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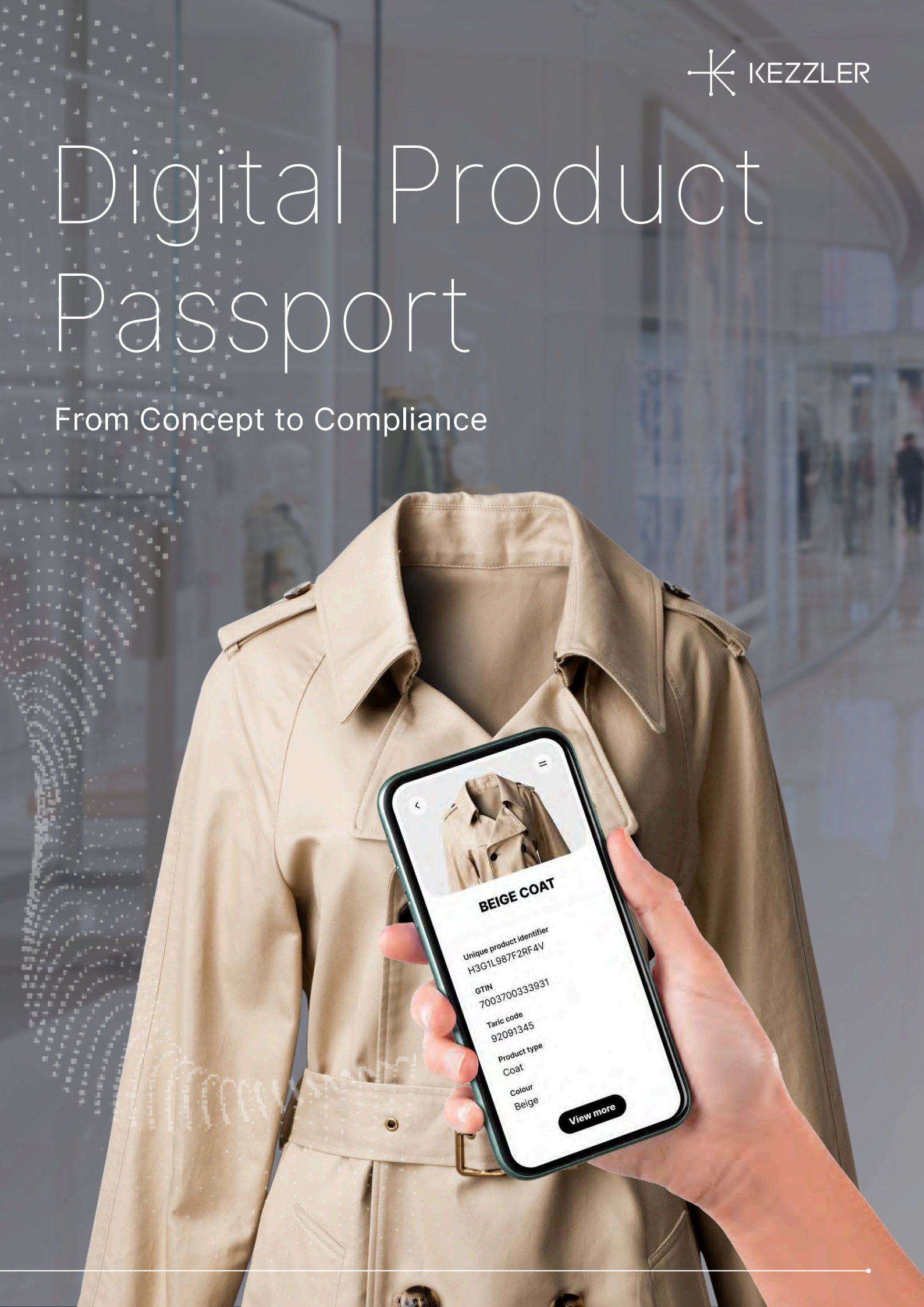
# Digital Product Passport

## From Concept to Compliance



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# Introduction: The DPP journey has started

We are taking the first steps towards sustainable product management. As the EU leads the charge toward a climate-neutral continent by 2050, the **Digital Product Passport (DPP)** is set to revolutionise how we track and manage the lifecycle of products. Together, we are imagining a world where every product tells its own story – where it came from, what it's made of, and how it can be reused or recycled. What was a vision in 2020 is now becoming a reality under the ambitious framework of the European Green Deal.

**The European Green Deal** is a transformative initiative aiming to make Europe the first climate-neutral continent. Achieving the European Green Deal's targets requires a radical shift in how we produce, consume, and recycle goods. **The Ecodesign for Sustainable Products Regulation (ESPR)**, adopted in 2024, is the legislative backbone supporting this transition. It mandates comprehensive sustainability criteria for products sold within the EU. From durability and energy efficiency to the inclusion of recycled content and reparability, these requirements ensure that sustainable products become the norm.

At the heart of this transformation lies the DPP – a digital gateway from the physical product to a wealth of information and advice about maximizing the lifecycle of a garment. The DPP is a significant leap forward in best practice circularity and transparency and is more than just a regulatory requirement; it's a game-changer for businesses and consumers alike. It offers brands an opportunity to enhance product value, build consumer trust, and gain a competitive edge in a sustainability-focused market. For consumers, it provides access to transparent, reliable information, empowering them to make more informed and eco-conscious purchasing decisions. For everyone, it maximizes opportunities for new services like automated resale, localized repair, rental, take-back, and much more.

Kezzler has been at the heart of the DPP development from day one, participating in key regulatory bodies defining the regulations and implementation standards to pilot deliveries as part of **CIRPASS-2**.

In this comprehensive *From Concept to Compliance* guide, we will share everything we have learned. We will explore the regulatory landscape, define what the DPP is, delve into the technical and data aspects of the DPP architecture, and look at the new commercial opportunities the regulations bring. You will discover why the DPP is a critical success factor for achieving a circular economy, how it enhances product reliability, and what steps companies must take now to prepare for this new era.

## Feeling ready? Good! Let's embark on this journey towards a more sustainable and transparent future, starting with the regulatory context of the DPP.

# DPP in a regulatory context

The European Green Deal serves as the umbrella for all sustainability efforts within the EU. It is an ambitious plan aimed at **making Europe the first climate-neutral continent by 2050**. The plan sets an intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels (**The European Climate Law, June 2021**). To achieve these goals, all EU policies and all sectors of the economy and society must play their part.

