom ekodesign kan komma att påverka branschen. Studien gör inte anspråk på att ge en fullständig eller detaljerad beskrivning och analys av branschen.

EU-förordningen om ekodesign för hållbara produkter (ESPR) syftar till att stärka hållbarheten hos produkter som sätts på EU-marknaden, bland annat genom krav på livslängd, reparerbarhet och återvinningsbarhet. Förordningen trädde i kraft i juni 2024 och textilier är ett av flera prioriterade produktområden. Regelverket innehåller särskilda bestämmelser för mikro-, små och medelstora företag, bland annat genom undantag och senarelagd tillämpning av vissa krav.

Arbetet med att ta fram underlag för att sätta produktkraven för textilier påbörjades redan 2023 och i detta arbete påtalades att skor inte skulle ingå i samma delegerade akt som kläder. Detta eftersom man menade att skor skiljer sig avsevärt från textilier och kläder och att det finns få studier gällande skodons miljöpåverkan. Skodon ingår inte som en prioriterad produktgrupp i Kommissionens första arbetsplan, däremot kommer kommissionen att initiera en studie om skodon i syftet är att avgöra om skodon som produktgrupp ska läggas till i arbetsplanen för ESPR och energimärkning 2025–2030, vid en eventuell översyn av planen under 2028.

I ESPR ingår ett allmänt informationskrav om förstörelse av osålda konsumentprodukter samt ett förbud för förstörelse av osålda kläder, tillbehör till kläder och skodon. Stora bolag omfattas av informationsregleringen från och med 19 juli 2025 och av förbudet om att inte förstöra osålda konsumentprodukter från och med 19 juli 2026. Båda kraven gäller för medelstora bolag från och med 19 juli 2030.

I producentansvaret för textil och skodon i avfallsdirektivet refereras till ESPR och kommande ekodesignkrav som grund när ekomodulerade avgifter tas fram.

Denna studie har sammanställt data över bolag som finns på den svenska marknaden, deras storlek och inom vilken huvudsaklig ekonomisk aktivitet i skodonsnäringen som de är verksamma. Studien har även analyserat import- och exportflöden och uppskattat privatimporten från tredje land samt gjort en övergripande jämförande analys av miljöpåverkan av vanligt förekommande material i skor.

Den svenska skodonsmarknaden

Denna studie visar att den svenska skodonsmarknaden kännetecknas av en stark dominans av mikro- och småföretag (baserat på antalet anställda) i kombination med ett begränsat antal större aktörer med betydande marknadsinflytande. Baserat på tillgänglig statistik för skodonsrelaterade SNI-koder har cirka 95 procent av företagen färre än tio anställda och klassificeras därmed som mikroföretag sett till en av parametrarna i EU:s definition av SMF (2003/361/EG). Detta gäller såväl företag som tillverkar skor som för företag verksamma inom detaljhandel, grossistled och reparation.

De tre SNI-koder som uteslutande avser skodonsverksamhet är tillverkning av skor (15 200), detaljhandel med skor i specialbutiker (47 721) samt reparation av skor och lädervaror (95 230). Enligt studiens genomgång finns 68 företag där tillverkning av skor är primär ekonomisk aktivitet, och totalt 97 företag där tillverkning ingår som primär eller sekundär verksamhet. Detta ska ses i relation till flera tusen företag verksamma inom handel med kläder och skor, särskilt via distanshandel och e-handel.

Marknadsstrukturen speglar ett bredare mönster inom svensk handel, där ett fåtal stora företag, ofta med internationell räckvidd, centraliserade inköpsfunktioner och utvecklade logistiksystem, samexisterar med ett mycket stort antal små företag med begränsade resurser och små marginaler. Skobranschen är i detta avseende tydligt fragmenterad. Många företag säljer skor som en del av ett bredare sortiment av kläder, accessoarer eller sportartiklar, snarare än som huvudverksamhet. I denna studie har fokus dock lagts på de företag där skodon utgör en del av den primära ekonomiska aktiviteten, vilket motsvarar cirka 65 procent av de företag som har ekonomisk aktivitet kopplad till skor.

En viktig metodologisk begränsning är att det i Sverige saknas ett heltäckande register där företag kategoriseras enligt EU:s definitioner av mikro-, små-, medelstora och stora företag, vilka baseras på både antal anställda och ekonomiska nyckeltal såsom omsättning eller balansomslutning (2003/361/EG). I denna analys används därför antal anställda som huvudsaklig indikator, vilket ger en tydlig men ofullständig bild av företagens faktiska ekonomiska kapacitet. Detta innebär att vissa företag med få anställda men hög omsättning kan hamna i en annan kategori än i denna studie.

Marknadens faktiska omfattning och statistiska begränsningar

Den statistiska bilden av den svenska skodonsmarknaden i denna studie underskattar den faktiska marknadsstorleken eftersom företag där skor utgör en sekundär ekonomisk aktivitet inte inkluderas. Studiens analys utgår från primära

SNI-koder. Detta innebär att stormarknader, varuhus, lågprisaktörer och stora e-handelsplattformar med breda sortiment, där skor kan utgöra en betydande volymandel, faller utanför statistiken, trots att de spelar en central roll i konsumentledet.

Konsekvensen är att antalet företag, den totala försäljningsvolymen och den mängd skor som sätts på den svenska marknaden är större än vad officiell statistik och denna studies analyser ger sken av. Detta är relevant i ett ESPR-perspektiv eftersom regleringen riktar sig mot den ekonomiska aktör som placerar produkten på EU-marknaden oavsett om det är den primära ekonomiska aktiviteten eller en sekundär del av verksamheten.

Egenskaper hos den svenska skodonsbranschen

Ur ett livscykelperspektiv är svenska skoföretag i huvudsak verksamma i nedströmsdelarna av värdekedjan: import, distribution, grossistverksamhet, detaljhandel, användning och i vissa fall reparation. Företag som arbetar med råmaterialutvinning, materialbearbetning eller storskalig skotillverkning finns utanför Sverige. Denna struktur är resultatet av flera decennier av globalisering och outsourcing av produktion, där skotillverkning successivt flyttats till länder med lägre produktionskostnader och specialiserad industriell kompetens. Dessa bolag finns framför allt i Asien men även i andra europeiska länder. Viss produktion förekommer i Sverige idag, men den är i huvudsak småskalig och nischad inom exempelvis hantverksmässig tillverkning eller reparation.

Som en följd av detta finns en stor del av den tekniska kunskapen om skokonstruktion, materialkombinationer, kemikalieanvändning och produktionsprocesser utanför Sveriges gränser. Svenska företag är framför allt importörer, varumärkesägare, distributörer eller återförsäljare, snarare än tillverkare med direkt kontroll över produktutveckling och materialval.

Handelsmönster och importberoende

Sverige är en tydlig nettoimportör av skor och skodon, vilket nära speglar situationen inom den svenska textil- och klädindustrin. Data från SCB (se kapitel 2.1 och 3.1) visar att under perioden 2000–2021 har importvolymen nästan fördubblats, från cirka 20 000 ton till omkring 40 000 ton per år. Efterföljande år, 2022–2023, uppvisar en nedgång i importen, vilket sannolikt kan kopplas till en kombination av faktorer såsom hög inflation, minskad köpkraft, geopolitisk osäkerhet och förändrade konsumtionsmönster.

En särskilt relevant faktor i detta sammanhang är framväxten av internationella ultrafast fashion-plattformar och globala e-handelsaktörer som möjliggör direktimport till konsument från tredje land. Dessa plattformar lanserades i större skala på den svenska marknaden under samma period som importnedgången observerades vilket kan indikera en omfördelning av flöden snarare än en faktisk minskning av konsumtionen. Det saknas officiell statistik över volymer och värde på den tullfria privatimporten från tredje land men beräkningar i denna studie visar på att det kan röra sig om 0,5 – 1,8 miljoner par skor under ett år. Dessa siffror ska ses med stor försiktighet eftersom de baseras på data från två större kinesiska e-handelsplattformar samt på uppskattningar om typ av produkter och svenska marknadsandelar.

Baserat på öppna data från SCB som sammanställts i denna studie är de länder som Sverige (2024) huvudsakligen importerade skor från Kina (cirka 33 procent), Tyskland (14 procent) och Polen (8 procent). Samtidigt är Sverige även ett exportland för skor, framför allt till andra nordiska länder. År 2024 gick 26 procent av den svenska skoexporten till Norge och 21 procent till Finland, följt av Polen, Danmark och Tyskland (se kapitel 2.2 och 3.2).

Dessa handelsflöden kan delvis förklaras av centraliserade nordiska distributionsstrukturer, där lager, logistikcentra och grossistfunktioner är lokaliserade i Sverige för att försörja flera nationella marknader. I Norges fall kan även landets ställning utanför EU, med särskilda moms- och tullregler, spela en roll i att göra återexport via Sverige ekonomiskt attraktiv. Likheter i klimat, konsumentpreferenser och modetrender i Norden kan också vara aspekter som förstärker dessa mönster.

När det gäller produkttyper domineras både import och export av tre huvudkategorier enligt CN 64-klassificeringen: läderskor, textilskor samt skor i plast och syntetmaterial. Denna studie visar att de tillsammans står för omkring 90 procent av handeln. Att sammansättningen av import och export är så likartad indikerar att Sverige i stor utsträckning återexporterar importerade produkter, snarare än att exportera skor med inhemskt produktionsursprung.

Komplexitet i material och designutmaningar

Skor är en av de mest materialkomplexa konsumentprodukterna. Ett par skor kan innehålla upp till 30 olika material, valda utifrån funktionella krav på slitstyrka, flexibilitet, komfort, vattentålighet, grepp och estetik. Materialen används i olika komponenter såsom överdel, foder, innersula, yttersula, förstärkningar, lim och sömmar.

Det finns inget enskilt material som kan anses universellt optimalt för nordiska förhållanden. Prestanda beror på hur materialen är framställda, hur de kombineras och hur skon är konstruerad. Exempelvis kan limmade konstruktioner vara

nödvändiga för att uppnå vattentäthet och hållbarhet inom utomhus- och sportsegment, trots att de kan försvåra demontering och återvinning.

Denna komplexitet innebär att trade-offs ofta uppstår mellan olika hållbarhetsmål, såsom modularitet, reparerbarhet, hållbarhet och funktion. Det gör också standardisering av krav och testmetoder särskilt utmanande.

Företagens mognadsgrad inom ekodesign, spårbarhet och DPP

Intervjuer med företag inom den svenska skobranschen visar att arbetet med ekodesign, spårbarhet och livscykelperspektiv varierar kraftigt och inte är tydligt kopplat till företagets storlek. Vissa mindre företag har gjort betydande framsteg inom resurseffektivitet, cirkulära affärsmodeller och transparenta leveranskedjor, medan andra, inklusive vissa större aktörer, ännu inte har full överblick över sina leverantörsled.

För flera företag är märkning av material och komponenter för spårbarhet fortfarande begränsad till vad som krävs enligt gällande reglering. Skillnaderna är även stora när det gäller förberedelser för digitala produktpass (DPP). Vissa företag har påbörjat insamling av data och uppbyggnad av IT-system, medan andra ännu inte arbetar aktivt med frågan.

Denna variation innebär att införandet av ESPR riskerar att slå mycket olika mellan företag, även inom samma storlekskategori.

Miljöpåverkan från material i skodon

Studien innehåller en övergripande och indikativ analys av miljöpåverkan från vanligt förekommande material i skor, baserad på sekundärdata från databaser såsom Ecoinvent. Analysen syftar till att identifiera huvudsakliga påverkansområden snarare än att ge definitiva jämförelser mellan material.

Resultaten visar att läder generellt har högre miljöpåverkan i samtliga valda kategorier jämfört med vanligt förekommande syntetmaterial. Det är viktigt att notera att analysen inte inkluderar produktionen av den färdiga skon, användarfasen eller end-of-life och därmed kan inga säkra slutsatser dras om vilket material som är att föredra ur ett hållbarhetsperspektiv.

Användarfasen framstår som särskilt central. Om ett material eller en sko används dubbelt så länge halveras dess miljöpåverkan per användning, förutsatt att inget nytt material behöver produceras under samma tidsperiod. Detta illustrerar att

livslängd och faktisk användning är avgörande parametrar som bör inkluderas i framtida bedömningar.

ESPR och konsekvenser för den svenska skodonsmarknaden

Enligt ESPR ligger ansvaret hos den ekonomiska aktör som placerar produkten på EU-marknaden. För importerade skor innebär detta att svenska importörer och varumärkesägare bär fullt ansvar för efterlevnad, även när de saknar direkt kontroll över design och produktion.

I praktiken kan ESPR-efterlevnad i hög grad bli en fråga om avtalsmakt, leverantörsrelationer och tillgång till dokumentation snarare än enbart produktinnovation. Förordningen innehåller uttryckliga lättnader för mikro- och små företag samt senare tillämpning för medelstora företag, vilket visar att hänsyn tas till SME:s förutsättningar. Samtidigt innebär kraven på dokumentation, spårbarhet och motivering av destruktion att större företag med etablerade compliance-strukturer generellt har bättre förutsättningar att hantera regelverket effektivt. För mindre aktörer kan detta innebära högre relativa administrativa kostnader och en ökad försiktighet i sortiments- och inköpsbeslut, särskilt i produktkategorier med hög returgrad eller osäker efterfrågan.

Ett av de största praktiska hindren är avsaknaden av standardiserade testmetoder för hållbarhet och prestanda. Utan gemensamma metoder ökar osäkerheten, kostnaderna och den juridiska risken, vilket kan motverka innovation.

