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# DIGITAL PRODUCT PASSPORT: SPECIAL EMPHASIS ON THE FASHION INDUSTRY*

*UDK / UDC: 677 : 004.6*
*677 : 502.174*
*DOI: 10.31141/zrpfs/2261*
*Izvorni znanstveni rad / Original scientific paper*
*Primljeno / Received: 30.6.2025.*
*Prihvaćeno / Accepted: 5.2.2026.*

This paper introduces the idea of the Digital Product Passport (further referred to as DPP) and its development and implementation, with a particular emphasis on the European Union market. The concept of the DPP is explored within the broader context of evolving international environmental agreements, sustainability goals, and the collective achievements in environmental protection over recent decades. By analyzing these frameworks, the paper offers insight into how the DPP aligns with global efforts to create a more transparent, circular, and sustainable economy.

Furthermore, this paper puts a special focus on the textile industry, its development, and its impact on the environment. The textile industry is examined in detail due to its development, rapid growth, complex production system, and environmental footprint. This analysis discusses how the introduction of the DPP could bring transformative changes in how textiles are produced, used, and disposed of within the European Union and beyond.

Moreover, this paper explains one of the biggest problems society faces due to excessive waste and its consequences, alongside "fast fashion" as the primary cause of huge amounts of waste on the planet. Finally, the paper deals with the legal act introducing the Digital Product Passport, i.e., the Ecodesign for Sustainable Product Regulation. This paper contains a deeper view of the CIRPASS, the project that laid the foundation for the establishment of the Digital Product Passport. The final section of the paper examines the positive outcomes of this initiative, the modality of application in real life, and the method of implementation.

**Key words:** *EU; textile industry, sustainable economy, circular economy, waste management*

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* This work has been fully supported by the University of Rijeka under the project "AI Regulation for Sustainability."

# 1. OVERVIEW OF THE TEXTILE INDUSTRY

## 1.1. The Evolution of the Textile Industry

The textile industry went through various phases before becoming one of the largest industries in the globalized world. Initially, people used the simplest equipment in their homes before the Industrial Revolution, while now robots and automation are used in factories.

Before industrialization, the entire family had to spin strands on a spinning wheel so that a middleman could buy it from them and then sell it on the market.[3] In the late 18th century, the Industrial Revolution revolutionized production all over the world. As larger workshops opened up, the main goal of employers/business owners was focusing on maximizing profits, cutting costs and depriving workers of freedom during work hours.[4] At that time, the biggest exporter of cloth and textile was Britain. Nowadays, the UK is not even in the top 10 biggest exporters of textiles.[5]

The invention of John Kay's Flying Shuttle, a machine that allowed for faster manufacture of cloth due to its pedals. In the upcoming years a great deal of machinery was invented: the Spinning Jenny by James Hargreaves, the Cotton Gin by Eli Whitney and finally Elias Howe's Home Sewing Machine. These innovations shaped the evolution of the textile industry. The following years were permeated with development of technology and the education of workers. All the mentioned above contributed to the industry as we know it today.

Not only did job descriptions change from relying on skills and craftsmanship to supervising machinery, but lifestyles also changed too. People started to move to cities so they could be closer to the factory they worked in. The countryside became abandoned, and the cities became larger and larger.[6] Urbanization rates continue to rise to this day, driven by the same factors.

Child labor was omnipresent, as no child protection laws were in place in the industrial era. They would work 12-hour shifts, only to crawl under heavy machinery to clean up waste. Education was a luxury, resulting in a big number of parents being forced to send their children to work.[7]

Moreover, through different types of industries the revolution in the 18th century had its impact on the environment. Many say it marked the beginning of prioritizing

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[3] BBC, How did the Industrial Revolution change the textile industry? available at: https://www.bbc.co.uk/bitesize/articles/zys7xbk#zfpqm39 (24.03.2025)

[4] Britannica, The Industrial Revolution, 26 July 2024, available at: https://www.britannica.com/topic/history-of-Europe/The-Industrial-Revolution (24.03.2025)

[5] Tradelmex, Biggest Textile Exporter Countries Statistics, available at: https://www.tradeimex.in/blogs/biggest-textile-exporter (23.03.2025)

[6] BBC, *op. cit.,* n. 3.

[7] World History Encyclopedia, Child Labour in the British Industrial Revolution, 12 April 2023, available at: https://www.worldhistory.org/article/2216/child-labour-in-the-british-industrial-revolution/ (24.03.2025)

production over the potential harm it could cause to people and the climate. It was the rigorous use of fossil fuels such as coal, natural gas and petroleum that started the battle that today's generations must continue fighting.[8]

### 1.2. The Downside of the Textile Industry

Nowadays, the textile industry is one of the biggest polluters in the world. In all phases of its supply chain, textile production has a negative impact on the environment. It is also important to highlight that to consume a final product, textiles need to go through a fair amount of processing and satisfy many conditions, such as high flexibility, sufficient strength and many more to go through a big number of industrial treatments and become a product consumers can buy and use.[9]