To bring the EU Green Deal proposals to life, more sustainable products must become the rule rather than the exception. The Ecodesign for Sustainable Products Regulation (ESPR) entered into force on July 18th, 2024. The ESPR is a framework legislation impacting a wide variety of products, outlining a set of sustainability requirements that products must meet to be sold within the EU market. The requirements include:

- Product durability, reusability, upgradability, and reparability
- Presence of substances that inhibit circularity
- Energy and resource efficiency
- Recycled content
- Remanufacturing and recycling
- Carbon and environmental footprints
- Information requirements, including a Digital Product Passport

The Digital Product Passport (DPP) was first mentioned in the EU's Circular Economy Action Plan (**CEAP, March 2020**). While DPPs are not a regulation in themselves, they are a requirement within the ESPR and are viewed as an important enabler towards a circular economy. **Responsible Economic Operators (REOs)** within most industries launching products on the European market will need to implement DPPs to comply with these new regulations.

By understanding the DPP's role within the ESPR and the broader goals of the European Green Deal, companies can better prepare to meet these new standards and leverage the opportunities they bring.

*Photo credit: Trimco Group*

# Why DPP

The implementation of DPP offers numerous advantages to various stakeholders within the EU market. These benefits are critical in advancing the sustainability agenda and supporting the circular economy. Some of the key reasons as to why broad implementation of DPP is essential include:

### Enabling public authorities and policy makers to incentivize more sustainable products

Mechanisms are expected to encourage more sustainable product development across all categories. For example, products with lower sustainability scores might be taxed higher. However, this is complex; there are multiple parameters with varying importance levels to be considered, such as durability versus recycled content in garments.

### Promoting circular business models

DPP is considered a key tool for the circular economy, and it certainly looks promising. A key aspect of DPP is the information requirements, which drive product development towards more circular and sustainable practices. Equally interesting is the way DPP can help streamline use cases like resale and repair. Integrating the DPP solution into such services will remove some of the usage barriers and potentially provide brand owners with new insights into their products, thus enabling them to create even better products.

### Providing market surveillance and customs authorities easy access to information needed to carry out their tasks

DPP provides easy access to relevant product and production data for authorities, making surveillance and customs operations much more efficient. This benefits all well-intentioned parties and contributes to a more level playing field.

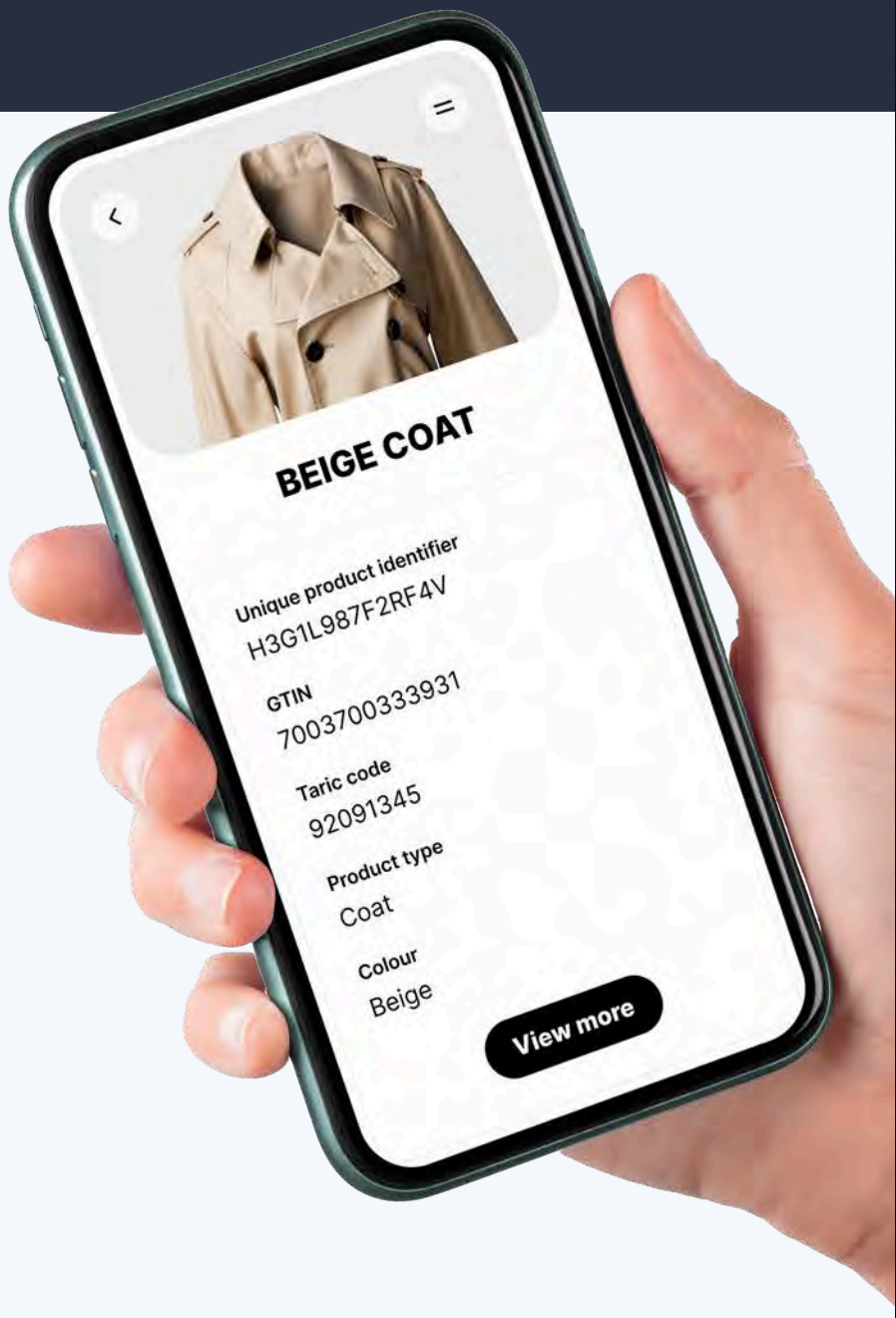
### Equipping consumers with tools for more conscious purchase decisions

DPP can help consumers make more informed choices. While currently this may be more theoretical for certain categories, the goal is to encourage consumers to consider **Environmental, Social, and Governance (ESG)** metrics when making choices. Ideally, with all else being equal, consumers will opt for the greener alternative.

# DPP defined

As defined by the **CIRPASS project**, DPP is ‘a structured collection of product-related, machine-readable data with predefined scope and agreed data management and access rights conveyed through a unique product identifier and that is accessible via electronic means through a data carrier’.

This definition highlights two key components of DPP: the system side and the data side, each of which is explained on the following pages.




01 UNIQUE PRODUCT IDENTIFIER

02 GTIN

03 TARIC CODES

04 COMPLIANCE DOCS

05 SUBSTANCES OF CONCERN

06 USER MANUALS

07 MANUFACTURER

08 OPERATOR IDENTIFIERS

09 FACTORY IDENTIFIERS

10 IMPORTER

11 ECOLABEL

12 PERFORMANCE

13 CONSUMER INFORMATION

14 TREATMENT FACILITIES

15 OTHER INFORMATION

# The DPP system

The DPP system focuses on the technical implementation, including all standards and protocols related to the IT architecture. Here, the main concern is to create a system that is interoperable and works securely for all sectors, with different layers of access rights.