Slutsatser och rekommendationer

Den svenska skodonsmarknaden är fragmenterad, importberoende och dominerad av små aktörer med begränsad kontroll uppströms. Även om Sverige bör ha en positiv syn på ESPR bör implementeringen vara försiktig och stegvis för att undvika att undergräva företag som ännu inte har utvecklat fullständiga spårbarhetssystem.

ESPR bör införas stegvis, med initialt fokus på spårbarhet och transparens i leveranskedjorna. De initiala kraven kan fokusera på att dokumentera huvudsakliga skokomponenter, följt av gradvis integration av miljöpåverkan- och hållbarhetskriterier, i linje med lanseringen av digitala produktpass.

Prioritet bör ges till:

1. **Ökad livslängd och hållbarhet** som första designprincip.
2. **Återanvändning, reparation och rekonditionering** före återvinning.

3. **Minskning av materialkomplexitet** utan att kompromissa med funktion.

4. **Successiv uppbyggnad av återvinningskapacitet** för skor.

Slutligen, det behövs mer forskning, fler LCA:er och bättre data för att möjliggöra välgrundade krav och jämförelser. Utan att integrera livslängd och användning riskerar hållbarhetsbedömningar att bli missvisande.

Summary

This study is conducted by IVL, the Swedish Environmental Research Institute on behalf of the Swedish Environmental Protection Agency to gain knowledge of the Swedish footwear industry to understand the impacts and challenges in relation to the upcoming regulations for ecodesign through the ESPR.

The study was conducted between October 2025 and January 2026 and is a general overview of the companies and their current work with ecodesign and preparations for the upcoming regulations, as well as an assessment of the environmental impacts of commonly used materials in footwear. Further analysis and studies should be conducted for a deeper understanding of environmental impacts of materials and products. This was not done in this study due to the short timeline.

The work has primarily been done by analysis of official trade statistics data and published studies. Interviews with six companies in the Swedish footwear industry was also done to assure an updated knowledge on current work connected to ecodesign. A study of relevant requirements in the ESPR has also been conducted.

Results show that Sweden is a net importer of footwear, and imports have doubled over the past twenty years, increasing from around 20,000 tonnes in 2000 to around 40,000 tonnes in 2021. In the following years (2022 to 2023), imports decreased slightly. The Swedish footwear market is relatively fragmented with many small companies and a few larger ones. Production is dominated by international value chains with global sub-tiers on many levels.

Unlike textiles and clothing, shoes can contain up to 30 different materials, and the materials are chosen based on the function of each part of the shoe. There is no single material that is best for the Nordic climate, since performance depends on how the materials are made and used, such as how textiles are woven, how polymers are mixed, and where adhesives are applied. Across the interviewed companies, work on ecodesign, traceability, and life cycle thinking varies widely and is not clearly linked to company size. Some companies have already started taking a more holistic approach and building this work into the organization, while others are waiting for clearer regulations. The same applies to Digital Product Passports (DPP), where some have begun collecting data and setting up systems, while others have not started.

When it comes to measuring the environmental impact of shoes, for example in CO_2 equivalents per pair of shoes, this is not common practice in the Swedish footwear industry today and only a few companies disclose environmental impact. The gap is therefore large, and further work is needed to map out and develop methods for how this can be done. Further investigations into the environmental impact of footwear materials would also be useful to enable comparisons. The results presented in this report were not considering the lifetime of materials, an important parameter for evaluating the actual life cycle impact of different materials. If a material lasts twice as long compared to another material, that material will obviously reduce the environmental impact by half. This applies to

any shoe; if its lifetime is doubled without additional use of resources or emissions, its environmental impact is cut in half. Therefore, considering the lifetime of the materials would be a crucial next step. LCA: s of different types of shoes is also well needed.

The purpose of ESPR is to stimulate improved sustainability on products placed on the EU market. The design of products should be adapted for long use, repairability and recycling e.g. for the circular economy. Requirements on use of recycled materials should be balanced with functional requirements as well as longer user phase as studies show that a longer use phase is the most efficient way to reduce the environmental impact of a product. The question of repairability should also be of interest since this could have a positive effect on the environmental impact of the product and since companies in the Swedish footwear market repair shoes.

Conclusions and Recommendations

The Swedish footwear market is fragmented, import-dependent, and dominated by small actors with limited upstream control. While Sweden should take a positive view of ESPR, implementation must be cautious and phased to avoid undermining companies that have not yet developed full traceability systems.

Priority should be given to strengthening traceability and transparency across supply chains. Initial requirements could focus on documenting main shoe components, followed by gradual integration of environmental impact and durability criteria, aligned with the rollout of Digital Product Passports.

From a design perspective, ESPR requirements for footwear should prioritize durability and longevity as a first step, followed by reuse, repair, and refurbishment strategies. Recycling and recycled content should be phased in gradually, in line with recycling capacity, which currently is an immature market.

Finally, more data and research are needed. Environmental impact assessments for footwear remain rare in Sweden, and more life cycle assessments are required, including water impacts, material lifetimes, and usage patterns. Without incorporating longevity and actual use, sustainability comparisons between materials and products remain incomplete

Terms, abbreviations and their definitions

Term	Definition
CN codes	A CN code (Combined Nomenclature code) is an eight-digit classification code used in the EU to classify goods for customs, statistical, and taxation purposes. It is a fundamental element in international trade within and outside the EU, determining the applicable customs duties and other measures.
DPP	Digital Product Passport (DPP) is part of the Ecodesign for Sustainable Products Regulation, and aims to enhance transparency across product value chains by providing comprehensive information about each product's origin, materials, environmental impact, and disposal recommendations. The DPP is designed to close the gap between consumer demands for transparency and the current lack of reliable product data[1].
Ecodesign	Ecodesign is a holistic approach to designing products and services that minimizes negative environmental impacts throughout their entire lifecycle, from raw material extraction to end-of-life disposal, by integrating environmental considerations from the very start. It focuses on resource efficiency, product longevity, repairability, and recyclability, aligning with circular economy principles to reduce waste and conserve energy.
Ecoinvent	Ecoinvent is a widely used life cycle assessment (LCA) database that provides harmonized and quality-checked environmental data for products, processes, and services across multiple sectors.
EPD	Environmental Product Declaration has been used for voluntary business communication since the 1990's and is becoming a mandatory regulatory requirement for market access across several sectors within the EU. An EPD is a standardized, third party verified document illustrating a product´s environmental impact across the entire life cycle. EPDs are based on Life Cycle Assessments (LCA).
ESPR	Ecodesign for Sustainable Products Regulation[2]
EVA	Ethylene-Vinyl Acetate, a flexible material often used in soles.
FSC-certified	Forest Stewardship Standard is a standard for sustainable forest products, ensuring they are sourced from forests managed with high environmental, social, and economic standards.

[1] EU's Digital Product Passport: Advancing transparency and sustainability | data.europa.eu

[2] Regulation - EU - 2024/1781 - EN - EUR-Lex

Term	Definition
LCA	Life Cycle Assessment (LCA) remains the primary scientific methodology for evaluating the environmental impacts of a product, service, or process throughout its entire lifespan. Often called a "cradle-to-grave" analysis, it tracks everything from raw material extraction to final disposal or recycling.
LWG	Leather Working Group, a global not-for-profit multi-stakeholder organisation working for sustainably produced, sourced and used leather. The LWG standard is continually improved and audits are conducted by impartial certification body LWG Assurance Services.
PEF	Product Environmental Footprint is a standardized Life Cycle Assessment (LCA)-based method developed by the European Commission to measure the environmental performance of a product throughout its entire life cycle. This method is used for measuring, validating and communicating the environmental performance of products within the European Union´s Ecodesign for Sustainable Products Regulation (ESPR).
PFC	Per- and polyfluoroalkyl substances (PFAS), a group of over 10 000 synthetic, highly persistent “forevever chemicals” used to make products resistant to water, grease and stains.
POE	Polyolefin Elastomer. It is a type of thermoplastic material that combines the flexibility and elasticity of rubber with the processability of plastics.
PU	Polyurethane, a versatile polymer used to create durable, flexible fabrics (like faux leather) and rigid foams for insulation, cushioning, and footwear soles.
PVC	Polyvinyl chloride is a widely used, durable, and low-cost synthetic plastic polymer known for its versatility in being made into both rigid and flexible forms. This adaptability, achieved through various additives, allows it to be used in thousands of applications across many industries, including construction, healthcare, and electronic.
SME	Small and Medium sized enterprise.
SNI-codes	The Swedish Standard Industrial Classification, *Standard för svensk näringsgrensindelning (SNI)*, is Sweden’s official system for categorizing companies and workplaces according to their main economic activity.
SSEI	Swedish Shoe Environmental Initiative
TPR	Thermoplastic Rubber, a versatile material blending plastic's processability (like injection molding) with rubber's elasticity, offering excellent grip, impact absorption, and chemical resistance for products like tool handles, gloves, and footwear, while being easily recyclable unlike traditional thermoset rubbers. It's known for its durability, flexibility across various temperatures, and good weathering properties, making it ideal for applications requiring both softness and strength.
TPU	Thermoplastic Polyurethane, a highly versatile elastomer with unique properties that offers superior performance and

Term	Definition
	processing flexibility. TPU is often used in applications in a wide variety of markets, including footwear, adhesives, additive manufacturing and specialty molding.

1. Background

The Ecodesign Regulation for Sustainable Products (EU 2024/1781), aims, among other things, to improve the environmental sustainability of products and reduce their overall carbon and environmental footprint over the entire life cycle. The regulation also contains specific provisions for micro, small and medium-sized enterprises, including exemptions and phased application of certain obligations, reflecting proportionality considerations.

The regulation requires the European Commission to establish a work plan in which, among other things, the product group "textiles, especially clothing and footwear" is mentioned as one of the priorities in the first work plan. In accordance with the priority set out in the work plan, delegated acts featuring detailed requirements for the prioritized product groups (as well as for horizontal aspects) will be developed.

As a first step in the preparation of delegated acts, consultants carry out feasibility studies to inform the Commission. The feasibility study for textiles (Marschinski et al., 2025) began already in March 2023, i.e. before the framework legislation was finalized, and proposed to exclude footwear (as well as home textiles) from the scope of the delegated act, which will then only cover clothing. The feasibility study argues that footwear differs functionally too much from clothing to be included in the same ecodesign requirements, that footwear is less well researched in terms of environmental impacts and that the environmental impacts of the clothes consumed in the EU is higher than the environmental impact of footwear.

The Ecodesign Regulation also includes a requirement for information on the destruction of unsold consumer goods and a ban on the destruction of certain unsold consumer goods, in the first step limited to textiles/ clothing and footwear. The prohibition of destruction applies to large companies from 19 July 2026 and to medium-sized companies from 19 July 2030. The information requirement applies to large companies from 19 July 2025 and to medium-sized companies from 19 July 2030 (art. 24 ESPR). The producer responsibility in the revised Waste Framework Directive (European Parliament & Council of the European Union, 2025) refers to ecodesign requirements for footwear as a basis for eco-modulation of producer levies.

Footwear is not included as a priority product group in the Ecodesign for Sustainable Products and Energy Labelling Work Plan 2025-2030 (European Commission Directorate-General for Environment, 2025) but it states that the Commission will evaluate the potential to improve the environmental sustainability of footwear under the ESPR in a study to be completed by the end of 2027. The work plan mentions the possibility of linking ecodesign requirements to the eco-modulation of producer fees in accordance with the Waste Framework Directive.

Hence the Swedish Environmental Protection Agency has a need for an in-depth knowledge base about the Swedish footwear industry, regarding the market and environmental impact from a Swedish perspective, to identify similarities and

differences at Swedish and EU level. This study is giving an overall analysis of the Swedish footwear industry.

1.1 The purpose of this study

This study investigates the Swedish footwear industry from a market perspective as well as from a product perspective. The purpose is to gain a better understanding of the characteristics of the companies and of the most frequently used materials in footwear products on the Swedish market. This knowledge will help to understand key implications of the proposed Ecodesign for Sustainable Products Regulation (ESPR) for the Swedish footwear industry.

The study highlights specific challenges linked to Nordic climate conditions, complex multimaterial designs, SME supply chains, and upcoming bans on destruction of unsold goods. An indicative analysis of the environmental impact of some commonly used materials has been done to understand hot spots and aspects relevant for products on the Swedish market. Knowledge gaps in the environmental impact of footwear have also been identified.

The study also investigates the current state of the industry´s sustainability work and readiness for upcoming regulations on ecodesign for footwear as well as the preparations for the Digital Product Passports.

2. Method

In this section the methods used in this study are specified and explained.

2.1 The Swedish footwear industry

2.1.1 *Businesses to be included (SNI)*

The Swedish Standard Industrial Classification, *Standard för svensk näringsgrensindelning (SNI)*, is Sweden's official system for categorizing companies and workplaces according to their main economic activity (Statistiska Centralbyrån. n,d-d). These classification codes, referred to as SNI codes, are used to standardize how industries and economic sectors are defined and reported across Sweden. SNI-codes were used to structure the analysis of the Swedish footwear industry, i.e., what type of business is most common, and what is the size of the companies. In this study the version SNI 2007 was used since the investigation was done in November 2025. In December 2025 a new version of SNI codes was launched to align with a new version of the Statistical Classification of Economic Activities in the European Community (NACE, Nomencalture Statistique des activités economiques dans la Communauté européenne). The new SNI version replaces SNI 2007 (SNI 2025).