For a better understanding of this process, it is important to take a look at how it all starts with fiber, the cultivation of plants that ends up with harvesting. Let's take cotton for instance; it is grown on a bush and requires a large amount of water and sunlight to be produced. That's why the best-quality cotton is produced in Egypt. Unfortunately, to maximize production and quality, a lot of fertilizers and other chemicals are used in the growing phase.[10] In this phase, the resources of production are large amounts of water, land exploitation, the aforementioned chemicals, fossil fuels and labor, all resulting in pollution, emissions and labor exploitation.[11] By far, the usage of water leaves the biggest environmental impact in this phase of production. Most of the land sites use mechanization to supply water to plants, using large amounts of energy, especially in the drought season. On the other hand, if not set correctly, the water supply system can damage the plants and downgrade the effects of chemicals used to improve production.[12] Contrary, when not using natural fibers, for example polyester fibers, water usage is less of a concern. However, in terms of energy consumption and carbon footprint, polyester made products are far worse than those made from cotton. Furthermore, synthetic fibers, like polyester and nylon have numerous negative consequences, including ozone layer depletion, acidification, and toxicity to humans, etc.[13] Due to their production process, synthetic fibers are often overused compared to natural fibers. Polymer preparation involves oil as a source of raw material, chemical reactions between precursors and high temperatures, resulting in significant energy consumption and waste production. In conclusion, any type of fiber processing is in some way harmful to the environment.

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[8] Greenly Institute, What was the Industrial Revolution's Environmental Impact?, 26 August 2024, available at: https://greenly.earth/en-us/blog/ecology-news/what-was-the-industrial-revolutions-environmental-impact (27.03.2025)

[9] Slater, K., *Environmental Impact of Textiles, Production, Processes and Protection*, Woodhead Publishing Series in Textiles, 2003, p. 17.

[10] *Ibid*., p. 24.

[11] Patrway, S., *Clothing and Textile Sustainability: Current State of Environmental Challenges and the Ways Forward*, Textile & Leather Review, Vol. 3, No. 3/2020, p. 3.

[12] Slater, K., *op. cit.,* p. 25.

[13] Patrway, S., *op. cit.,* p. 4.

The following stages of textile production are identical. Yarn manufacturing uses a lot of energy, especially electrical and thermal energy, "machines, air conditioning, lamps used for illumination and compressors consume electrical energy while the thermal energy is consumed by air conditioning and processes such as fixation of yarns."[14] Before the discovery of synthetic dyes by Wiliam Henry Perkin,[15] clothes were dyed using natural coloring. The main resources of dye were vegetables, fruits, flowers, but also bugs, and other insects. As industry evolved and demand increased, natural resources were replaced by various chemicals to achieve faster and larger production goals.[16]

The biggest water polluter in the world is industrial waste.[17] The textile industry has a big role in that "achievement," "as it is one of the most chemically intensive industries on earth and the number one polluter of clean water (after agriculture)."[18] Except being harmful for the environment, the dyeing process has harmful consequences that can be carcinogenic for people. These chemicals not only affect the water we drink, but are also present in the air we breathe and can be absorbed through our skin.[19] There have been many polemics about consumers preferring colorized clothes over plain-white t-shirts and finding an eco-friendlier way to achieve this. This is where air-dyeing technology comes in. With this technology, no water is used in the process of dyeing textiles. Additionally,, it is beneficial in terms of energy consumption, as it does not require large amounts like conventional dyeing processes do.[20] Textile finishes, are by far, are the phase of the process that leaves the biggest mark on the environment. Textile finishes include, for example, UV protection, antimicrobial protection, water repellency, and they all contain numerous chemicals that are harmful to humans and animals.

It is important to emphasize more problems that the textile industry faces. In addition to being harmful to the environment, it also has negative impacts on society. This includes low wages, poor working conditions, long working-hours, and the lack of workers' rights to form unions in many countries where these industries are located. Despite the United Nations Convention on the Rights of the Child prohibiting work for children under 15 years old, child labor remains prevalent in the textile industries of countries like India, Uzbekistan, China, Bangladesh, Egypt, Thailand and Pakistan. This lack of progress since the 19th century is alarming.[21]

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[14] Koc, E., Kaplan, E., *An investigation on energy consumption in yarn production with special reference to ring spinning*, Fibers and Textiles in Eastern Europe, Vol. 18, No. 2/2010, p. 19.

[15] Science History Institute, William Henry Perkin, available at: https://www.sciencehistory.org/education/scientific-biographies/william-henry-perkin/ (05.03.2025)

[16] Kant, R., *Textile dyeing industry an environmental hazard*, Natural Science, Vol. 4, No. 1/2012, p. 22.

[17] Development aid, Water pollution in the world: major causes and statistics, 28 February 2024, available at: https://www.developmentaid.org/news-stream/post/152754/water-pollution-in-the-world (05.03.2025)

[18] Kant, R., *op. cit.,* p. 23.

[19] *Ibid*., p. 24.