The standards of the DPP system are the work of the EU's standardisation organisation, **CEN/CENELEC**. This three-year long task is expected to be finalised at the end of 2025. The DPP system will address areas such as data security, authentication, reliability, access rights, carriers, and unique identifiers.

From the **ESPR document**, it's possible to draw a high-level map on what the system will look like (see Figure 01 below). One of the main purposes of ESPR and DPP is to enable circular use cases, as illustrated in the right part of the figure with the **10 R's of circularity (modelled by Prof. Dr. Jacqueline Cramer).** Companies with a clear circularity strategy will be able to take advantage of DPP to support various circular use cases. However, this currently is considered an optional part of DPP, whereas the top part illustrates the mandatory DPP system.

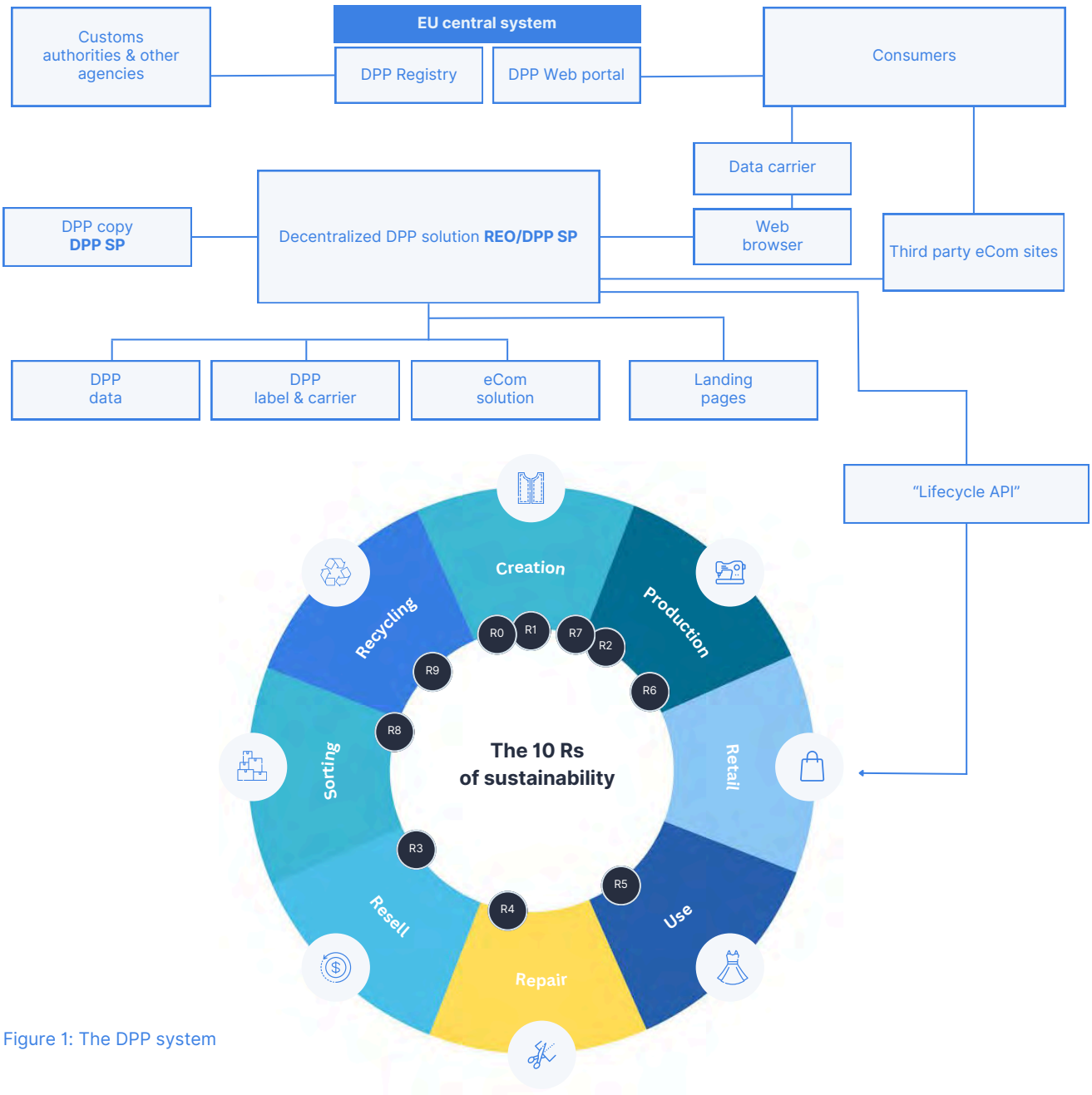



Figure 1: The DPP system

# A decentralised system with a central EU component

To foster innovation and creativity, and to prevent a 'winner takes all' scenario, it has been decided that DPPs should be issued within a decentralised system. Responsible Economic Operators (REOs) have the option to either develop their own DPP solution or collaborate with a DPP service provider. There are two important aspects to note here:

01 If an REO builds its own DPP solution, they still need to work with a DPP service provider to secure a backup copy of the DPP, in case operations cease.

02 A DPP service provider will need to be certified. Since the criteria are not yet known, it's uncertain who these providers will be. This will likely become clear at the beginning of 2026.

Mandatory DPP data will mostly be related to upstream data, which needs to be available for the DPP solution, along with any other data that the DPP can carry, such as enhancing the customer experience related to care and repair, resale, etc. The solution also needs to integrate with label providers capable of producing labels with the required DPP carrier, such as QR or NFC, at the required level of granularity.

Consumers and other stakeholders must have free and easy access to landing pages presenting the relevant DPP information, with different access rights depending on their needs. The same applies to online shoppers, including those on remote online marketplaces. Here we will likely see a slightly different requirement regarding the granularity of DPP. If the granularity level of DPP is batch level or item level, it is very unlikely the same will apply to online stores – this would place an extreme burden on warehouse operations. Keeping the online store updated with exactly which batch or item is currently being picked is virtually impossible and would be extremely costly. For this reason, the granularity for ecommerce sites is likely to be at the model level (granularity levels are further discussed below).

The central EU component, to be administered by the EU, will consist of two parts: a DPP registry and a DPP web portal. **The DPP registry** is expected to be operational within two years after the ESPR entry into force, i.e. June 2026. The registry will serve at least two purposes:

01 Allow the REO to register new DPPs and receive a DPP registration ID in return.

02 Enable customs authorities to verify that all imported products placed on the EU market come with a valid DPP, and that the TARIC code corresponds with the actual shipment. Note that this is not the same as a compliance verification.