A search for "skodon" was made in the SNI-definition database (Statistiska Centralbyrån, n.d-c) to find which companies have some activities related to footwear. After discussion with the Swedish Environmental Protection Agency, three economic activities were excluded and one additional was added. The consequence of this selection is that super- and hypermarkets that have shoes as a part of their offer are not included. See Table 1 for a summary.

Table 1 Economic activities included in the analysis based on SNI-codes (SNI 2007)

SNI-code		Skodon search	Included in the analysis
15 200	Manufacturer of footwear	✓	✓
46 420	Wholesale of clothing and footwear	✓	✓
47 721	Retail sale of footwear in specialized stores	✓	✓
95 230	Repair of footwear and leather goods	✓	✓
46 160	Agents involved in the sale of textiles, clothing, fur, footwear, and leather goods	✓	✓
47 820	Retail sale via stalls and markets of textiles, clothing and footwear	✓	✓
14 190	Manufacture of other wearing apparel and accessories	✓	✓

47 912	Retail sale of clothing via mail order houses or via internet		✓
77 290	Renting and leasing of other personal and household goods	✓	
22 190	Manufacture of other rubber products	✓	
28 940	Manufacture of machinery for textile, apparel and leather production	✓	

2.1.2 Number of companies and their size

Företagsregistret is SCB's business register, covering all companies in Sweden that carry out any economic activity (Statistiska centralbyrån, n.d-b). The tool *Räkna antal / Räkna företag* was used to calculate number of companies per economic activity, i.e., per SNI-code as well as the size distribution. The settings below were used:

- *Antalsberäkning eller myndighetsutövning* was used to include all companies.
- *Bransch 1,* i.e., the companies that have an SNI-code /economic activity as their primary business were used for summarizing number of companies as well as their size.
- *Bransch 1+2+3,* i.e., companies that has an SNI-code/economic activity as their primary, secondary or tertiary business was used to get an overview of how many companies in Sweden has this code. The companies that had this as the secondary or tertiary business was later excluded for further investigation.
- Only active companies were included.

The database Företagsregistret (Statistiska centralbyrån, n.d-b) does not currently support analysing the number of companies per size according to the EU SME definition 2003/361/EG (European Parliament & Council of the European Union, 2003) (Table 2). A distribution per number of employees is in place, whereas it is not in place for net turnover. This is further elaborated in the result section.

Table 2 Definition of SME according to the EU SME definition (2003/361/EG).

Do not exceed the limits of at least two of the three criteria (a, b, c).	**Micro**	**Small**	**Medium**
a) Balance sheet	€2 million	€10 million	€43 million
b) Net turnover	€2 million	€10 million	€50 million
c) Max. number of employees	10	50	250

2.2 Trade statistics

2.2.1 Official import and export statistics

Official trade statistics of footwear and parts for footwear (Table 3) were gathered through SCB's database (Statistiska centralbyrån, n.d-a). Data on total import and export (in ton and kSEK), non-response adjusted CN 64 were included.

Table 3 Included CN codes for data on official trade statistics.

CN code	Short description*	Official description (SCB)
64 *Not included in the ESPR***	*Footwear and parts for footwear*	*Footwear, gaiters and the like; parts of such articles*
6401	Waterproof shoes & boots	Waterproof footwear with outer soles and uppers of rubber or of plastics, the uppers of which are neither fixed to the sole nor assembled by stitching, riveting, nailing, screwing, plugging or similar processes
6402	Other rubber & plastic shoes	Footwear with outer soles and uppers of rubber or plastics
6403	Leather shoes	Footwear with outer soles of rubber, plastics, leather or composition leather and uppers of leather
6404	Textile shoes	Footwear with outer soles of rubber, plastics, leather or composition leather and uppers of textile materials
6405	Other footwear	Footwear with outer soles of rubber or plastics, with uppers other than rubber, plastics, leather or textile materials; footwear with outer soles of leather or composition leather, with uppers other than leather or textile materials; footwear with outer soles of wood, cork, twine, paperboard, fur skin, woven fabrics, felt, nonwovens, linoleum, raffia, straw, loofah, etc and uppers of any type of material, n.e.s.
6406 *Not included in the ESPR***	*Parts for footwear*	*Parts of footwear, incl. uppers whether or not attached to soles other than outer soles; removable in-soles, heel cushions and similar articles; gaiters, leggings and similar articles, and parts thereof*

*Short description is developed by IVL as an interpretation of included footwear types.

** CN-code not included in the ESPR but relevant for the understanding of the Swedish footwear market.

2.2.2 Direct import of footwear - estimates

As there is no data source on the total volume of directly imported consumer goods to Sweden from third countries, nor any breakdown by product category, such as footwear, two complementary estimates were derived to illustrate the potential inflow of footwear directly imported to Sweden. These estimates are based on data from Svensk Handel's 2025 annual report on the economic development of the retail sector and the *E-commerce Indicator Annual Report 2024* (Svensk Handel, 2024; Svensk Handel, 2025). These sources include information on cross-border e-commerce turnover (2024) in Sweden, where the reported increase is stated to have likely been driven by growing purchases from low-price actors such as the Chinese platforms Temu and Shein. They also include a survey, conducted by Again Technology in 2024, on Swedish households' purchases from Temu and/or Shein. As these estimates are based on data from two Chinese e-commerce platforms they are not representative of all direct imports via e-commerce from third countries.

Estimate 1

The first estimation approach is based on the turnover data from Svensk Handel, E-commerce Indicator Annual Report 2024 (Svensk Handel, 2024). According to this source, e-commerce purchases from foreign online e-commerce platforms increased from approximately SEK 12 billion in 2023 to SEK 18 billion in 2024. The increase of SEK 6 billion is likely attributed to the Chinese e-commerce platforms Shein and Temu.

To estimate the share of this turnover attributable to footwear, data on cross-border e-commerce by product category are used. Based on data from PostNord (2024) and Handelsfakta (2025), net sales data for Sweden in 2024 are adjusted by excluding product categories not relevant for Temu's and Shein´s product offering (pharmacy, building products and groceries). In addition, sports and leisure products are grouped together with clothing and footwear. Following these adjustments, the combined category of clothing, footwear, and sports and leisure products accounts for approximately 24% of the relevant e-commerce market in Sweden. To further get footwear within this category, retail sales data from Handelsfakta (2025) are used. Total retail sales of clothing in Sweden in 2024 amounted to SEK 66.1 billion, while retail sales of footwear amounted to SEK 6.6 billion. This implies that footwear represents approximately 10% of the combined clothing and footwear market. The estimated turnover attributable to footwear is derived by applying these shares to the estimated turnover associated with Shein and Temu.

To translate turnover into an estimated number of shoes, an assumed price range of SEK 100–300 per pair is applied. This price range reflects the low-price segment characteristic of the product offering on Temu and Shein.

Estimate 2

The second estimation approach is based on data from Svensk Handel (2025) on consumer purchasing behaviors which display that approximately one in five Swedes purchased from Temu and Shein at least once per month in 2024. Using this figure, together with the population of Sweden in 2024, this corresponds to roughly 25 million purchases per year in Sweden.

To translate purchases into parcel flows, the analysis assumes that one purchase corresponds to one low-value parcel. To estimate how many of these parcels contain footwear, the same estimated footwear shares as applied in Estimate 1 (2.4%) are used.

Finally, due to uncertainty in consumer purchasing behavior and packaging practices, the number of pairs of shoes per parcel is assumed to range from one to three pairs.

2.3 Interviews

In total, seven semi-structured interviews were conducted with Swedish shoe companies of various sizes and across different footwear segments. The companies interviewed are presented in Table 4 (placed in order per 2024 turnover).

All interviewees are members of the Swedish Shoe Environmental Initiative (SSEI), which was also interviewed in this study.

The purpose of the interviews was to complement the analysis of the Swedish footwear market, and to gain an understanding of commonly used materials and construction techniques for shoes put on the Swedish market. Additionally, the interviews aimed to capture how companies work with lifecycle perspectives and environmental assessment for shoes, ecodesign and digital product passports. Example, of questions asked during the interviews can be found in Appendix 1.

Table 4 Interviewed companies and role of the interviewee

Company and size	**Role**
Stadium Sweden Aktiebolag *(Large)*	Quality & Sustainability Manager
Nilson Group AB *(Large)*	Head of IT Development & Sustainability, Sustainability Coordinator
Scorett Footwear *(Large)*	Communication & CSR/Sustainability
Icebug AB *(Medium)*	Design & Product Developer

Theorema Skandinavia *(Small)*	Responsible for Production and Environmental, Social, and Governance (ESG)
Kavat *(Small)*	Shoe expert
Swedish Shoe Environmental Initiative (SSEI)	Project Manager

2.4 Environmental impacts

Life Cycle Assessment (LCA) is a standardised method used to assess the environmental impacts of a product throughout its entire life cycle, from raw material extraction to end-of-life. It enables a systematic and transparent evaluation of environmental performance. One way to communicate LCA results in a comparable and verified manner is through Environmental Product Declarations (EPDs).

An Environmental Product Declaration (EPD) is a third-party verified document that clearly describes and presents the environmental impact of a product. EPD International is a programme operator that publishes the EPDs and oversees the overall administration, coordination, and operation of the programme (EPD International AB, 2025).

The environmental impact of leather was received from EPD International, where eleven EPD: s was found. These EPDs were assumed to be material that could be used for shoe production. These results were averaged and presented per kg of material. All leathers were bovine.

The allocation used was specified in the Product Category Rules (PCR): EPD International PCR 2011:13 Finished Bovine Leather (EPD International AB, 2011). Depending on the role of the animal, different products are produced, such as meat, milk, and hides. Because these products come from the same animal, the environmental burden is shared between them in different amounts. The environmental impact is shared between products at the farm and slaughterhouse stages. The farming stage used biophysical allocation (for reproductive mammals 12% for live animal to slaughtering and for non-reproducing mammals 100% is allocated to live animal to slaughtering) and slaughtering used economic allocation (3.5% for hides and skins). The EPDs checked did not mention if the mammals were reproductive or not and therefore it’s not possible to assess what allocation percentage was applied in the farming stage.

Ecoinvent is a global organisation providing an LCA database with over 26 000 datasets (Ecoinvent, n.d). The environmental impact of the other materials in shoes were published by Ecoinvent v.12. A quick literature review showed a lack of public data of the environmental impact of the materials. Thus, Ecoinvent was used for all materials except leather (no available data). Ecoinvent is an LCA-database that requires a license and is therefore not available to the public. The results,

presented in Figure 9-Figure 13 are normalised to the results of leather, since that showed the highest result for all indicators. This means that the result of this material is set to 100 percent and the rest of the materials are expressed as percentages of these results. Presenting the results in this way enables a comparison of the materials without disclosing confidential data. Be aware that for each figure the materials have changed order, so that they are always presented from highest to lowest impact.

2.5 Mapping of ESPR in relation to the Swedish footwear market

The mapping of the ESPR in relation to the Swedish footwear market was carried out through a structured review of the relevant chapters and articles of the regulation, with a focus on how the requirements may translate into practical implications for footwear placed on the Swedish market.

The analysis covered Chapters I-II (general provisions and ecodesign requirements), Chapter III (Digital Product Passport), Chapter V (prioritization, planning, consultation and self-regulation) and Chapter VI (destruction of unsold consumer products). For each relevant article, potentially applicable product parameters, information requirements and administrative obligations for footwear were identified.

Each requirement was then assessed considering Swedish market conditions, including the industry's company structure, its strong reliance on imports, global supply chains, and the position of Swedish actors primarily in distribution, retail and brand ownership rather than manufacturing.

Particular attention was given to how requirements related to performance, material choices, circularity, chemicals, data and documentation may affect actors with limited control over upstream design and production.

Finally, cross-cutting issues and recurring risk areas were synthesized, such as the lack of standardized test methods, data availability in supplier tiers, feasibility for small and medium-sized enterprises, and the implications of the ban on destruction of unsold goods. These insights were used to identify key challenges, knowledge gaps and priority areas for further analysis and policy development.

3. Characteristics of the Swedish footwear industry

Sweden has a long tradition of shoemaking dating back over a century, with many brands rooted in local craftsmanship and functional design, but most of today´s footwear companies are operating through an international value chain where the production is outside Europe. To better understand the characteristics of Swedish footwear companies an analysis of size and economic activity has been done.

3.1 The Swedish footwear companies

SNI-codes were used to structure the analysis of the Swedish footwear industry, i.e., what type of business is most common, and what is the size of the companies.

A company can have more than one economic activity, and for that reason, an initial analysis was done to get an overview of the share of companies that have these SNI-codes as primary business (see definition in the Methodology section). There were 11 575 companies found in total, whereas 65% have this economic activity (SNI-code SNI 2007) as their primary business. Further, only the total of 'Business 1' was used, and thus **the result only includes companies that have the economic activity as primary business.** Thus, companies that have footwear as a part of their business, but not as the primary business, are not included in the results below.

In table 5 below, a presentation of the number of companies registered as primary business as well as economic activity on selected SNI-codes in December 2025.

Table 5 Number of companies per SNI-codes (SNI 2007) (Statistiska centralbyrån, n.d-b).

Description of SNI-codes	SNI-codes	Number of companies with this SNI-code as any business. (Business 1+2+3)	Number of companies with this SNI-code as their primary business. (Business 1)	Business 1 share of Business 1+2+3
Manufacture of footwear	SNI 15 200	97	68	70%
Wholesale of clothing and footwear	SNI 46 420	3 249	2 113	65%
Retail sale of footwear in specialized stores	SNI 47 721	462	321	69%
Repair of footwear and leather goods	SNI 95 230	482	359	74%
Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	SNI46 160	960	681	71%
Retail sale via stalls and markets of textiles, clothing and footwear	SNI 47 820	451	259	57%
Manufacture of other wearing apparel and accessories	SNI 14 190	878	503	57%
Retail sale of clothing via mail order houses or via the internet	SNI 47 912	4 996	3 250	65%
TOTAL		11 575	7554	65%

Since the requirements of the ESPR are different depending on the size of the company, it is important to have an understanding if the companies are Micro, Small, Medium or Large companies.