[20] Textile today, Air-Dyeing Technology-A Review, available at: https://www.textiletoday.com.bd/air-dyeing-technology-a-review (06.03.2025)

[21] SOMO, *Child labour in the textile & garment industry, Focus on the role of buying companies*, March 2014.

Furthermore, it is devastating to note that only 1% of used clothes are recycled into new clothes, while the other 99% ends up as waste that harms our planet Earth. "Most textile industries from developing countries discharge their untreated textile waste - water directly into water sources without proper treatment, resulting in water toxicity, chemical pollution, and soil degradation."[22] This is why it is essential for society to take action. In response to this call for help, the EU passed the Directive on waste in 2018[23]. It sets targets for household waste and urgent need for recycling and reusing materials and products. In section 16, it adverts the industry waste:

"In order to promote sustainable use of resources and industrial symbiosis, Member States should take appropriate measures to facilitate the recognition as a by-product of a substance or an object resulting from a production process the primary aim of which is not the production of that substance or object if the harmonized conditions established at Union level are respected. The Commission should be empowered to adopt implementing acts in order to establish detailed criteria on the application of the by-product status, prioritizing replicable practices of industrial symbiosis. "[24]

As the situation becomes more concerning, the EU is responding with more rules and measures with a clear goal to induce amelioration. That is why on 13 March 2024, the European Parliament adopted a revision on the previously mentioned Directive on waste, which tightens up rules on waste management. The focus is mainly on food waste and waste from the textile industry. "It also sets requirements to ensure the management of textile waste in line with the waste hierarchy, including provisions to stop the practice of exports of waste disguised as being done for reuse."[25] In the European Union, textile waste is considered biodegradable waste, which includes biodegradable fibers. In simple terms, these fibers are polymeric materials that are degradable. The process of degradation can be described as "...a deleterious change in the chemical structure, physical properties, or appearanceof a polymer, which may result from chemical cleavage of the macromolecules forming a polymeric item, regardless of the mechanism of chain cleavage."[26] The drawback is that it takes a generous amount of time to decompose.[27] The European framework and legislation define the waste management hierarchy, also known as the 4R' s:

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[22] Kasavan, S. et al., *Global trends of textile waste research from 2005 to 2020 using bibliometric analysis,* Environ Sci Pollut Res Int, Vol. 28, 2021, p. 2.

[23] Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste, OJ L 150, 14.6.2018, pp. 109–140., (Directive 2018/851)

[24] *Ibid.,* recital 16.

[25] European Parliament, Legislative Train Schedule, Revision of the EU waste framework directive - textiles and food waste, available at: https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-revision-of-the-eu-waste-framework?sid=8201 (06.03.2025)

[26] Valderrama, M. A. M., Putten, R. J., Gruter G., *The potential of oxalic – and glycolic acid based polyesters (review). Towards CO2 as a feedstock (Carbon Capture and Utilization – CCU),* European Polymer Journal, Vol. 119, 2019, p. 459.

[27] Dorotić, I. et. al., *Boosting the efficient use of resources in the textile industry by moving to a circular economy*, Tekstil, Vol. 68, No. 10-12/2019, p. 237.

1. Reduce - produce a lesser amount of waste
2. Reuse - finding a new use for already used products
3. Recycle – a transforming product into raw material
4. Recover.[28]

Even though most textile industries are located in undeveloped countries, resulting in decreased waste in Europe, the problem remains with textile products discarded by European citizens after use. Globalization influenced the relocation of the textile industry to low and middle-income countries, also known as LMICs, due to cheap labor and less regulated worker rights. Forerunner countries are China and Bangladesh, manufacturing a significant portion of the 80 billion new clothing items made annually worldwide.[29] Some researchers estimate that average labor costs in Germany are around $18/hour, compared to $0.40/hour in China and India.[30] Fast fashion relies on "…cheap manufacturing, frequent consumption and short-lived garment use."[31] It is, of course, the carefully designed targeting and implementation of marketing campaigns that produce the mindsets of consumers to purchase clothes without considering the impact of their purchases. The focus is on the customer's behavior and their will to buy clothes over and over again, rather than on the product.[32] This type of "pattern " results in catastrophic outcomes for the environment, with over 92 million tons of textile waste produced annually, including the unsold products.[33]

Another thing to consider is packaging waste, which is closely linked to the textile and clothing industry. As online shopping increased, so did the packaging waste, with rates rising by over 20% in the past 10 years. The main focus is on plastic packaging and developing strategies to replace it with more eco-friendly materials.[34] Two specific rules will be implemented to address this issue:

1."Ban different types of plastic packaging: very lightweight plastic carrier bags, plastic packaging for fresh fruit and vegetables, small individual portions for sauces, sugar and similar products, miniature packaging for toiletry products, and plastic wrapping for suitcases in airports from January 2030,"

and

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[28] *Ibid*., pp. 237-240.

[29] Bick, R., Halsey, E., Ekenga, C.C., *The global environmental injustice of fast fashion,* Environmental Health, Vol. 17, 92/2018, pp. 1-2.