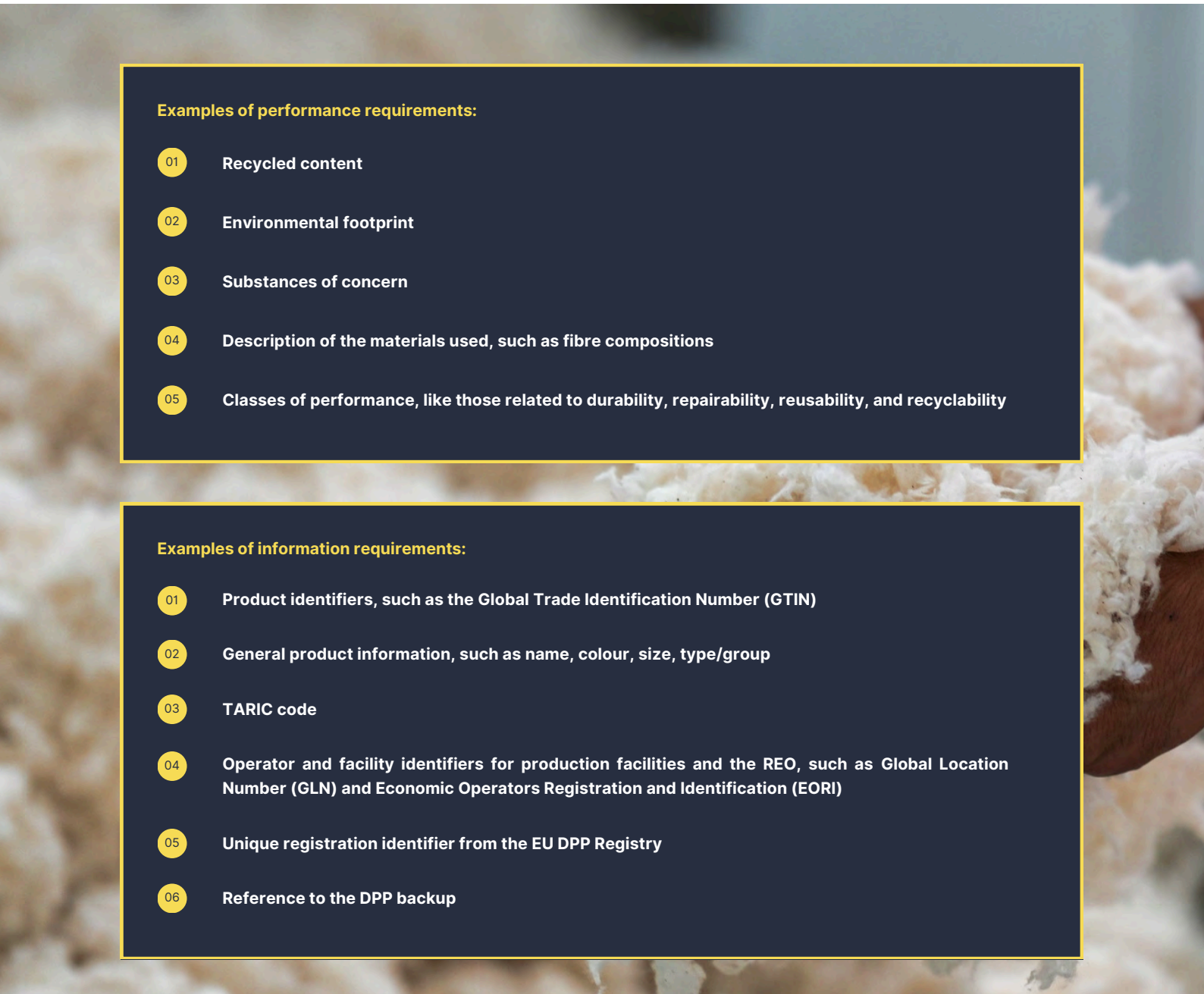
**The DPP web portal** will be established for consumers and other stakeholders to search for and compare products. As of now, little is known as to how this will work, but we can imagine a system similar to current online shopping experiences. For example, a consumer considering buying a specific pair of jeans might want to compare them to a similar model and choose the pair that scores best according to their standards. This raises questions about whether both model IDs or QR codes will be needed, or perhaps AI will suggest comparable items based on the selection they're already considering.

# DPP data

Currently, DPP data is a major focus for most brands and REOs, as achieving full visibility in many global, complex supply chains requires significant effort. Although the final details of the data requirements will not be known until each sector-specific delegated act is published, some elements are already clear from the ESPR document.

Ecodesign requirements are divided into information requirements and performance requirements. One or both types might be included in the DPP, depending on the sector and product type. The purpose is to motivate consumers to make more sustainable purchase decisions and ensure that the best products are launched over time.

Performance requirements are standards set to ensure that products meet required levels on given parameters, such as durability, reliability, safety standards, efficiency, and environmental impact. Information requirements are related to obligations brands have to provide specific information about the products and production to ensure transparency to all stakeholders.



**Examples of performance requirements:**

01 **Recycled content**

02 **Environmental footprint**

03 **Substances of concern**

04 **Description of the materials used, such as fibre compositions**

05 **Classes of performance, like those related to durability, repairability, reusability, and recyclability**

**Examples of information requirements:**

01 **Product identifiers, such as the Global Trade Identification Number (GTIN)**

02 **General product information, such as name, colour, size, type/group**

03 **TARIC code**

04 **Operator and facility identifiers for production facilities and the REO, such as Global Location Number (GLN) and Economic Operators Registration and Identification (EORI)**

05 **Unique registration identifier from the EU DPP Registry**

06 **Reference to the DPP backup**

# Mandatory vs non-mandatory requirements

In the EU funded **CIRPASS-2 project** where Kezzler is one of the pilot leading companies, both mandatory and non-mandatory requirements of DPP are considered, as illustrated in Figure 2.

Companies that only meet the mandatory requirements will achieve regulatory compliance but will miss out on significant opportunities, especially those related to circular business models enabled by item-level DPP, which will be discussed later.