Companies were further classified according to number of employees (Table 6), due to SCB's database *företagsregistret* Statistiska centralbyrån. (n.d-b) do not yet have a classification per net turnover that matches the EU SME definition (2003/361/EC).

Table 6 Number of companies per economic activity and number of employees. Only Bolag1 are included.

Employees and number of companies with economic activity	nr of employees/ SNI-code (SNI 2007)	0-9	10-49	50-249	>250
Manufacture of footwear	15 200	66	2	0	0
Wholesale of clothing and footwear	46 420	1 941	132	36	4
Retail sale of footwear in specialized stores	47 721	285	29	5	2
Repair of footwear and leather goods	95 230	358	1	0	0
Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	46 160	674	7	0	0
Retail sale via stalls and markets of textiles, clothing and footwear	47 820	259	0	0	0
Manufacture of other wearing apparel and accessories	14 190	498	5	0	0
Retail sale of clothing via mail order houses or via the internet	47 912	3 207	30	11	2
TOTAL		7 288	206	52	8

3.1.1 Insights

Many of the companies included were found to be micro, or small enterprises with few employees. Three of the included SNI-codes work only with shoes, 15.200 Manufacture of footwear, 47.721 Retail sale of footwear in specialized stores and 95.230 Repair of footwear and leather goods. 95% of them are micro businesses.

Within the wholesale and retail industry Sweden has a few large companies, but the main characteristic of the industry is the very large dominance of micro and small businesses.

Sweden is a net importer of shoes (see following section on volumes and products) and that is also seen in the SNI-codes of how many of the different types of companies are active in the Footwear industry.

The total number of manufacturers is 68, whereas retail sale of clothing via mail order houses or via the internet are more than 3000. To be noted are also the other businesses, i.e., many companies both sell clothing and shoes and are also shown to be the dominating group.

In a life cycle perspective, Swedish companies' activities lie mainly within distribution, sale, use and disposal. Companies within raw material extraction, processing, manufacturing are not very common in Sweden today according to the statistics found.

It is important to note that companies with the selected SNI-codes as their secondary economic activity are not included in the results. This means that supermarkets and retailers with a broad product range including footwear are not included. The Swedish shoe market is therefore larger than the numbers presented above. The producer responsibility for textiles covers companies that are defined as producers, i.e. those that offer a product on the market for the first time. This study includes all companies that have economic activities within the selected SNI codes, i.e. also companies that will not necessarily be defined as producers.

3.2 Volumes and products

The Swedish footwear industry is primarily based on production outside Sweden and most of the products are imported to the Swedish market. Data from SCB's database (Statistiska centralbyrån) shows that the import is almost twice the size of the export (Table 7).

Table 7 Average data for import and export of Footwear and parts for footwear, CN64 (SCB)

	Import, kSEK	Export, kSEK	Import, ton	Export, ton
Average 2020-2024	13 322 725	6 150 922	35 517	12 042

Imports and exports of footwear and parts for footwear (CN64) from year 2000 until 2024 are shown in Figure 1 and Figure 2.

There is a decline in both imports and exports 2022-2023 (Figure 1). In this study no deeper analysis has been done to fully understand this but possible causes could be linked to the economic situation (inflation and smaller economic margins for the consumers), post-pandemic effects (such as unsold footwear accumulated in stock) or that international ultrafast-fashion platforms entered the Swedish market around this time.

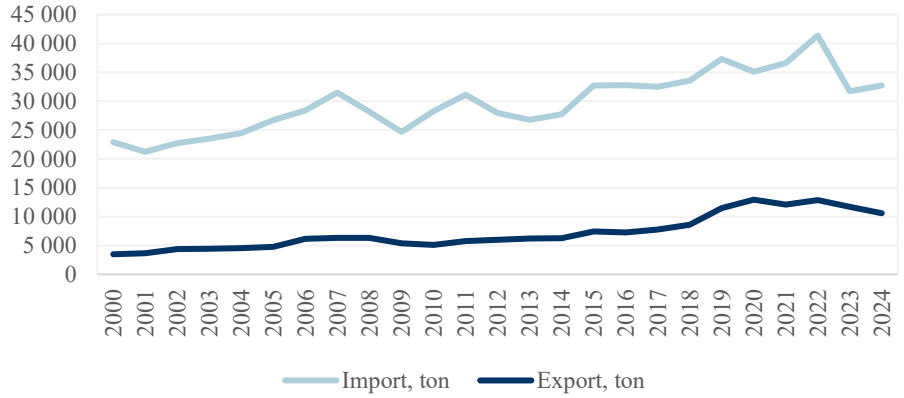

Figure 1 Import/Export (ton) of shoes and shoe parts (CN 64) (SCB)

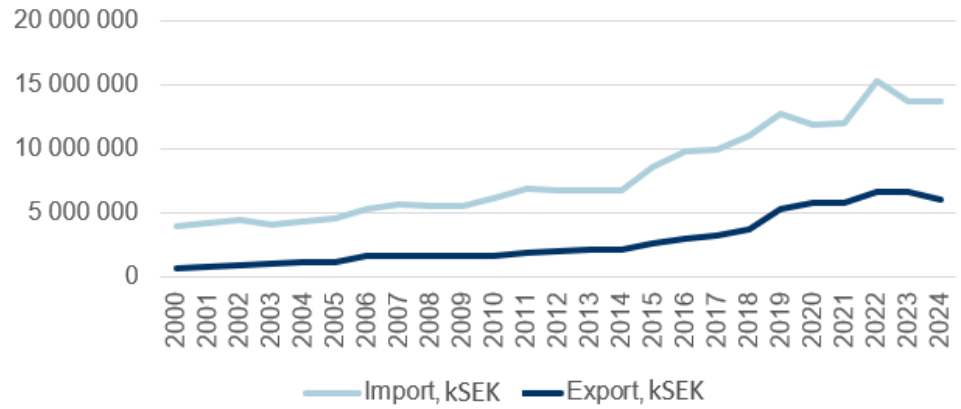

Figure 2 Import/Export (kSEK) of shoes and shoe parts (CN 64) (SCB)

Most of the imported and exported footwear is in the categories “textile”, “leather” and other rubber/ plastic shoes (Table 8). For all data, se Appendix 2).

Table 8 Import/Export (kSEK) of Footwear and parts for footwear (CN 64) (SCB) average 2020-2024

Average 2020-2024	Waterproof shoes and boots (CN6401)	Other rubber & plastic shoes (CN6402)	Leather shoes (CN6403)	Textile shoes (CN6404)	Other footwear (CN6405)	Parts for footwear (CN6406)
Import, ton	2 880	9 001	10 316	11 444	770	1 106
Export, ton	776	2 456	4 632	3 439	481	259
Import, kSEK	356 174	2 511 733	5 205 535	4 719 721	254 716	274 847
Export, kSEK	205 548	915 605	2 905 319	1 803 483	212 579	108 387

China, followed by Germany, Poland and Vietnam are the main countries that export footwear to Sweden. In 2024 the import percentage for the top five countries was China 33%, Germany 14%, Poland 8%, Vietnam 6%, Netherlands 6% and Denmark 5% (SCB's database (Statistiska centralbyrån)). Note that this is the country of dispatch, and thus not the country that produces the shoe or does the final assembly.

Sweden export of footwear and parts for footwear are dominated by European countries, Norway and Finland. In 2024 the export percentage for the top five countries was Norway 26%, Finland 21%, Poland, 15%, Denmark 9% and Germany 8% (SCB's database (Statistiska centralbyrån)).

3.2.1 Insights

Sweden is a net importer of footwear, a situation that closely resembles the dynamics of the Swedish textile industry. Over the past two decades, imports of footwear have nearly doubled, rising from around 20,000 tons in 2000 to almost 40,000 tons in 2021 (SCB's database (Statistiska centralbyrån)). This was followed by a decline in 2022–2023 (Figure 1 and 2), which may be explained by several factors. Like other industries, footwear import, and export may have been affected by inflation, geopolitical uncertainties, and shifting consumer behaviour, including the rise of direct imports from ultrafast fashion platforms, which have contributed to unfair competitive conditions.

Footwear placed on the Swedish market is largely imported, with supply chains dominated by global production networks. Imports i.e., by country of dispatch, from manufacturing hubs and assembly factories often outside the EU. In terms of exports, where Sweden is the country of dispatch, the Nordic countries are leading destinations.

In 2024, Sweden exported mainly to neighbouring countries. This export and trade dynamic can be explained by several factors, one of which could be that wholesalers and warehouses are often centralized in Sweden to serve Nordic consumption. Another, that Norway, not part of the EU, resulting in different VAT rates, which makes re-export through this route cost-effective. Other possible causes could be similarity in trends and climate conditions.

When it comes to the types of footwear imported and exported under the CN 64 classification, leather shoes, textile shoes, and rubber/plastic shoes dominate, together accounting for approximately 90 % of trade. The composition of imports and exports is very similar, meaning that Sweden largely exports the same categories of footwear that it imports.

3.3 Direct import of footwear from third countries via e-commerce

Direct imports of consumer goods into the EU have increased significantly in recent years. Direct imports refer to products purchased from foreign e-commerce platforms where the seller or retailer is located outside the EU (so-called third countries). These products risk bypassing EU product safety and chemicals compliance requirements (European Commission, 2025). A communication by the European Commission on e-commerce says that a total of 4.6 billion low-value items (items under €150) were imported into the EU in 2024 (European Commission, 2025).

At present, data is only available at an aggregated level covering trade between the EU and third countries, or between Sweden and foreign countries (including third countries), and is therefore not representative. Furthermore, consignments with a value under €150 (SEK 1,800) are not covered by official customs statistics, as they are not subject to customs duties (European Commission, 2025). As there is no data source on the inflow of directly imported goods, and no breakdown by product category such as footwear, two complementary estimates were derived to illustrate the potential inflow of footwear directly imported to Sweden from third countries. These estimates are based on data presented by Svensk Handel (2024) and Svensk Handel (2025). The data covers two Chinese e-commerce platforms, Shein and Temu.

- Estimate 1 is based on turnover data from Svensk Handel, E-commerce Indicator Annual Report 2024 (Svensk Handel, 2024). The results reflect the increase in cross-border e-commerce turnover likely attributed to the Chinese platforms Shein and Temu between 2023 and 2024, combined with estimates of the share of footwear within cross-border e-commerce derived from PostNord (2024) and Handelsfakta (2025). See section 2.2.1 for details on the method and data sources.

- Estimate 2 is based on Svensk Handel´s report on the industry's economic development in 2025 (Svensk Handel, 2025), which indicate that one in five Swedes purchases from these platforms once per month. Using this in combination with the population of Sweden, this corresponds to around 25 million purchases per year in Sweden. To estimate how many of these parcels contain footwear, the same estimated share of the footwear as applied in Estimate1, in combination with estimation of the number of pairs of shoes per parcel. See Section 2.2.1 for details on the method and data sources.

3.3.1 Insights

The results for Estimate 1 correspond to approximately 0.5 to 1.4 million pairs of shoes per year. In comparison, the Estimate 2, based on reported Swedish consumption patterns from these two platforms, results in an estimate of approximately 0.6 to 1.8 million pairs of shoes per year.

These estimates provide indicative values and illustrate the potential inflow of footwear directly imported from two Chinese e-commerce platforms. However, since the figures are based on assumptions on the share of Swedish market as well as on the product category footwear, and indirect data, the resulting range should be interpreted with caution. It should also be emphasised that the analysis only includes data from two foreign e-commerce platforms, and the total volume of directly imported footwear is therefore likely to not be representative for the total inflow of direct imported footwear from third countries.

3.4 Interviews

The interviews provided valuable insight for an overview of Swedish footwear industry. The responses from the interviews are summarized under the following four thematic areas on which the interviews were structured.

1. Material use and construction were examined, capturing aspects related to the conditions for shoe design, its complexity, and design for sustainability.
2. Current practices within the organization and future ecodesign needs were explored.
3. Traceability, a life-cycle perspective, and environmental assessment were addressed, including traceability within the supply chain and the level of detail at which information is available.
4. Digital product passports and whether and how companies have initiated this work were asked upon.

In the end of the interview, the work carried out within the Swedish Shoe Environmental Initiative (SSEI) was discussed.

3.4.1 Material complexity, Balancing durability, performance, and sustainability

Unlike textiles and clothing, a shoe can consist of up to 30 different materials, and there is therefore no single dominant material. Instead, material choice depends on the function of each part of the shoe. Synthetic materials are more common in midsoles and outsoles. Midsoles can also sometimes be constructed from bio-based materials. Both synthetic and bio-based materials are used in the upper. Across the interviewed companies, footwear production relies on a mix of synthetic materials

(such as PU, EVA, TPR, ETPU, POE, synthetic rubber and various polymer blends) and natural materials, primarily leather, suede and FSC-certified natural rubber. Leather is often preferred for durability and longer lifespan, provided proper care is maintained.

While some companies use bio-based materials, several of the companies interviewed have chosen not to do so because of trade-offs in durability and product lifespan. However, the application area for bio-based material in shoes varies depending on the technical requirements. Examples of bio-based materials that have been tested for use in uppers but did not meet quality requirements include pineapple- or apple-based alternatives. Materials tested for soles include, for example, sugarcane-based materials and industrial corn, which were able to meet the requirements for this application.