[30] Ghemawat, P., Nueno, J. L., *ZARA: Fast Fashion*, Harvard Business School, 2003 (revised 2006), p. 21, available at: https://didierdiaz.com/wp-content/uploads/2019/10/Zara-fast-fashion-Case-study-HVR.pdf, (05.03.2025)

[31] Niinimäki, K. et al., *The environmental price of fast fashion*, Nature Reviews Earth Environment, Vol. 1, 4/2020, p. 189.

[32] *Loc. cit.*

[33] *Loc. cit.*

[34] European Parliament, How to reduce packaging waste in the EU (infographics), November 2023, available at: https://www.europarl.europa.eu/topics/en/article/20231109STO09917/how-to-reduce-packaging-waste-in-the-eu-infographics (06.03.2025)

2.“Ban from January 2030, persistent pollutants (also known as forever chemicals) used to fireproof or waterproof food packaging that might affect our health.“[35]

### 1.3. Managing the Consequences of the Industry

Whether through a dramatic increase in temperatures, a warming, rising ocean, water shortages, or through world hunger and poverty, the reality we cannot ignore is that the Planet Earth, as we know it, is rapidly disappearing. However, it was not long ago that one of the most influential politicians in the world sat around the table and, for the first time, discussed the strategy and process of preserving the betterment of the Planet Earth. With its symbolic name,“ the First Earth Summit” took place in Stockholm, Sweden, in June 1972 as one of the UN Scientific Conferences.[36] It was the first time the environment was in the spotlight for human kind.

At the UN Scientific Conference, with its symbolic name “the First Earth Summit,” The Declaration of the United Nations Conference on the Human Environment raised awareness about climate change. The Declaration emphasized the importance of man as a “creature and molder of his environment”[37] and introduced 26 principles to better the connection between the environment and human kind.[38] Nowadays, the Earth Summit or also known as the United Nations Conference on Environment and Development (UNCED), is held every several years in countries all over the world.

As years passed, awareness for the endangerment of the environment enhanced, as well as legal and political efforts to save it. In 2015 the Paris Agreement was adopted by 196 countries and it came into force on 4 November, 2016. The most significant conclusion for the universal progress on climate change is outlined in Article 2 of the Agreement, which states, “Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.“[39] With this, the Agreement highlighted the individual responsibility of each signatory state to combat climate change. It introduced the requirement for countries to bring their NDCs (nationally determined contributions) to a certain level, otherwise the main goal of the Paris Agreement will not be satisfied and temperatures will exceed 2°C.[40]

[35] European Parliament, Deal on new rules for more sustainable packaging in the EU, available at: https://www.europarl.europa.eu/news/en/press-room/20240301IPR18595/deal-on-new-rules-for-more-sustainable-packaging-in-the-eu (06.04.2025)

[36] United Nations, UN Chronicle, From Stockholm to Kyoto: A Brief History of Climate Change, available at: https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change (25.04.2025)

[37] available at: https://www.un.org/en/conferences/environment/stockholm1972 (05.04.2025)

[38] *Loc. cit.*

[39] available at: https://treaties.un.org/doc/Treaties/2016/02/20160215%2006-03%20PM/Ch_XXVII-7-d.pdf, (25.04.2025)

[40] Streck, C., Keenlyside, P., von Unger, M., The Paris Agreement: A New Beginning, Journal for European Environmental & Planning Law, Vol. 13, No, 1/2016, pp. 3-29.

As aforementioned, the Paris Agreement is an international treaty, however, as an annex to the decision made by the COP (Conference of the Parties) to the UNFCCC (United Nations Framework Convention on Climate Change), it also adopted a decision on implementation guides, known as the Paris Decision.

## 2. CIRCULAR ECONOMY AS A NEW WAVE IN ECO-FRIENDLY PRODUCTION

Unlike a linear economy, which is "...built on a model of extracting raw materials from nature, turning them into products, and then discarding them as waste,"[41] a circular economy consists of reusing materials, eliminating a large percentage of created waste, and insisting on using natural resources. In the textile industry, or more specifically, in the fashion industry, it means using "...renewable feedstock for plastic-based fibers and not using fossil-fuel-based fertilizers or pesticides in the farming of biologically based input."[42] This approach allows for maintaining production at a certain level that meets market demands while having less impact on the climate. Of course, not everyone believes in the benefits of the circular economy. Some argue that it represents an "ecological modernization project that builds on capitalist economic growth narratives."[43]

Numerous schools of thought preceded the theory of the circular economy; however, most resources point to two environmental economists, David Pearce and Richmond Turner. Nonetheless, they cannot be defined as the founders of this concept because they based their work on many other already established studies, such as Kenneth Boulding's, Greyson's, Heshmati's, and many more. The concept of the circular economy has been in development since the 1970s and is nowadays a topic that cannot be avoided when discussing production, industry, sustainability, and the future.[44]

However, in line with its customary and well-known principles, the European Union is dedicated to enhancing society and the environment. In March 2020, the European Commission adopted the Circular Economy Action Plan (CEAP) as a component of the Green Deal framework. This plan outlines a strategy for transitioning the economy to a circular model across all EU member states. It includes all phases of production, from product development and designing, to

[41] UNDP, Climate Promise, What is circular economy and why does it matter?, 24 April 2023, available at: https://climatepromise.undp.org/news-and-stories/what-is-circular-economy-and-how-it-helps-fight-climate-change (27.04.2025)

[42] Fashion and the circular economy – deep dive, available at: https://www.ellenmacarthurfoundation.org/fashion-and-the-circular-economy-deep-dive (27.04.2025)

[43] Jaeger-Erben, M. et al., *There is no sustainable circular economy without a circular society*, Resources, Conservation and Recycling, 168, 2021, pp. 2–6.