**Figure 2 - Credit: CIRPASS-2**

# Unique identifiers: level of granularity

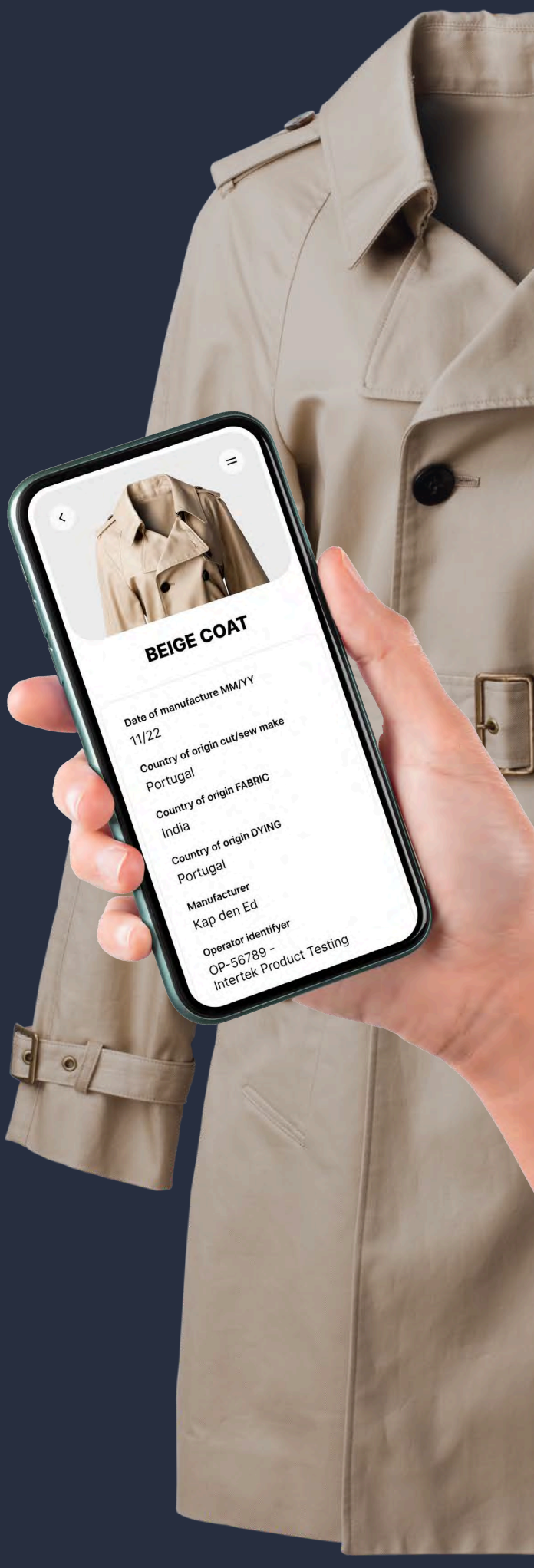
Until now, many industries have been operating with GTIN as the lowest level of granularity. However, it's not always possible to capture all supply chain information accurately at this level. For example, different production facilities could be involved in producing the same GTIN across different batches. This is why we expect batch-level/LGTIN to be the required DPP level in industries like apparel and footwear.

In other industries, where it's crucial to capture repair events and update the DPP with information on spare parts used, batch level won't suffice. Instead, item-level granularity will be required, such as recording a replaced battery on an e-scooter. This level of detail could also be beneficial for many apparel and footwear brands, and we already see today that many opt for the most granular level to be able to capture all the benefits of the DPP.

Regardless of the mandatory level of granularity, brands or REOs placing the product on the market will always be allowed to choose a more detailed level as long as the information can be aggregated up to the mandatory level.

The most detailed level – item level – offers quite a few advantages. It is much easier to find a positive ROI compared to batch or model level, which primarily impacts transparency and simple compliance with mandatory DPP requirements.

Brands that want to fully maintain a connection with each individual product after the point of sale should implement DPP at the item level. The different aspects of granularity levels are discussed in more detail at the end of this paper, in the section ***Define your circularity and digital ID strategy.***



# Reliability

The DPP system will play an important role in securing the reliability of the data, ensuring that the data are:

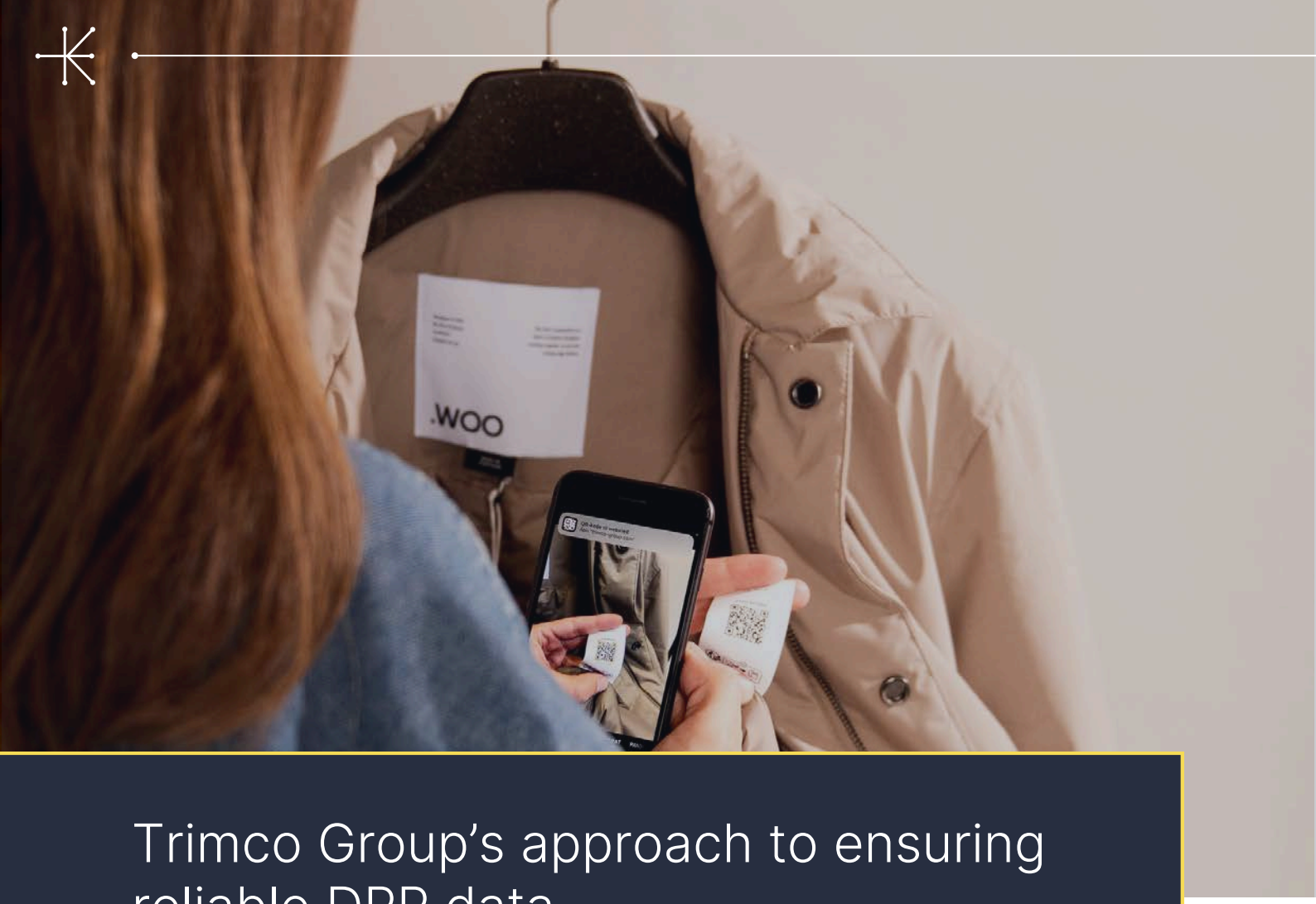
- Accurate and up-to-date
- Not tampered with once the DPP registry ID is issued
- Verified or easily verifiable

We know from other EU regulations like **GDPR** that breaches can have severe consequences. Launching products without a DPP, or with a DPP containing incorrect information, might lead to fines and/or product recalls, which can have long term damaging effects on brand equity.