For shoes to meet durability and lifespan requirements, materials are commonly modified and combined. It is very common that leather is coated with PU to achieve sufficient performance properties, such as improved abrasion resistance and protection against moisture. Synthetic and polymer-based materials are also frequently blended or layered, for example EVA combined with TPR to balance low weight, grip, and flexibility.

Restrictions of used materials often focus more on chemicals than material. All companies restrict PVC due to chemical risks, traceability challenges, or inconsistent quality. Companies also focus on solutions free from PFCs (per- and polyfluoroalkyl substances). Other avoided substances and/or materials are those restricted by regulatory compliance legislation.

Material performance in Nordic conditions places specific demands on cold resistance, water protection, and durability to harsh environments. Materials used for this include EVA, which provides low weight, while TPR and rubber offer the grip and abrasion resistance needed for cold, wet, and icy environments. Waterproof materials and membranes are important features for making shoes waterproof, where the membrane is placed on the inside of the upper. Construction methods such as seam sealing, taping, and preventing water ingress are also used. Lightweight polymer foams and PU also require careful formulation to avoid cracking in cold climates. Ice studs are also recurring in the product range, either integrated into the shoe or offered as add-on accessories.

Construction is dominated by cemented methods across the interviewed companies, particularly in the sport and sneaker segments, as they allow faster production and lower weight. Modular or repairable solutions are rare and are mainly limited to replaceable heel components or a small number of high-end products. No shoe models are fully stitched, and adhesives are always used. In most cases, the sole is glued to the upper, while different parts of the upper itself may be stitched together. Other construction methods mentioned include direct injection, strobel, and vulcanized. Traditional stitched shoes are cited as examples of footwear that can be dismantled and easier repaired, but these belong to a different market segment (higher end) that don’t always fulfil technical performance of for example outdoor and sport shoes, or harsh environments, as in the Nordics.

The evaluation and selection of materials is carried out through a combination of technical tests, sustainability assessments, and practical use (user testing, customer complaints, etc.). Waterproof models, for example, undergo freeze tests and flex tests in cold climates. Slip resistance is also assessed.

Overall, it cannot be said that there are specific materials that are generally best suited for the Nordic climate. Instead, it is emphasized that the performance of materials depends on how they are constructed, for example how textiles are woven or how polymers are composed, and how and where adhesives are used.

Looking ahead, the interviewed companies expect current material and construction methods to remain the same, with gradual increases in waterproof designs, lightweight EVA-based soles, and integrated grip technologies. Further, the industry changes to increase the use of mono-materials across a shoe.

3.4.2 Current focus in Ecodesign and Future needs

The interviewed companies' Ecodesign activities today focus mainly on reducing material complexity where possible, extending product lifespan and improving durability. Many companies use customer complaints, wear tests, and in-store feedback to identify weak points in design, for example avoiding fragile components such as zippers in high-stress areas. The focus is generally on working high up in the waste hierarchy by minimizing material use, innovating the design, and supporting customers during the use phase by encouraging them to rotate their shoes, ensure proper care through offering of repair kit and exchangeable insoles or other possible parts.

Other emerging circular measures mentioned by the interviewed companies are design for repair of some parts, as well as business models for reuse (own channels or via online platforms for used products like Tradera, Vinted, Blocket and others).

When it comes to end-of-life, the recycling capacity for footwear is widely described as very limited. Most of the companies interviewed see no functioning recycling system today and consider footwear recycling highly challenging. This is mostly because shoes contain many bonded materials that make mechanical separation and material recovery difficult. Recyclable materials are of interest, but their overall use in footwear production remains low. Examples of recycled materials used today include post-industrial EVA, recycled wool, and recycled PET bottles. However, their use is greatly restricted by the current market for recycled materials as well as the technical feasibility of meeting durability standards for footwear. Looking ahead, the focus to spur the use of recycled materials in shoes must be on identifying which materials, components, processes, and the technical and economic potential are most suitable to start with.

The limitations in end-of-life handling of footwear underline the importance of how future ecodesign requirements are designed. However, these requirements also need to balance several conflicting objectives and trade-offs, particularly between increasing ease of disassembly and extending product lifespan. For example, interviewees highlight that designs intended to facilitate repair or improve recycling can reduce comfort, performance, and durability. If shoes wear out faster

or become less comfortable, the environmental impact per use can actually increase.

Across the companies interviewed, knowledge of the forthcoming ESPR varies. Some of them follow updates through industry networks and show interest in upcoming requirements by exploring areas such as reuse and digital product passports. Others report limited engagement and await clear guidelines or confirmed requirements and thus wait to invest resources in a direction that may later change. Regarding self-regulation measures according to ESPR article 21 within this field, this is not anything currently taking place, internally or externally.

3.4.3 Traceability, lifecycle perspective and environmental assessments

Traceability practices differ across the companies interviewed. Some maintain detailed information of materials for substantial parts of shoes. Others have limited data and focus on main components subjected to mandatory labelling in a shoe (upper, lining, insole, outsole) but lack detailed information for hidden parts like toe caps, midsoles, heel counters or reinforcements. Various certifications are used, for leather some companies often referred to LWG, and many of them were aiming for or achieving Gold. The EU Ecolabel for Footwear is also mentioned, but it is currently only used by one of the interviewed companies.

The Swedish footwear market is largely dominated by outsourced production. Suppliers are geographically spread, with many companies sourcing from manufacturing hubs in China, Vietnam, Bangladesh, Portugal, Italy, and other parts of Europe. The supply chains are often complex, involving multiple sub-tiers of suppliers and subcontractors, which increases the challenge of achieving transparency and traceability.

Long-term supplier relationships and production help build transparency across supply chains and tiers. Dialogue with suppliers increasingly involves requests for more detailed data, and due to the complexity of supply chains this becomes a time- and resource-consuming process. It also raises questions about systems for data documentation and storage, as well as the management of data and updates.

Challenges mentioned by interviewees in the ongoing work to increase traceability include workloads, risks of exposing sensitive supply chain information, and varying levels of traceability across different regions, all of which make the process demanding and time-consuming.

Regarding environmental assessments, the use of LCA varies. Most companies do not conduct LCAs or other environmental assessments, while others apply tools such as Higg MSI to quantify the environmental impact of materials. Some companies are front runners in this area and request LCAs from their suppliers, primarily for materials, which are then used to calculate the environmental impact, particularly the climate footprint, of a pair of shoes.

3.4.4 Implementation of product passports

The companies interviewed are at very different stages in preparing digital product passports. Some have already implemented product passports on a wide scale, or done pilots on several shoe models, developing internal systems to collect and structure required data. Others have started to conduct small-scale tests, while some have not yet begun implementation and are waiting for regulatory guidance. Three companies that have implemented product passes are Icebug, Scorett, and Nilsson Group (Table 9). Stadium has also initiated the development of product passports for its sports assortment, but footwear has not yet been included.

Table 9 Example of companies working with digital product passports for footwear

Company	Year	About the product passport	Type of attachment
Icebug	2021	Product Footprint is developed and continuously updated. Information about country of production, production facility, chemical compliance, material composition per part, weight, care advice and climate impact. The climate impact includes percentage of biobased materials, kg CO_2 equivalent per pair, as well as percentage of recyclable materials used in the shoe (Icebug, n.d).	Laminated QR code label is placed on the shoe tongue. The QR code is also printed on the shoe box.
Scorett	2024	Product passports have been implemented on some products and, in 2026, up to 80 shoe models will be included. Information about country of production, production facility, chemical compliance, material composition per part as well as type of transportation, weight and care advice (Scorett, n.d).	The QR code can be attached either by glue or stitched seams and placed on the shoe tongue, the insole, or another easily accessible internal surface. The QR code is also printed on the shoe box.
Nilsson Group	2025	Product passports have been implemented on some products, and, in 2026, it will be expanded to up to 50 shoe models. The information system is a self-developed DPP solution, chosen because it is the fastest and most flexible option. Information about production country, material and care advice is available (Nilson Group, n. d).	The QR code may be applied using an adhesive label or a sewn-on label and can be placed either on the shoe tongue or on other internal parts of the shoe. The QR code is also printed on the shoe box.

The content of the product passport is largely similar, but the level of detail varies. Differences include how much information is provided about the country of production, the materials used in each part and their suppliers, and whether environmental impact data is included. Icebug has included CO_2-equivalents per pair of shoes. The information is available at product level on their webpage. Behind the quantification of environmental impact lies a combination of different

methods to assess the impact. Including environmental impact information is also mentioned as something that Scorett and Nilson Group aim to do in the future but is currently restructured by the availability of the necessary data. The type of attachment varies, with the QR label either placed on the shoe tongue using glue or lamination or integrated into seams by stitching. The QR code is also printed on the shoebox. Several companies that have sold shoes with product passports also report that customers are often unaware of them, and that this is currently more of an industry-facing tool than a consumer-driven feature.

The main challenges mentioned regarding digital product passports concerns data collection, system integration, and physical marking of products. Placement of the label is also mentioned to be difficult, and there is uncertainty about the durability of QR codes or adhesive labels when exposed to moisture and abrasion.

As a first step, several interviewee's proposed that, product passport for shoes as part of ESPR should focus on starting building documentation and systems for the mandatory major material components in shoes, with the information made available on company websites, digitally, rather than requiring physical labels on all products. Further, several companies emphasize that the forthcoming DPP requirements for footwear must be clear and cannot become administratively burdensome. It is also important that all companies are subject to the same requirements, both to enable the industry to drive change and to avoid creating unfair competitive conditions.

3.4.5 Swedish Shoe Environmental Initiative (SSEI)

Across interviews, companies credit SSEI for enabling them to interpret and clarify unclear regulatory requirements and for providing a neutral space to exchange knowledge with competitors. The initiative has supported several actors in improving environmental performance and helping the Swedish shoe industry navigate regulatory and technical transitions particularly because legislation is often textile-centric and does not reflect the complexity of footwear.

3.5 Insights

Unlike textiles and clothing, shoes can contain up to 30 different materials, and the materials are chosen based on the function of each part of the shoe. There is no single material that is best for the Nordic climate, since performance depends on how the materials are made and used, such as how textiles are woven, how polymers are mixed, and where adhesives are applied. Across the interviewed companies, work on ecodesign, traceability, and life cycle thinking varies widely and is not clearly linked to company size. Some companies have already started taking a more holistic approach and building this work into the organization, while others are waiting for clearer regulations. The same applies to Digital Product

Passports (DPP), where some have begun collecting data and setting up systems, while others have not started.

4. Environmental impacts relevant for the eco-design requirements

Shoes are complex products with a mix of materials and construction methods to ensure the right performance and functionality. Sweden has four yearly seasons with a broad variation of temperatures and weather conditions over the country, even though the same season. The products on the Swedish market include light summer sandals to complex winter boots for minus 30 degrees Celsius in snowy and icy conditions.

To better understand the environmental impacts of footwear, this study includes the indicators in Table 10. The impact categories were selected because they represent the most significant impact pathways for the materials examined. The methane emissions from livestock and the fossil-energy-intensive production of plastics are captured by climate change. Ammonia, nitrogen and phosphorous releases from chemical production and fertilizers are well captured in eutrophication and acidification. The impact assessment used is EF v3.1 (European Commission, Joint Research Centre, 2022). It is developed by the European Commission to provide a common set of impact categories and rules to ensure results are consistent, transparent, and comparable across studies.

Table 10 Impact categories used in the report and their methods

Impact categories	**Methods [unit]**
Climate change	EF v. 3.1[kg CO2e]
Eutrophication, freshwater	EF v. 3.1[kg P eq.]
Eutrophication, marine	EF v. 3.1 [kg N eq]
Eutrophication, terrestrial	EF v. 3.1 [mol N eq]
Acidification	EF 3.1 [mol H+ eq.]

Water deprivation was decided to be left out since no regionalisation is performed for results directly from Ecoinvent's website. Without the regionalisation of water use the results are not useful.

The results of the environmental impacts of the materials are presented in Figure 5-9. As was explained in Section 2.2, the results were normalised to the results of leather. The materials in this study have been chosen in dialogue with the Swedish Environmental Protection Agency. The results for climate change, fossil is presented in Figure 5. This report focused on fossil carbon and not biogenic carbon.

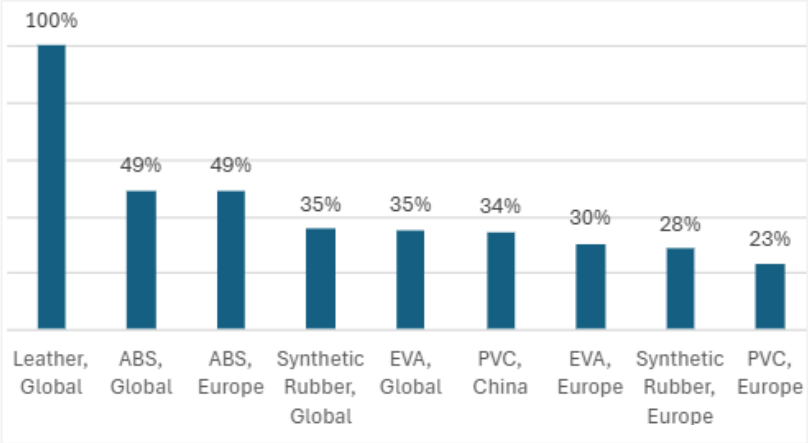

Figure 5 Presents the results for climate change, fossil impact for the materials, expressed as percentages

The results for climate change, fossil show that leather has the highest environmental impact, followed by ABS (global and Europe), synthetic rubber (global) and EVA (global). PVC Europe shows the lowest climate change impact.