[44] Wautelet, T., The Concept of Circular Economy: its Origins and its Evolution, 2018, available at: https://www.researchgate.net/publication/322555840_The_Concept_of_Circular_Economy_its_Origins_and_its_Evolution (05.04.2025)

production and distribution.[45] Within the CEAP, specific aims and objectives are outlined for key products, such as Electronics and ICT, Batteries and vehicles, packaging, and many more. The plan is based on four key principles:

1. zero-waste economy, the product is designed to be reused;
2. simple products are designed to be degraded, while more complex products are designed to be reclassified into simple products;
3. the energy resources used for production are renewable;
4. after use, consumers will return the product so that it can be recycled.[46]

Besides that, one of the priorities of this model is to achieve the production of long-lasting products, with better quality and eco-friendly materials. This means that customers will be buying goods that are better for them, with fewer unhealthy chemical contents. The downside is higher prices and the need to change the habit and mindset of supporting fast fashion.[47]

The model also puts special emphasis on waste management, with a heading "LESS WASTE, MORE VALUE." It describes of the creation of the EU market for secondary raw materials, and discusses the support of waste prevention and circularity.[48]

The CEAP also mentions the role the circular economy will play in creating new work opportunities. Studies show that by 2030, there will be more than half a million new jobs available in industries that use the circular economy model.[49] However, this progress may not be universal. Most research papers are based on countries in North America, Europe, and Australia, leaving the rest of the world with less progress and adaptability.[50]

It is important to emphasize the role that people and society will play in accepting the new model of the economy. While it will lead to better product quality, there will be a period of adjustment required. Having that "...the involvement of people, regions, and cities is critical to ensuring the full circularity of the economic system,"[51] the CEAP has predicted a number of projects that will expand knowledge of this economic model. This will be supported by the European Social Fund Plus.[52] The fund in question serves as a foundation for all EU projects aimed at creating a greener and more digital European Union.[53]

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[45] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A New Circular Economy Action Plan, Brussels, 11.3.2020,COM(2020) 98 final, (A New Circular Economy Action Plan), p. 1.

[46] Dorotić, I. et al., *op. cit.,* p. 238.

[47] *Ibid.*

[48] A New Circular Economy Action Plan, *op. cit.*, p. 1.

[49] *Ibid.,* p. 4.

[50] Circle Economy, Can a circular economy create good jobs? New study reveals Global North bias, 9 February 2024, available at: https://www.circle-economy.com/news/can-a-circular-economy-create-good-jobs-new-study-reveals-global-north-bias (29.04.2025)

[51] A New Circular Economy Action Plan, p. 3.

[52] *Ibid.*, p. 8.

[53] Climate ADAPT, European Social Fund Plus, 14 May 2024, available at: https://climate-adapt.eea.europa.eu/en/mission/funding/opportunities/european-social-fund-plus (01.04.2025)

### 2.1. Croatia: Transition to Circular Economy as a Small and Young Country

Croatia has always been open to sustainability and protective of its numerous natural beauties. Despite being a young country, since gaining independence, Croatia has actively supported international movements regarding environmental protection. For example, Croatia participated in the Earth Summit in 1992, where Agenda 21[54] was accepted. That same year, the Croatian parliament adopted, as one of the first documents, the Declaration on Environmental Protection, demonstrating its commitment to being eco-friendly. Following Croatia's joining the European Union and experiencing much-needed economic and environmental growth, the National Environmental Strategy was adopted in 2002, which was "…avant-garde in its message that economic growth should be achieved in Croatia without a proportional increase in material and energy consumption or environmental pressures. "[55] Since its membership in the EU, Croatia, like other member states, has the obligation to prepare a document, a program, every year. It is called the National Reform Programme, which is part of the national country reports submitted to the European Commission for examination.[56] As years went by, the term "circular economy" has gained significant power in the Croatian economy and society. This was deliberated in the Waste Management Plan of the Republic of Croatia for the period 2023-2028.[57] This Plan was a result of the implementation of a project focused on implementing the circular economy concept. This initiative was guided by the fact that Croatia produces 6 million tons of waste annually and heavily relies on landfills for waste management.[58] The major influence in adopting a new model of production within the circular economy was the European Green Deal and the new Circular Economy Action Plan. The Croatian Ministry of Environmental Protection and Energy adopted two key documents regarding circular economy: the Proposal of the Environmental Protection Plan until 2020 and the Integrated National Energy and Climate Plan 2021-2030.