In global and complex supply chains, how can REOs ensure that the data presented in the DPP is accurate and trustworthy for consumers? In some industries, it's virtually impossible to guarantee that all data is valid. Certificates can be falsified, and remote manufacturing facilities are difficult to continuously monitor. However, under ESPR, REOs are expected to take much greater responsibility for their supply chains, either directly or through partners that can audit and verify upstream data. This ensures that the data is stored and linked to each product in a trustworthy manner.

Complex supply chains are no excuse to not present correct data in the DPP, and one consequence might be that certain supply chains will have to change.

At Kezzler, we collaborate closely with partners that can audit and verify upstream data, such as **Trimco Group** in the apparel and footwear industry.




# Trimco Group's approach to ensuring reliable DPP data

Brands must indeed be careful that the DPP does not become an arena for greenwashing or bluewashing. We have seen many examples of heavy fines in the EU and US for misleading environmental claims.

To avoid greenwashing, brands need to carefully separate what is a certificated material fact from what is an extended environmental claim.

In Trimco, we ensure that material and product certifications are linked to the brands' purchase orders. We ensure that the certifications we collect follow the brands' supplier naming and their supplier codes. As a care and content supplier, we link access to words like 'organic cotton' or 'recycled polyester' to the Tier 1 certifications and/or brand certification. Therefore, a garment factory cannot add an 'organic cotton' claim on a label or in a DPP without having the proper certifications on hand. This installs a level of failsafe.

Social due diligence regulations are far-reaching in the EU and US. Trimco collects all globally recognized third-party verified social due diligence certifications and ensures they are linked to the production lot at the time of validity. This allows a brand to control that a garment factory cannot obtain labels needed for their production unless the correct social due diligence certificates are in place at the time of the bulk order. A brand can make this even stricter and demand tier 2, 3, and 4 labor to have the right documentation in place before a garment factory can proceed to finalize garment production.

In this way, a brand can ensure that its material and social claims in the DPP are accurate and true. The certifications and data are collected and processed by due diligence mechanisms as required by law.

– Camilla Mjelde, Compliance and Sustainability Director (**Trimco Group**)

# DPP timeline

The precise timeline for the implementation of DPPs across various sectors remains uncertain. However, it is known that batteries, apparel and footwear, and tyres are first in line. The European Commission anticipates that 2027 will be a pivotal year for DPP implementation. This means we will likely see the first Delegated Acts (DA) coming in late 2025 or early 2026. Eighteen months after each sector's DA is published, all new products for that sector must come with a valid DPP.

A tentative timeline, with the work of CEN/CENELEC ending in late 2025 and the introduction of DPP for the first two sectors, is illustrated in Figure 3 below (source: **CIRPASS-2**).

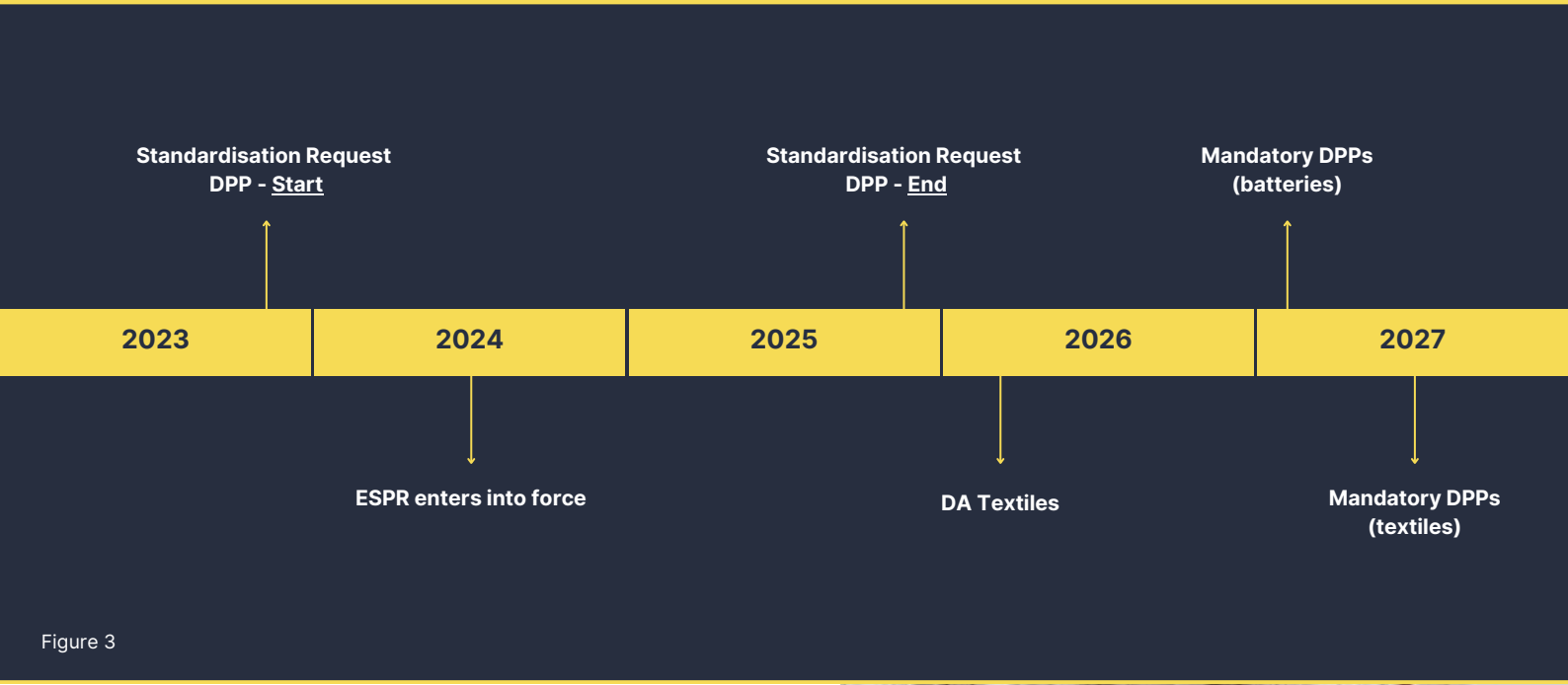



Figure 3

Some industries, like apparel (in particular, certain sportswear categories), have long lead times – sometimes up to two years from the design phase. Planning new collections that launch two years later without considering DPP is soon going to be risky and potentially very expensive. Below is a recommendation on how we believe brands should approach this task.