The result for freshwater eutrophication is presented in Figure 6.

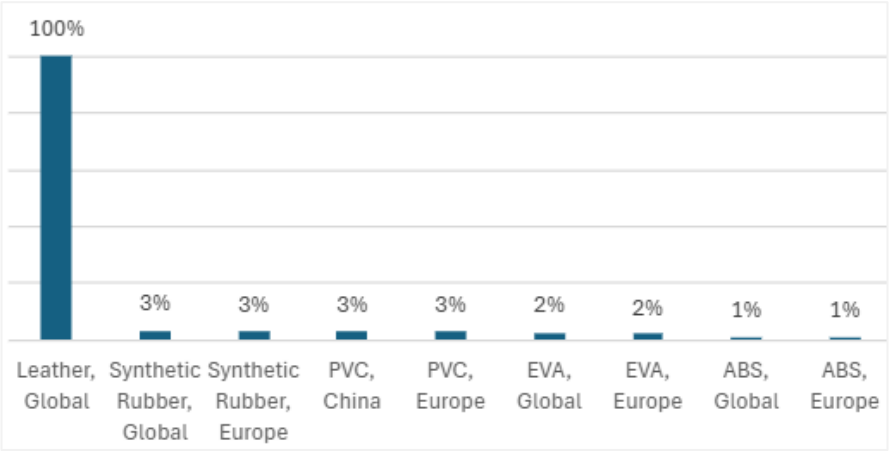

Figure 6 Presents the results for eutrophication freshwater impact for the materials, expressed as percentages.

The results show that leather has the absolute highest impact. ABS, Global and ABS, Europe show the lowest impact.

The result for marine eutrophication is shown in Figure 7.

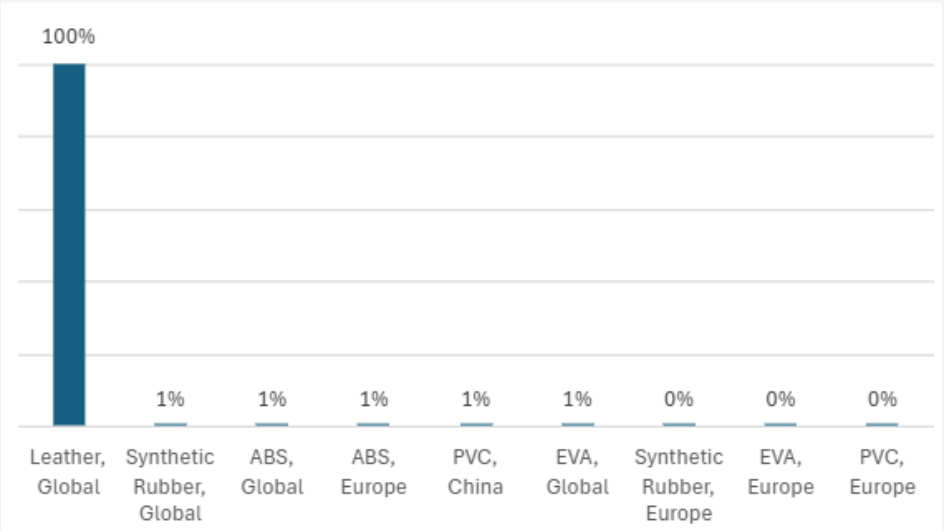

Figure 7 Presents the results for eutrophication marine impact for the materials, expressed as percentages.

The results show once again the highest impact on leather. EVA, Europe and PVC, Europe show the lowest impact for marine eutrophication.

The result for terrestrial eutrophication is shown in Figure 8.

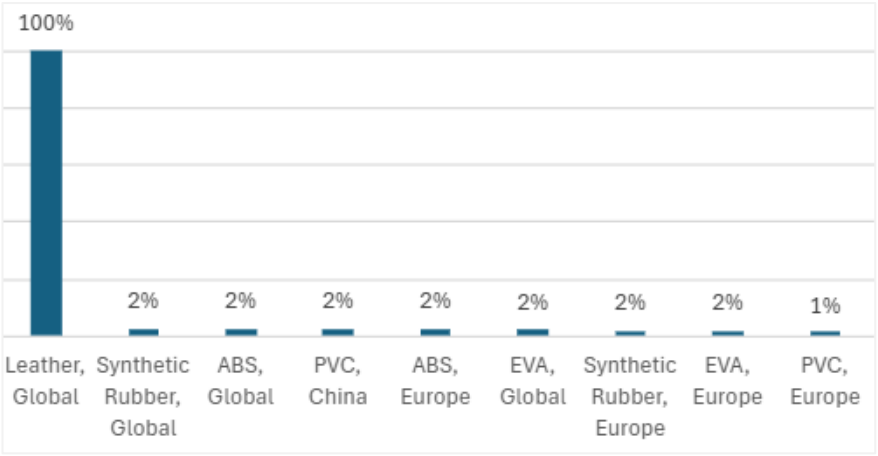

Figure 8 Presents the results for eutrophication terrestrial impact for the materials, expressed as percentages.

Leather shows the highest impact on terrestrial eutrophication, while EVA, Europe and PVC, Europe show the lowest.

The acidification results are presented in Figure 9.

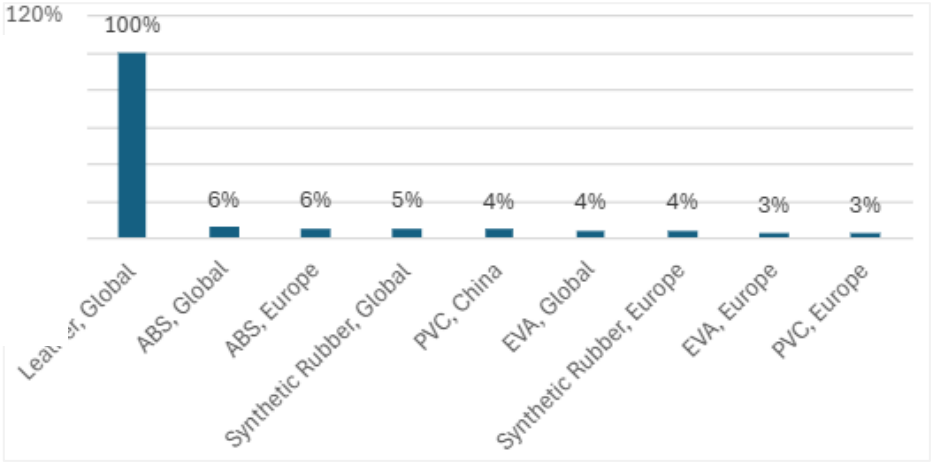

Figure 9 Presents the results for acidification impact for the materials, expressed as percentages.

Leather has the highest acidification impact. EVA, Europe and PVC, Europe show the lowest impact.

To sum up, leather's environmental impacts are significantly higher across all indicators, making it incomparable to plastics. Leather's high impacts are mainly driven by livestock-related methane emissions, contributing to climate impact. Ammonia, nitrogen and phosphorous releases further contribute to acidification and eutrophication.

The plastic materials show relatively similar impact levels, with only moderate variation. ABS has the highest climate impact among plastics, while synthetic rubber tends to be higher in the eutrophication categories. PVC and EVA generally show the lowest impacts across most indicators. The regional variation is minor but shows that Europe has slightly lower impacts overall. The difference between a European and a global dataset is most often shown in the data-sets for energy and chemicals, where most often the global datasets include a higher ratio of fossil resources.

The results don't include the production of shoes. As has been presented previously in the report, the top countries that Sweden is importing from are China, Vietnam and Indonesia. These countries use a lot of fossil fuels in their energy mix, which will have an impact on the production of shoes, since energy is an important factor in terms of climate change. However, the main impact in the manufacturing part comes from raw material extraction.

4.1.1 Research projects on circular design principles for footwear and need for future studies

Only one of the companies interviewed in this study had performed any type of LCA calculations. No shoe EPDs were found at EPD International's library. One LCA (cradle to grave) of professional footwear was found by Bodoga, A et al. (2024). It showed that the manufacturing of shoes, including material production, had the highest climate impact, about 80 percent of the life cycle. Thus, further investigation of the materials used in shoes is of great need.

Another shoe LCA was done by GORE-TEX in 2014, more specifically on a pair of hiking boots. The report is not available to the public anymore, but a YouTube video is available showing the results (GORE-TEX, 2011). The results, similar to the professional shoe LCA report, show that the manufacturing of the shoes has the highest impact with 77 percent of the total climate impact. This has also been shown by a master thesis report from 2015 (Gottfridsson, M., & Zhang, Y, 2015) showing that the manufacturing part of the shoes contributes to 80 percent of the total climate impact. They also showed that leather shoes have up to 50 percent higher climate impact compared to other shoes (here including waterproof, textile, rubber and plastic, and other shoes).

4.1.2 Recycled textile fibres

When it comes to recycled textile materials, it has not always been shown to be beneficial for the climate. Recycled textile materials, such as cotton and polyester, have been investigated quite a lot, and these show a small to no reduction (Nellström et al., 2025). This is explained by a low impact from the fibre production itself and a major impact of the garment production itself, due to high energy consumption. The only recycled material that showed a big reduction in climate impact in the Siptex report was wool, since wool has a higher environmental impact from its material production (Sandin et al., 2025 & Lidfeldt et al., 2022). However, other environmental impact categories (such as water use, impact on land use, etc.) can be reduced through the recycling of textile material (Nellström et al., 2025)..

4.2 Insights

In this study leather stands out with a larger impact in all selected categories but since the analysis does not include neither the production phase of the final product nor the user phase (the number of usage) which both are known to have large effects on a product's environmental impacts, **conclusions on material choice for a more sustainable product cannot be drawn.**

5. Identified requirements for eco-design relevant for the Swedish industry

The purpose of ESPR is to stimulate improved sustainability on products placed on the EU market. The design of products should be adapted for long use, repairability and recycling i.e. for the circular economy.

This study has analysed ESPR chapters I *General Provisions*, II *Eco-design Requirements* and III *Digital Product Passport* to understand the upcoming requirements relevant for the Swedish footwear industry. Chapter V *Prioritization, Planning and Consultation (including self-regulation measures)* and VI *Destruction of Unsold Consumer Products* have also been included in a more general analysis to identify potential areas of concern and interest for Swedish companies.

This section presents key implications of the potential rules under the ESPR for the Swedish footwear industry. The analysis highlights specific challenges linked to Nordic climate conditions, complex multi material designs, SME supply chains, and upcoming bans on destruction of unsold goods.

The specific challenges identified are presented below, without prioritization. A consolidated list of further questions is included at the end.

5.1 Performance, durability and material choices under Nordic use conditions

This section addresses how ESPR performance and material requirements interact with real-world use conditions in Nordic climates, where durability and functional performance are critical to achieving actual environmental benefits.

Performance requirements
Relevant ESPR reference: Article 5; Annex I (a, b, s, t).

Footwear used in Nordic climates is subject to harsher environmental conditions than in most other EU markets, with cold, wet and abrasive conditions contributing to rapid material degradation. If ESPR durability or material requirements are designed without accounting for these regional stressors, the result may be shoes that technically comply but perform poorly in practice. This could undermine the regulation’s intent: reducing lifecycle environmental impacts. For instance, a

lightweight shoe that passes EU durability tests under mild conditions might fail early when used in Nordic winter, increasing replacement frequency and total emissions. Nordic conditions can therefore function as a critical stress test for environmental performance and should inform minimum performance criteria.

Recycled requirements
Relevant ESPR reference: Article 5 Annex I (h, i).

ESPR can enable requirements related to recycled content in products, but for footwear the environmental performance of materials is closely linked to durability and performance in the use phase. Recycled polymer materials may, for example, be sensitive to environmental exposure, such as moisture and temperature variation, which can affect long-term performance. In addition, the availability of recycled content that meet high technical and durability requirements remains limited for certain applications.

Requirements that focus solely on input metrics, such as fixed minimum share of recycled content, may in some cases overlook material longevity and real-world performance. Where durability or functional performance is affected, shorter product lifetimes can reduce the overall environmental benefit. Circularity requirements under ESPR should therefore be applied with consideration of product durability, fitness for purpose and use conditions, recognising that requirements on recycled content can be appropriate in certain cases but are not necessarily the most relevant or effective lever in all contexts. This consideration is particularly important for products used in demanding climatic conditions, such as those common in Nordic markets.

5.2 Circularity requirements versus product integrity and safety

This section examines how circularity and chemical requirements may conflict with product integrity and safety in footwear, particularly where functional performance under Nordic conditions depends on complex material combinations and established technical solutions.

The limits of disassembly-based design
Relevant ESPR reference: Article 7; Annex I (b, c, d, e).

Footwear is one of the most complex product categories targeted by ESPR, often combining many tightly bonded materials in designs that prioritize waterproofing, durability, and safety. Requirements around disassembly, modularity, or mono-material use (if modelled too closely on textile logic) could be counterproductive for shoes.

Nordic examples such as winter boots, hiking footwear, or children's waterproof shoes highlight that certain circularity requirements might risk product safety or

reduce durability. Policymakers must recognize that trade-offs between disassembly and product integrity are real, and that footwear will require category-specific implementation pathways. The regulation should encourage environmental sustainability e.g. through circularity requirements without compromising core functionality.

Chemical and substitution requirements
Relevant ESPR reference: Article 7.2-7.5; Annex I (f).