### 2.2. Ecodesign for Sustainable Products Regulation

In order to achieve all the goals outlined in various agendas and regulations within the European Union, a "twin transition" has emerged as a synonym for a

[54] *Ibid.,* p. 2.

[55] Švarc, J., *Policy Framework for Implementation of a Circular Economy in Croatia: Past, Present and Future*, Socijalna ekologija, Vol. 31, No. 2/2022, p. 205.

[56] POLO-Cro28, Government of the Republic of Croatia adopts its National reform programme and Convergence programme, 27 April 2018, available at: https://polocro28.irmo.hr/government-of-the-republic-of-croatia-adopts-its-national-reform-programme-and-convergence-programme/ (09.04.2025)

[57] Plan gospodarenja otpadom Republike Hrvatske za razdoblje 2023. - 2028. godine, Narodne novine 84/23, 104/25.

[58] Ministarstvo zaštite okoliša i zelene tranzicije, Primjena koncepta kružnoga gospodarstva u gospodarenju otpadom, 16.11.2022, available at: https://mzozt.gov.hr/vijesti/predstavljeni-rezultati-projekta-primjena-koncepta-kruznoga-gospodarstva-u-gospodarenju-otpadom/9017 (09.04.2025)

sustainable future. This transition represents both green and digital initiatives to work towards climate neutrality in the coming years. To fulfill the twin transition theory, some elements need to be put in place. This includes technological advancements, along with security and privacy conditions. Moreover, continuous improvement and research are key to keeping pace with new technologies. Social aspects are also crucial, particularly in terms of raising awareness, changing common behaviors, and sharing data.[59]

To effectively accomplish the twin transition, the European Commission has introduced the Digital Product Passport as part of the Ecodesign for Sustainable Product Regulation. This Regulation consists of measures aimed at achieving climate neutrality along with other goals set out in the Circular Economy Action Plan. It entered into force on 18 July 2024, replacing the Ecodesign Directive 2009/125/EC.[60]

As the Digital Product Passport is a component of the Ecodesign for Sustainable Product Regulation, there are certain rules that will be enforced during its implementation. Regulations in the European Union are legally binding. Unlike directives, which set up goals for member states to achieve through their own laws, regulations are uniformly applied in their entirety across the member states. In other words, the Ecodesign for Sustainable Product Regulation will be implemented consistently throughout the European Union. However, since it's a framework legislation, the purpose of this legislative act will be assessed over time, and the rules will be continuously evolving in the long run.[61]

## 3. DPP – AS A DATA CARRIER

When legislators developed the concept of the Digital Product Passport, their main gola was to facilitate the transition to a circular economy, including assistance to businesses in implementing circular business models and changing customer behavior.[62]

The Digital Product Passport (DPP) is, in some aspects, a data carrier. It contains information about the product, manufacturer, composition, substances of concern, toxicity, and sourcing. Annex III of the Ecodesign for Sustainable Product Regulation outlines all the information requirements the DPP must carry, such as:

[59] Muench, S. et al., *Towards a green and digital future*, Publications Office of the European Union, Luxembourg, 2022, p. 4.

[60] European Commission, Ecodesign for Sustainable Products Regulation, available at: https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/sustainable-products/ecodesign-sustainable-products-regulation_en (21.04.2025)

[61] SIDELY, With Ecodesign for Sustainable Products Regulation, EU Will Impose Ecodesign Requirements on Virtually All Products Sold in EU, 18 July 2024, available at: https://www.sidley.com/en/insights/newsupdates/2024/07/with-ecodesign-for-sustainable-products-regulation (24.04.2025)

[62] Digitallink, Introducing the European Digital Product Passport (DPP), available at: https://digital-link.com/product-passport/european-digital-product-passport-dpp/ (27.04.2025)

"(b) the unique product identifier at the level indicated in the applicable delegated act adopted pursuant to Article 4;

(c) the Global Trade Identification Number as provided for in standard ISO/IEC 15459-6 or the equivalent for products or their parts;

(d) relevant commodity codes, such as a TARIC code as defined in Council Regulation (EEC) No 2658/871;

(e) compliance documentation and information required under this Regulation or other Union law applicable to the product, such as the declaration of conformity, technical documentation or conformity certificates;

(f) user manuals, instructions, warnings or safety information, as required by other Union legislation applicable to the product;

(g) information related to the manufacturer, such as its unique operator identifier and the information referred to in Article 21(7);

(h) unique operator identifiers other than that of the manufacturer;

(i) unique facility identifiers;

(j) information related to the importer, including the information referred to in Article 23(3) and its EORI number;

(k) the name, contact details and unique operator identifier code of the economic operator established in the Union responsible for carrying out the tasks set out in Article 4 of Regulation (EU) 2019/1020, or Article 15 of Regulation (EU) […/…] on general product safety, or similar tasks pursuant to other EU legislation applicable to the product."[63]