# What should companies do to prepare?

There are four essential steps that brands should start working on right now. This next section dives into each step in more detail.

Define your strategy

Map your supply chain

Fill the gaps

Find the right partners

# Define your circularity and digital ID strategy

In addition to the data requirements in the DPP, each sector's delegated act will also specify the layout and positioning of the data carrier.

The **requirement for a product to have a data carrier** that connects the brand with the product owner throughout its life cycle presents many opportunities; but brands first need to define their strategy.

If compliance is the only objective, minimal traceability data and basic performance requirements will suffice, allowing the selection of the required minimum granularity level. However, brands aiming to leverage DPP beyond mandatory requirements should outline and prioritise their desired use cases. This can be achieved by adopting the 10-Rs of circularity, recognizing that different categories may require different R-strategies.

Ambitious brands seeking to maximise the benefits of DPP will likely opt for item-level granularity.
Below is a brief summary of the different alternatives.


*Source: **https://www.gs1.org/standards/gs1-digital-link**

# Model-level DPP

A model-level DPP doesn't change much. The benefits are limited to ensuring compliance for product categories where this ends up being the required level of granularity; and the opportunity to provide a more relevant user experience for customers accessing the DPP.

# Batch-level DPP

A batch-level DPP, which is expected to become the required minimum level for certain sectors including apparel and footwear, adds a little more value compared to a model-level DPP.

The specific SKU as well as production process and time are clearly defined, giving more accurate information to different stakeholders. This also supports more seamless customer experiences related to circular use cases (like repair and resale).

The challenge is that data provided back to the brand will never be accurate at this level, and it still will be impossible to expand the story of the product throughout its lifecycle. Events like repairs and resales can never be stored to the relevant item.

# Item-level DPP

Item-level DPP is the lowest possible level, since it is unique to each individual product. This is the only level that fully supports real value-chain transparency and traceability while also providing many operational advantages, including:

**Manufacturing control**

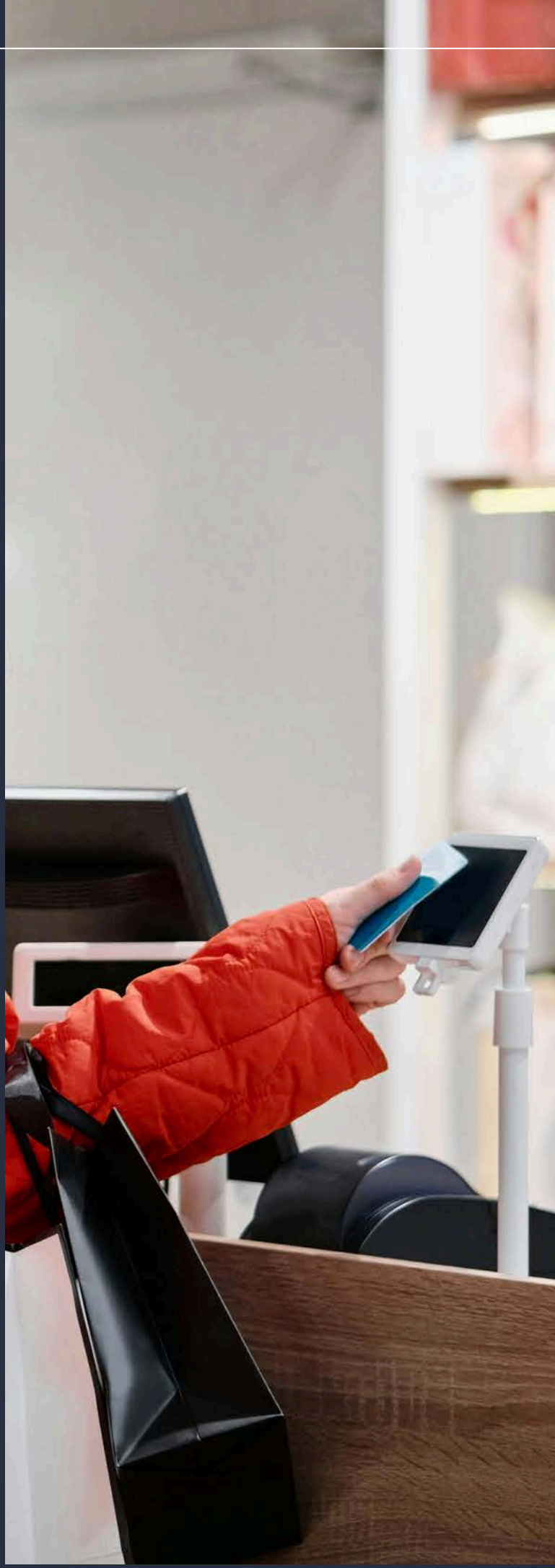
With DPP at item level, brands can have real-time data on each individual item's production status. This accuracy of information also has positive corollary effects later in the supply chain, like with more efficient goods receiving and more accurate invoicing.

**Loss prevention and warranty handling**

Item level DPPs allow POS transactions to be captured at this level, providing significant benefits related to loss prevention, returns, and warranty handling. If an item is stolen from one store, it cannot be returned at a different store or resold on a partner marketplace – the system will know that the item was not sold in the first place.

**Authenticity and brand protection**

Treating each item individually also introduces another level of security, with benefits related to brand protection and authenticity.



# Map your supply chain and fill the gaps

A natural early step for brands is to make sure the supply chain is well described and known, from the first to the last tier. A substantial part of the DPP requirements is related to upstream data transparency, where any unknowns need to be identified and addressed.

Most of the time, missing information can be captured, but it’s crucial to make sure this is done in a structured manner. Although not recommended, smaller companies might manage using Excel sheets. Most companies, however, are better off investing in **infrastructure that automates and secures the data flow** to avoid manual work and reduce the risk of errors. This requires careful planning, also taking into account the burden put on the different operators in the supply chain.

# Find the right partners

The EU is very focused on ensuring the DPP system is flexible and scalable. It’s likely that the first version of the mandatory DPP requirements will not be the final ones; adjustments will and must be made as we see the effects and learn from them.

This is an important consideration when brands/REOs search for partners and solutions to deliver on their circularity and digital ID strategy. With new ‘DPP providers’ popping up quite frequently, the landscape is unclear. This also is why having a strategy is so important; it will make it easier to target the right set of partners, whether it's an upstream data provider, a new label partner with item level capabilities, a DPP service provider, or all of them.