Adhesives, coatings, and certain polymers play key roles in ensuring that shoes are waterproof, non-slip, and flexible even at sub-zero temperatures. ESPR's chemical restriction clauses must balance the drive to phase out harmful substances with the reality that substitutes might not yet meet functional needs. For example, a water-based adhesive may reduce toxicity but fail in wet, cold environments. Premature substitution can compromise safety (e.g. increased slip risk), durability, or comfort. Nordic footwear use may provide strong evidence of where substitutions work – and where they don't. Regulations should require substitutions only where technical viability and functional equivalence are proven.

5.3 Compliance feasibility: data, testing and administrative capacity

This section addresses whether ESPR requirements are practically implementable in an SME-dominated, import-dependent footwear sector, focusing on testing readiness, data availability and administrative capacity.

Missing test methods
Relevant ESPR reference: Article 5.12; Annex I (p, m)

There is a lack of standardized test methods for assessing performance, durability, and other quality aspects for footwear products. Method development must precede binding requirements otherwise; compliance barriers will arise regardless of product quality. Parallel to the development of different ESPR parameters methods for testing them should be developed, and interim solutions should be developed to allow compliance. If not, footwear should be allowed for transitional exemptions until standards exist.

DPP data requirements
Relevant ESPR reference: Articles 9-15; Annex III.

Footwear companies often rely on complex global supply chains with limited transparency or digital readiness (OECD, 2018). ESPR's DPP obligations, such as facility identifiers, component-level material data or chemical disclosures, may be difficult for small importers to fulfil, especially when suppliers are in non-EU

jurisdictions. These firms may face compliance barriers not due to unwillingness but due to a lack of leverage over their suppliers. For DPP to work, it must come with realistic timelines, data simplification options, and guidance tailored to SME:s for importing finished goods.

DPP requirements also risk reshaping sourcing strategies rather than improving product transparency. Importers may be pushed toward fewer, larger, and more "data-ready" suppliers, reducing flexibility and supplier diversity. This may reinforce market concentration, without necessarily improving environmental or social performance on product level.

For DPP to function as a transparency tool rather than a market filter, implementation must include realistic timelines, tiered data requirements, and clear guidance tailored to SMEs importing finished goods. Minimum datasets at the point of import, combined with gradual data deepening over time, would better reflect the structure of the footwear sector and its global supply chains.

Transition periods and administrative requirements
Relevant ESPR reference: Article 4; Article 8; Articles 13–15

Transition periods and administrative requirements must reflect an SME-dominated, import-dependent industry since most Swedish footwear companies are SMEs with limited in-house testing, engineering or data infrastructure. They depend on foreign suppliers with varying readiness for ESPR-compliant data, documentation, and verification.

For these actors, compliance feasibility depends less on technical capability and more on timing, clarity, and administrative proportionality. Short transition periods or complex documentation requirements risk creating de facto market barriers, particularly where compliance depends on supplier cooperation outside the EU.

5.4 Ban on destruction of unsold footwear creates both operational and design challenges

Relevant ESPR reference: Articles 23, 24, 25; Annex VII (prohibited destruction of specific consumer product groups); Commission Delegated Regulation setting out derogations from the prohibition of destruction of unsold consumer products.

The ESPR prohibition on destruction of unsold consumer products represents a structural shift in how unsold footwear must be managed. As footwear is covered by Annex VII, destruction will no longer be an acceptable default solution for products that remain unsold due to overproduction, over-importing, returns, or failed collections.

In line with Article 25(5) ESPR, a Delegated Regulation has been adopted specifying narrowly defined derogations. Destruction remains prohibited as a main rule but is permitted where specific conditions can be substantiated, including cases of dangerous products, legal non-compliance, intellectual property infringements or licence restrictions, technical infeasibility of preparing products for reuse, irreparable damage, design or manufacturing defects, failed donation attempts, or lack of recipients after preparation for reuse.

This act does not create a free disposal option. Rather, it transforms destruction into a regulated and evidence-based exception. Where a derogation applies, the product effectively becomes waste. Treatment must then follow the waste hierarchy under Article 4 of the Waste Framework Directive. This means that even when destruction is legally justified, economic operators cannot default to incineration if material recycling is feasible. Destruction is therefore an act within waste law, not outside it.

Operationally, affected actors – primarily large enterprises, as micro and small enterprises are exempt and medium-sized enterprises will only be subject to the prohibition from 2030 - will need to develop alternative pathways for unsold products, including resale, refurbishment, donation, or recycling routes. For Swedish companies operating as importers, wholesalers, and Nordic distribution hubs, this is particularly challenging due to for example cross-border warehousing, and re-export flows.

Article 24 introduces additional administrative requirements through mandatory disclosure of volumes of unsold footwear, reasons for non-sale, and the treatment routes applied. While these requirements primarily affect companies within the scope of the prohibition, they create new data and reporting obligations that are particularly demanding for companies managing many distinct product variants and seasonal collections.

5.5 Questions for further investigation

There are still many uncertainties for Swedish footwear companies regarding the upcoming potential regulations through the ESPR. Some of them should be further investigated to gain a better understanding of the impacts and challenges for the companies. Some questions are clustered in themes in table 11.

Table 11 Themes and questions for further investigation

Theme	Question
Testing methods	What climate-specific performance tests are missing? How should durability classes be adapted for Nordic conditions? Which failure modes occur specifically under winter use? How can climate-corrected LCA assumptions be developed? Which ESPR parameters lack test standards? How long will standards development take?

	What interim solutions could allow compliance? Should footwear be allowed transitional exemptions until standards exist?
Modular design	What disassembly steps are technically possible without compromising safety or waterproofing? Which parts of footwear can realistically be made modular? What recycling pathways exist today for multimaterial products? What data do recyclers actually need?
Performance and sustainability requirements	What minimum performance criteria must recycled materials meet in Nordic climates? What supply constraints limit access to high-performance recycled polymers? How can rebound effects (shorter lifetime → more waste) be quantified?

Other questions that should be considered are connected to the implementation phase of the ESPR:

- What transition time is technically realistic?
- How can administrative burden be quantified for SMEs?
- What minimum documentation should be required at the point of import?
- What support tools would SMEs need for DPP?

This study did not investigate the current state of volumes and type of footwear that are unsold and destroyed. Future studies should address this issue and explore ways to minimize overproduction and develop business models for resource efficient production and sale of footwear on the Swedish market.

5.6 Insights

Most Swedish actors are micro or small enterprises, primarily active in retail, distribution, repair, and import rather than manufacturing. ESPR applies to the economic operator placing the product on the EU market. For imported footwear, responsibility therefore lies primarily with Swedish importers and brand owners, even when they lack control over design and production. In practice, ESPR will be implemented by actors with limited control over upstream choices, but with full regulatory liability at market entry.

This creates a situation where compliance may become less a question of product innovation and more a question of contractual power, supplier leverage, and access to credible documentation. For SMEs, a competitive position may increasingly depend on their ability to secure compliant suppliers rather than on brand, price, or design alone. Larger actors with in-house compliance capacity, stronger supplier relationships, and greater tolerance for regulatory risk are better positioned to

absorb ESPR requirements. Smaller importers may exit certain product categories or the market entirely, reducing diversity and potentially increasing prices without clear environmental gains.

The absence of standardized test methods is the most fundamental practical barrier. Without agreed methods for durability and performance, compliance becomes uncertain, increasing both cost and legal risk. This uncertainty may discourage product diversification, limit supplier switching, and reduce willingness to trial new materials or designs, counteracting ESPR's innovative objectives. Method development must therefore precede or run in parallel with binding requirements, supported by transitional exemptions.

Conclusions and recommendations

This study has tried to reflect the general conditions for ecodesign for Swedish footwear companies and products. The main conclusions are developed below.

5.7 Swedish companies and ESPR

Sweden is a net importer of shoes and parts for shoes, importing more than twice as much (both in thousand SEK and tons) than we export. The way the import and export statistics is compiled, and the level of granularity presents a lack of information from an ESPR regulation perspective. The categories mainly describe general shoe types, such as whether a shoe has uppers covering the ankle, but they do not provide information on materials, chemical content, or product construction, which are central for ecodesign and traceability requirements. To improve transparency and support future regulations, trade statistics would benefit from another categorization that reflects sustainability aspects.

The Swedish footwear market today is somewhat fragmented, consisting of many smaller companies alongside a few larger ones. The market is largely dominated by outsourced production in other European and non-European countries. Thereof, extensive expertise in shoe construction and production capacity are probably higher in these countries compared to Sweden.

Among the interviewed companies, approaches to ecodesign, traceability, and life cycle perspectives vary, but are not strictly dependent on company size. Some smaller companies have made notable progress in resource efficiency and circularity, while others have yet to begin fully mapping their supply chains, supplier tiers, and the traceability of materials and chemicals used in production. For several companies, markings of materials and components for traceability remain limited to regulation requirements. Differences in DPP preparedness are also significant, an area which is closely tied to traceability and information flow in the supply chain. Some companies are in the process of implementation, while others have not yet started. Regardless of company size, a precautionary approach is essential when introducing ESPR for footwear, to avoid undermining companies' ability to meet future requirements.

Looking ahead, Sweden should take a positive view of ESPR but place primary emphasis on strengthening requirements for traceability and transparency across supply chains. It is important that requirements are applied across the entire industry to avoid creating uneven competition, but it is also crucial that this is done step by step to not undermine companies that have not yet committed to this work. One example of a measure to increase traceability and transparency would be to first build documentation, systems and processes covering the main material components of shoes such as upper, lining, insole and outsole, then gradually

include requirements for environmental impact and durability/longevity requirements, continue with integration and updating of systems, and finally increase the level of detail step by step. In this context, the development of DPP goes hand in hand with these efforts.

Because shoes consist of a wide variety of materials, trade-offs often arise between modular design and durability. ESPR should therefore prioritize the development of footwear with increased longevity and durability as a first step. Glued construction methods are necessary to meet technical requirements, particularly in outdoor and sports segments, and standardized quality requirements for durability are essential to ensure that footwear achieves its intended lifespan. As a second step, design for the R-strategies of reuse, repair, and refurbishing, should take precedence over recycling. Thirdly, efforts should be directed toward reducing the number of different materials used in a shoe, striving for increased mono-material constructions without impacting functionality, durability or consumer requirements. Finally, the recycling capacity for footwear must be stimulated to increase the share of recycled material. However, since recycling potential depends on material combinations and construction methods, this work will need to be developed gradually.

5.8 Environmental impact and ESPR

Based on the work in this study, assessing the environmental impact of footwear, for example in CO_2 equivalents per pair of shoes, is still relatively uncommon in the Swedish footwear industry and there is also a lack of available environmental data. Future studies should focus more on the environmental impact of materials in shoes, lifetime of different materials and lifetime of shoes, since “one pair of shoes” may not be a meaningful functional unit without longevity aspect. More LCA: s of different types of shoes are also needed, as well studies that investigate the water impact.

The environmental impact of materials, except for leather, were taken from Ecoinvent. Further investigation into the environmental impact of footwear materials would therefore be of interest, to also enable a comparison. The environmental results in this report were presented per kg material, not specific for shoe production.

Further investigation needs to be done on specific shoe material production and their environmental performance. The results presented in this report were not considering the lifetime of materials, an important parameter for evaluating the actual life cycle impact of different materials. If a material lasts and are used twice as long compared to another material, that material will obviously reduce the environmental impact by half. This applies to any shoe: if its lifetime is doubled, its environmental impact is cut in half, as long as the prolonged lifetime replaces the need of buying a new pair of shoes. The same logic would also apply if the weight of the shoe materials were cut in half, with a maintained lifetime.

Therefore, considering the lifetime of the materials would be a crucial next step. LCA: s of different types of shoes is also well needed. Different shoes have different functions, properties, lifetimes, materials, and origin of production which are all factors that greatly affect the outcome of an LCA study.

A further investigation of regionalized water deprivation, through Available Water Remaining (AWARE) (Wulca, n.d) would be of interest since, for example leather consumes a lot of water.

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Appendix – 1

Examples of questions asked during the interviews

Materials use and construction

1. Which materials do you use, and which do you avoid in your shoes, and why? Examples of material groups: rubber, plastics, leather, synthetic leather, textiles and metals.
2. How do you work to evaluate and select new materials in footwear? For example, based on sustainability, climate impact, circularity, cost or availability.
3. How do different materials, including bio-based and lightweight materials, perform in Swedish climate conditions (moisture, cold, salt)?
4. Are there materials or chemicals that are particularly suitable for Swedish conditions and that distinguish the Swedish market?
5. How common are bonded constructions compared to modular shoe constructions in your products, and what advantages and disadvantages do you see?
6. Which material and/or construction types do you believe will become more dominant in your product range going forward?

Ecodesign

1. How do you work with ecodesign today, and what knowledge do you have about the upcoming ESPR regulation?
2. Which parts of ecodesign and the new requirements do you perceive as most positive versus most challenging?
3. How may increase requirements for reparability and recyclability affect your material choices and constructions for footwear?
4. Which European examples of upgrading or remanufacturing of shoes are you aware of, and which models appear technically feasible to apply?
5. How would you describe the current recycling capacity for footwear in the Nordic countries, and which material combinations create the greatest barriers?
6. Which methods are used to evaluate durability/performance and lifespan during development of footwear today?

Traceability and life cycle perspective

1. How do you currently work with traceability of materials and products?
2. What information about materials and products is available, and at what level of detail?
3. What does the dialogue with your suppliers look like regarding increased traceability and environmental performance?
4. How do you view the upcoming traceability requirements, and which aspects are perceived as most challenging or most positive?
5. How do you work with life cycle assessments (LCA) or other environmental assessments, and where do your largest data gaps occur?
6. Which LCA tools do you use (if any)?
7. Which environmental labels do you use (for materials and for shoes, respectively), and how do they influence your development and communication work?