However, more details concerning every product category will be specified in the future, through individual delegated acts. Delegated acts, unlike regulations and directives, are non-legislative acts. These types of acts represent "decisions that are adopted, generally by the European Commission, following delegation (delegated acts) or in order to implement a legislative act (implementing acts)."[64] In this case, delegated acts will provide additional technical instructions and guidance on e.g. product groups definition, testing, measurement or calculation standards or methods to be used, transitional methods, harmonised standards, etc.[65]

## 4. DPP – IN A REAL WORLD

As previously mentioned, DPP will be entirely digital. In other words, it will be contained within a QR code. By scanning the code, consumers or stakeholders

[63] Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC (Proposal), ANNEX III, COM/2022/142 final

[64] Treaty on the Functioning of the European Union (consolidated version 2016), OJ C 202, 07/06/2020, art. 289.

[65] Proposal, ANNEX VI

will be able to access all needed information about a product. The DPP provides "structured, updated, and reliable data storing information about an item's origin, composition, manufacturing processes, characteristics, duration, maintenance and disassembly directions, recycling instructions, and virtually any relevant detail for different actors in the value chain."[66] There are good reasons behind using QR codes. These include cost-effectiveness, user-friendliness, consumer engagement, and ease of implementation. These factors make them accessible to the majority of DPP users.[67]

By the year 2030, every textile product in the European market will be required to have DPP. This means that companies do not have much time to prepare the ground for these major changes, or their products will not be allowed for sale in the European Union. Consequently, many companies have already started developing strategies for implementing DPP on their labels. "Trace4Value" is a project that provides help to stakeholders in successfully navigating the world of DPP. This project is part of the RISE Research Institutes of Sweden, which contributes to a sustainable future by offering assistance to various industries and promoting sustainable solutions.[68]

## 5. DPP – AS A POSITIVE CHANGE

Introducing a circular economy model into the years and centuries of established linear model of producing goods is one of the biggest challenges society has to overcome. With legislative efforts coming from the European Commission and the European Parliament, there's light at the end of the tunnel for ensuring a brighter future for generations to come in terms of climate neutrality. The first big step was to provide society with information about the products they are purchasing and using. With that information, consumers and industries can take a step closer to a greener future. DPP does exactly that. It offers users all the needed information to make a conscious purchase. All that is left is to hope society will act in a conscientious manner and be a part of the mission to save the Planet.

On the other hand, discussing brands and industries that will fall under the legislation of the DPP, another positive outcome is a data archive on their products. This means that businesses will have the "ability to store, process, and apply data as required for complex value chain creation. Increased knowledge and insight can improve both product and process management on circularity in terms of material

[66] Digitallink, n. 62.

[67] All4Labels, Digital Product Passport: Enabling sustainable products with QR Codes, available at: https://qrmarketing.com/blog/4MjaLHjFddE7fdTFUse6cQ (28.04.2025)

[68] Trace 4 value, Traceability for sustainable value chains, available at: https://trace4value.se/ (29.04.2025)

sourcing, durability, material efficiency, and product and material recyclability."[69] This can result in better productivity of production, higher quality goods, and more satisfied employers, as well as creating more space for new businesses. Moreover, investors will also have a good opportunity to inspect the potential of the product because the DPP will provide them with quality information.

Another benefit of the DPP is consumer engagement. One of the goals is to create conscious purchasing behavior, particularly when it comes to clothing items. With fast fashion entering the 21st century, consumers' approach to shopping is crucial to be regulated. Through the DPP, consumers will have greater access to information about the environmental impact of their chosen products, enabling them to make the right decision rather than buying impulsively. Additionally, manufacturers and businesses will have the opportunity to create stronger connections with customers and improve their performance. With this transparency, businesses will build trust and loyalty among buyers and users of their products.[70]

Nevertheless, DPP will enable quick reaction to potential errors in the manufacturing of a product or offer improvements to it. With new technologies and everyday inventions, it will be easier to implement new models corresponding to the production of goods, assuming these new ways are beneficial to Planet Earth.[71]

Furthermore, it didn't take long for investors to accept DPP and make it one of their income sources. With a simple internet search, you can find an abundance of "support providers" for companies and business owners. These platforms offer digital solutions for implementing DPP into the business plan,[72] primarily focusing on inventing mobile apps for scanning QR codes that connect products with their DPP.

Another outcome of the DPP will most likely be the reduction of "knockoffs" and "counterfeit" products. With the ability to directly and easily check the product's origin, customers will have the opportunity to buy original designer products.[73]

Founded by the European Commission, CIRPASS was a project that lasted 18 months. It involved 31 partners from various sectors, including industrial, digital, and international. The main purpose of this project was to construct the prototype of the DPP and determine how it will be implemented.[74] One of the key research reports of the CIRPASS was "Exploring possible Digital Product Passport (DPP)

[69] University of Cambridge Institute for Sustainability Leadership (CISL) and the Wuppertal Institute, Digital Product Passport: the ticket to achieving a climate neutral and circular European economy? Cambridge, UK: CLG Europe, 2022, p. 12.