# Moving forward

The journey toward implementing DPPs is a significant step forward in achieving the ambitious sustainability goals set out by the European Green Deal. As we look toward 2027, the year projected to be pivotal for DPP, early preparation and strategic planning are crucial for brands and REOs. By defining a clear circularity and digital ID strategy; mapping and understanding your supply chain; addressing any gaps; and finding the right partners, companies can ensure they are not only compliant but are also ahead of the curve in fully leveraging DPP.

Acting now to integrate DPPs into your products demonstrates a commitment to transparency, sustainability, and consumer trust. This proactive approach not only aligns with regulatory requirements, but also enhances brand equity and positions your company as a leader in the circular economy.

Enabling future compliance with the EU DPP mandate is a journey that starts today, and **Kezzler** is committed to being at the forefront of developments within all applicable regulations.

**Reach out to us** for a discussion on incremental preparation that enables a future-proof DPP solution, providing benefits immediately – even before DPPs are required. Embrace this opportunity to become a more responsible brand and start your DPP implementation journey today.

# Appendices

## Glossary of Important Terminology

**Digital Product Passport (DPP)**
A structured collection of product-related, machine-readable data with a predefined scope and agreed data management and access rights, conveyed through a unique product identifier and accessible via electronic means through a data carrier.

**European Green Deal**
An ambitious plan aimed at making Europe the first climate-neutral continent by 2050, with an intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

**Ecodesign for Sustainable Products Regulation (ESPR)**
A framework outlining a set of requirements for product sustainability, requiring that products in most verticals meet these imperatives to be sold within the EU market.

**Global Trade Identification Number (GTIN)**
A unique identifier used to identify products in the supply chain.

**Responsible Economic Operators (REO)**
Entities responsible for placing products on the market, ensuring compliance with regulatory requirements and managing product-related data.

**CEN/CENELEC**
The European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC) are organisations responsible for developing and defining standards in the EU.

**Tier 1, 2, 3, 4 Suppliers**
Levels in the supply chain hierarchy, with Tier 1 being direct suppliers to the brand, Tier 2 supplying Tier 1, and so on.

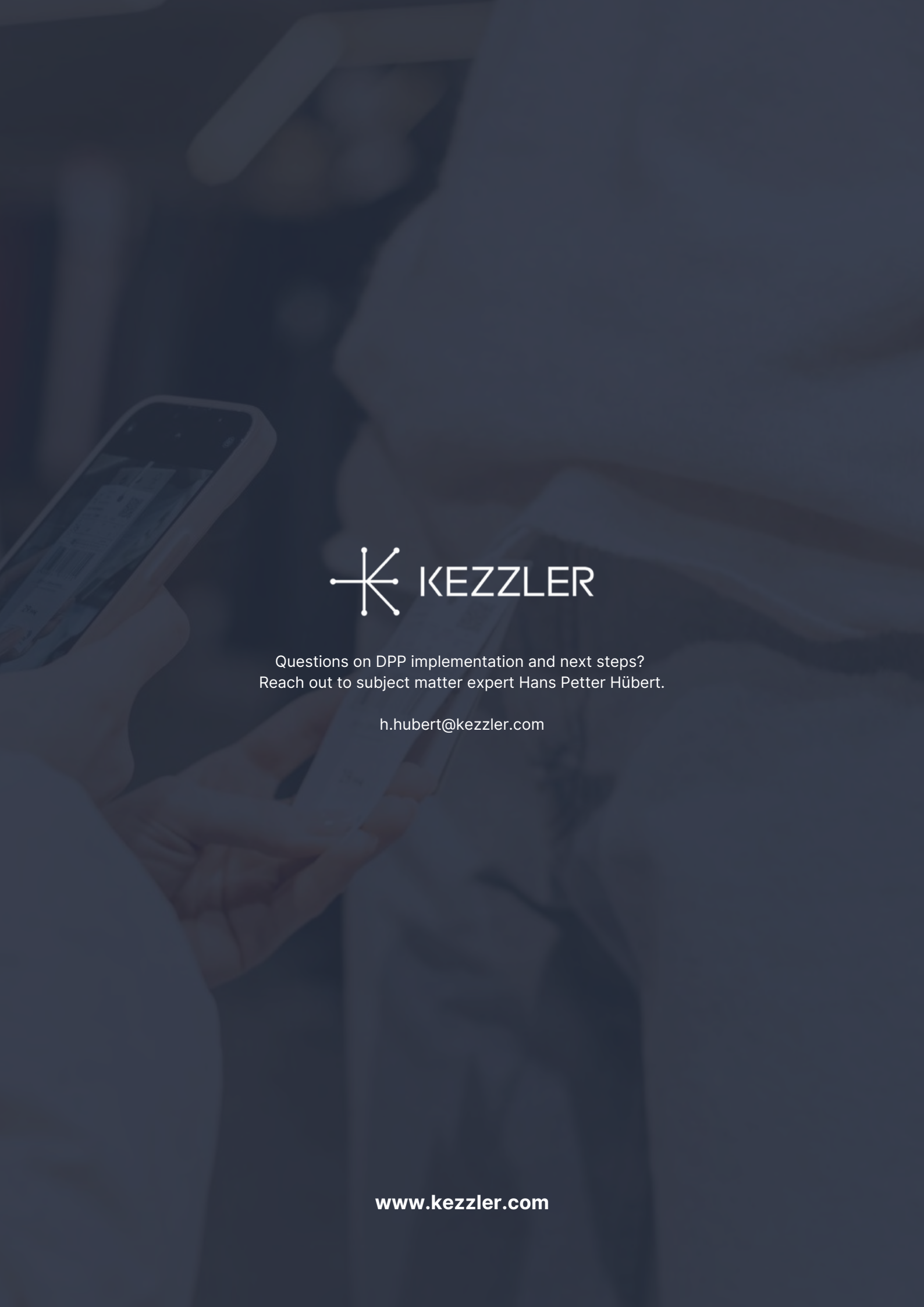
**TARIC Code**
The integrated Tariff of the European Union, a system used to identify goods and apply correct tariffs and regulations.

**Environmental, Social, and Governance (ESG) Information**
Data related to the environmental, social, and governance aspects of a company or product, used to assess sustainability and ethical impact.

**Delegated Act (DA)**
A legally binding act that allows the European Commission to amend or supplement non-essential parts of EU legislation.

**Global Location Number (GLN)**
A unique number used to identify locations and entities involved in a supply chain.

**Economic Operators Registration and Identification (EORI)**
A unique identification number assigned to businesses that undertake customs activities within the EU.



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Questions on DPP implementation and next steps?
Reach out to subject matter expert Hans Petter Hübert.

h.hubert@kezzler.com

**www.kezzler.com**