Digital Product Passports

1. How far have you come in your work with digital product passports (planning, pilot or implementation)?
2. Which parts of DPP do you see as most challenging (e.g. labelling, system management, data collection)?
3. How do DPPs fit into your broader environmental and sustainability work, including LCA and environmental labelling?

Appendix – 2

Market analysis – Import/ Export tables

Imports and exports of goods, adjusted for non-response, by CN product group and year.
Varuimport och varuexport bortfallsjusterat, efter varugrupp enligt KN och år

	Import, kSEK CN 64	Export, kSEK CN 64		Import, ton CN 64	Export, ton CN 64
2000	3 997 535	644 589	**2000**	22 891	3 478
2001	4 141 066	758 791	**2001**	21 249	3 667
2002	4 370 576	909 713	**2002**	22 750	4 398
2003	4 086 154	1 030 880	**2003**	23 501	4 436
2004	4 293 698	1 072 454	**2004**	24 454	4 568
2005	4 550 244	1 172 124	**2005**	26 736	4 791
2006	5 286 307	1 607 173	**2006**	28 420	6 127
2007	5 608 023	1 560 052	**2007**	31 503	6 320
2008	5 525 208	1 580 387	**2008**	28 185	6 304
2009	5 513 167	1 611 699	**2009**	24 678	5 353
2010	6 186 087	1 664 446	**2010**	28 302	5 076
2011	6 820 511	1 920 700	**2011**	31 123	5 753
2012	6 729 768	2 033 919	**2012**	27 940	5 986
2013	6 775 925	2 064 925	**2013**	26 775	6 229
2014	6 699 487	2 114 241	**2014**	27 756	6 256
2015	8 642 614	2 654 849	**2015**	32 750	7 429
2016	9 751 871	2 907 202	**2016**	32 813	7 282
2017	9 912 601	3 230 942	**2017**	32 520	7 776
2018	11 007 790	3 690 273	**2018**	33 547	8 581
2019	12 742 709	5 247 816	**2019**	37 340	11 498
2020	11 936 753	5 823 063	**2020**	35 101	12 940
2021	12 046 446	5 754 119	**2021**	36 636	12 083
2022	15 288 048	6 600 028	**2022**	41 384	12 857
2023	13 685 342	6 576 312	**2023**	31 741	11 719
2024	13 657 037	6 001 087	**2024**	32 723	10 613

Imports of goods, adjusted for non-response, by CN product group and year.

Varuimport, bortfallsjusterat, ton efter varugrupp enligt KN och år

	CN 6401 Waterproof shoes & boots (import, ton)	CN 6402 Other rubber & plastic shoes (import, ton)	CN 6403 Leather shoes (import, ton)	CN 6404 Textile shoes (import, ton)	CN 6405 Other footwear (import, ton)	CN 6406 Parts for footwear (import, ton)
2000	2 519	6 351	9 620	2 579	684	1 137
2001	2 520	6 333	8 681	2 013	548	1 154
2002	2 454	7 213	9 400	2 043	447	1 193
2003	2 087	7 414	9 510	2 787	641	1 061
2004	2 325	7 350	9 294	3 752	671	1 061
2005	2 787	7 540	10 506	4 158	632	1 113
2006	2 465	8 547	10 137	5 519	579	1 173
2007	2 851	11 177	9 715	5 770	638	1 353
2008	2 649	8 928	9 491	5 169	718	1 230
2009	2 130	8 020	7 467	4 904	835	1 322
2010	3 000	9 009	7 866	5 925	1 030	1 471
2011	3 161	9 302	8 723	7 109	1 181	1 646
2012	2 620	7 753	8 608	6 665	1 061	1 231
2013	2 710	6 672	8 132	7 103	854	1 304
2014	2 750	7 169	8 558	7 606	626	1 047
2015	3 009	8 122	10 638	9 067	829	1 087
2016	2 722	7 841	10 555	9 532	776	1 386
2017	2 296	7 820	10 349	10 092	818	1 145
2018	2 580	7 445	10 218	10 892	918	1 494
2019	2 443	8 447	12 118	11 949	994	1 390
2020	2 637	7 560	10 781	12 387	765	973
2021	3 730	8 730	10 787	11 527	673	1 189
2022	4 072	10 741	10 938	13 298	966	1 370
2023	1 814	8 715	9 369	10 137	650	1 056
2024	2 147	9 257	9 705	9 872	798	943

Export of goods, adjusted for non-response, by CN product group and year.

Varuexport, bortfallsjusterat, ton efter varugrupp enligt KN och år

	6401 Waterproof shoes & boots (export, ton)	6402 Other rubber & plastic shoes (export, ton)	6403 Leather shoes (export, ton)	6404 Textile shoes (export, ton)	6405 Other footwear (export, ton)	6406 Parts for footwear (export, ton)
2000	305	627	1 609	324	303	311
2001	308	708	1 775	247	327	303
2002	409	880	2 148	454	149	358
2003	364	982	2 190	403	190	307
2004	365	1 059	2 181	439	161	363
2005	619	868	2 026	795	189	295
2006	659	1 174	2 790	1 006	207	291
2007	708	1 128	2 823	1 039	176	447
2008	752	953	2 937	1 052	214	398
2009	542	645	2 646	914	187	420
2010	391	733	2 359	855	328	411
2011	389	794	2 636	937	548	449
2012	382	747	2 849	1 029	609	371
2013	626	880	2 390	1 584	407	341
2014	610	980	2 537	1 695	172	262
2015	579	1 329	2 891	2 152	174	304
2016	568	1 097	3 138	2 031	133	315
2017	601	1 159	3 335	2 181	182	319
2018	629	1 209	3 441	2 651	286	364
2019	546	2 094	4 543	3 372	655	289
2020	794	2 196	5 063	3 976	618	293
2021	962	2 177	4 727	3 455	488	275
2022	961	2 612	4 902	3 688	431	263
2023	578	2 620	4 487	3 286	533	214
2024	583	2 674	3 979	2 789	337	252

Imports of goods, adjusted for non-response, thousand SEK, by CN product group and year.
Varuimport, bortfallsjusterat, tkr efter varugrupp enligt KN och år

	6401 Waterproof shoes & boots (import, kSEK)	6402 Other rubber & plastic shoes (import, kSEK)	6403 Leather shoes (import, kSEK)	6404 Textile shoes (import, kSEK)	6405 Other foot wear (import, kSEK)	6406 Parts for footwear (import, kSEK)
2000	129 651	694 674	2 585 504	370 661	88 671	128 373
2001	129 773	771 279	2 656 599	352 816	82 108	148 490
2002	142 148	852 675	2 796 953	350 141	77 679	150 982
2003	129 379	761 833	2 593 766	378 360	96 924	125 892
2004	136 719	784 336	2 600 723	541 239	94 175	136 507
2005	159 581	794 516	2 735 145	622 635	89 124	149 243
2006	157 290	981 062	3 057 780	846 546	90 755	152 873
2007	185 462	1 194 044	3 050 194	893 571	102 230	182 521
2008	201 096	989 734	3 125 486	901 653	116 700	190 539
2009	181 767	1 105 976	2 865 488	998 653	168 715	192 568
2010	217 792	1 237 189	3 080 048	1 197 814	214 739	238 504
2011	230 832	1 277 184	3 378 899	1 389 125	285 253	259 218
2012	199 546	1 282 451	3 280 067	1 528 609	243 917	195 178
2013	208 520	1 137 184	3 302 242	1 716 090	201 455	210 433
2014	208 119	1 186 671	3 163 165	1 776 536	167 590	197 406
2015	298 069	1 495 642	4 035 503	2 364 246	211 432	237 721
2016	257 911	1 549 612	4 515 376	2 953 617	214 593	260 761
2017	252 863	1 508 424	4 311 460	3 386 923	218 833	234 098
2018	304 735	1 623 001	4 606 002	3 912 886	244 604	316 563
2019	298 098	2 031 937	5 367 216	4 474 237	269 872	301 348
2020	289 772	1 868 859	4 775 147	4 568 385	228 361	206 228
2021	408 864	2 101 049	4 525 405	4 523 673	217 482	269 973
2022	525 139	3 084 181	5 572 863	5 440 749	336 038	329 078
2023	260 518	2 728 131	5 553 732	4 618 377	232 252	292 332
2024	296 575	2 776 444	5 600 529	4 447 421	259 446	276 622

Exports of goods, adjusted for non-response, thousand SEK, by CN product group and year.
Varuexport, bortfallsjusterat, tkr efter varugrupp enligt KN och år

	6401 Waterproof shoes & boots (export, kSEK)	6402 Other rubber & plastic shoes (export, kSEK)	6403 Leather shoes (export, kSEK)	6404 Textile shoes (export, kSEK)	6405 Other footwear (export, kSEK)	6406 Parts for footwear (export, kSEK)
2000	44 417	86 390	401 263	56 972	30 147	25 400
2001	46 679	114 866	473 205	52 079	40 286	31 676
2002	55 099	157 097	550 221	78 243	35 220	33 833
2003	53 247	203 047	597 670	103 074	42 090	31 753
2004	57 765	207 035	621 256	111 794	37 174	37 430
2005	66 333	213 547	659 137	153 424	43 760	35 923
2006	81 706	342 734	876 826	222 447	50 453	33 007
2007	112 106	248 108	835 128	263 665	49 721	51 323
2008	104 822	217 948	896 119	243 582	71 411	46 504
2009	98 710	195 567	901 511	266 826	99 044	50 042
2010	114 970	223 962	855 438	253 513	151 746	64 817
2011	125 094	220 613	1 008 495	282 209	213 468	70 820
2012	109 067	214 709	1 109 111	328 663	211 179	61 190
2013	119 147	216 679	1 053 182	462 786	146 835	66 297
2014	105 623	269 630	1 040 880	535 722	101 126	61 260
2015	111 934	379 144	1 255 826	729 577	103 913	74 454
2016	96 582	329 754	1 496 941	809 051	92 915	81 959
2017	110 615	339 980	1 651 804	928 344	115 585	84 615
2018	127 529	399 800	1 816 987	1 081 042	151 805	113 110
2019	136 481	770 141	2 546 425	1 508 614	197 105	89 050
2020	194 854	736 229	2 724 607	1 855 883	220 565	9 0925
2021	236 463	761 457	2 680 267	1 792 161	182 703	101 068
2022	253 229	960 204	3 178 554	1 879 597	214 398	114 046
2023	187 690	1 056 379	3 148 202	1 860 125	212 493	111 423
2024	155 506	1 063 758	2 794 967	1 629 651	232 734	124 472

Imports of goods by country of dispatch. Not adjusted for non-response; tonnes by CN product group, partner country and year
CN 64. (Less than 1% are omitted)
Varuimport från samtliga länder efter varugrupp KN 2,4,6,8-nivå och handelspartner, sekretessrensad, ej bortfallsjusterat. Månad 1995M01 - 2025M09

	2020	2021	2022	2023	2024	2024 %
China	8 980	10 677	13 337	8 702	10 211	**33%**
Germany	5 009	4 409	4 877	4 373	4 240	**14%**
Poland	2 445	2 115	2 467	2 282	2 379	**8%**
Viet Nam	2 465	2 589	2 969	1 870	1 898	**6%**
Netherlands	1 994	1 903	1 795	1 589	1 731	**6%**
Denmark	2 340	1 924	1 893	1 660	1 636	**5%**
Norway	746	951	1 198	1 135	1 279	**4%**
Belgium	1 688	1 523	1 661	1 400	1 123	**4%**
Italy	421	628	808	753	859	**3%**
Finland	1 350	1 290	1 181	996	818	**3%**
Indonesia	340	415	683	494	569	**2%**
United Kingdom (Great Britain and Northern Ireland)	732	425	380	374	361	**1%**
India	291	332	345	259	353	**1%**
Spain	257	294	331	409	338	**1%**
Hong Kong	336	403	855	293	284	**1%**
Macao	1	0	1	113	267	**1%**
Austria	263	270	363	276	247	**1%**
France	540	454	399	271	238	**1%**
Bangladesh	72	64	167	182	198	**1%**
Sri Lanka	1	0	20	116	195	**1%**
Myanmar	180	207	525	246	187	**1%**
Türkiye	168	260	277	77	178	**1%**
Portugal	876	373	942	464	155	**1%**

Export of goods by country of dispatch. Not adjusted for non-response; tonnes by CN product group, partner country and year CN 64. (Less than 1% are omitted) *Varuexport till bestämmelseland. Ej bortfallsjusterat, ton efter varugrupp enligt KN, handelspartner och år. KN 64*						
	2020	**2021**	**2022**	**2023**	**2024**	**2024%**
Norway	2554	2666	2851	2786	2702	**26%**
Finland	2929	2630	2462	2163	2177	**21%**
Poland	1112	1052	1259	1530	1507	**15%**
Denmark	1285	1031	1003	943	970	**9%**
Germany	2221	1703	1790	1251	866	**8%**
China	25	23	28	35	309	**3%**
Netherlands	222	266	309	296	290	**3%**
United Kingdom (Great Britain and Northern Ireland)	462	529	625	426	212	**2%**
France	211	210	237	234	200	**2%**
Czechia	98	153	165	139	141	**1%**
Belgium	95	123	128	104	124	**1%**
United States (USA)	137	205	228	143	95	**1%**
Italy	79	83	104	170	68	**1%**
Switzerland	94	105	73	79	67	**1%**
Spain	67	73	59	68	67	**1%**