[70] Bluestone PIM, Digital Product Passport: A Sustainable Revolution [2024 Guide], 2 August 2024, available at: https://www.bluestonepim.com/blog/digital-product-passport#benefits-of-digital-product-passport (31.04.2025)

[71] *Loc. cit.*

[72] Digitalna putovnica proizvoda: Što je to? (2024), available at: https://piconext.com/hr-HR/article/digital-product-passport/ (31.03.2025)

[73] Certilogo, 3 things brands need to know about Digital Product Passports, available at: https://discover.certilogo.com/blogs/insights-blog/unlocking-long-term-value-3-things-brands-need-to-know-about-building-a-digital-product-passport-strategy (14.04.2025)

[74] CIRPASS, About CIRPASS, available at: https://cirpassproject.eu/about-cirpass/ (26.04.2025)

use cases in battery, electronics, and textile value chains.“ Regarding the textile sector, the report points out that every year, one person in Europe produces 15 kilograms of textile waste. Despite Europe being one of the largest textile importers, most of the textile waste is transferred outside of European borders. The report suggests four ways to contribute to a circular economy model:

- rent a piece of clothing;
- resale a product that consumers no longer use;
- instead of throwing it away when it breaks down, repair it
- find a new way to use certain products.

It also emphasizes many advantages of second-hand textile consumption. While it is most prevalent in the Nordic states, the trend of reusing clothing pieces is becoming more popular in society. This can be done through C2C (consumer to consumer) platforms, where consumers sell to each other, or simply by organizations that collect clothing from all over the world and sell it in stores and online boutiques.[75] The CIRPASS report describes the process that a textile product goes through when correctly separated into the appropriate container. Workers in textile wholesale collect the waste and examine certain criteria of the product. In other words, they check the condition of the product, its shape, color, and stains, etc. “After manual sorting, around 50-60% of textiles are labeled as reusable, 35% are recycled, and 15% are incinerated, put into landfill, or go to energy recovery.“[76] Moreover, it will enable consumers to opt for higher quality materials that can be reused, as detailed information will be provided on the specific product. The report states many advantages of the DPP and its role in the circular economy. However, there are obstacles that need to be addressed. For example, the DPP will be displayed as a QR code, and in the case of most consumers, it is expected that most consumers will discard the label containing the DPP and its data after purchasing the product. In this way, once the time comes to potentially recycle the products, all the needed information will be unavailable. The DPP also requires big investments for brands and wholesalers. This means employing more staff and funding more projects that will focus only on implementing the DPP.[77]

Unfortunately, producing fake designer bags is easy, just as making fake DPP with incorrect information can lead consumers to make unwanted decisions. With companies implementing DPP into their business, fraudsters will clone QR codes and abuse the trust of customers.[78] Only when the market is accustomed to using the DPP can the problems and obstacles be solved.

[75] CIRPASS, D2.2 Exploring possible Digital Product Passport (DPP) use cases in battery, electronics, and textile value chains, March 2024, pp. 61–64.

[76] *Ibid.,* p. 69.

[77] *Ibid.,* p. 74.

[78] Certilogo, n. 73, (14.04.2025)

## 6. DPP - THE BACKGROUND

Since the end of the 20th century, sustainability has been a topic of debate in international committees and organizations. Since then, many legal acts have been passed not only on the international level, but also in countries around the world. In the European Union, special focus is given to actions aimed at saving the environment. Numerous legal acts have been passed with the main purpose of finding new ways to maintain our current quality of life or improve it, while minimizing or eliminating negative consequences on the climate.

The textile industry has faced numerous calls for action, as it is one of the biggest polluters among all industries. A major step taken by the European Union is the introduction of the Digital Product Passport. It aims to transition the industry towards a circular economy model, which focuses on using and reusing goods instead of discarding them after minimal use. Additionally, the DPP will enable customers to know what products they are buying and consuming, as well as guide them to recycle.

### 6.1. The United Nations: Where It All Started

Whether through a dramatic increase in temperatures, a warming, rising ocean, water shortages, or world hunger and poverty, the reality we cannot ignore is that Planet Earth, as we know it, is rapidly disappearing. However, it was not that long ago that one of the most influential politicians in the world sat around a table and, for the first time, discussed the strategy and process of preserving the betterment of the Planet Earth. With its symbolic name, "the First Earth Summit" took place in Stockholm, Sweden, in June 1972 as a UN Scientific Conference.[79] It was the first time that the environment was in the spotlight for human kind.

The Declaration of the United Nations Conference on the Human Environment was adopted at the Conference, raising awareness about climate change and encouraging present countries to address future environmental issues. The Declaration emphasized the importance of man as a "creature and molder of his environment,"[80] and introduced 26 principles to improve the connection between the environment and human kind.[81] Nowadays, the Earth Summit, also known as the United Nations Conference on Environment and Development (UNCED), is held every several years in countries worldwide. The biggest one was held in Rio de Janeiro in 1992, and it aimed to "reconcile worldwide economic development with

[79] United Nations, UN Chronicle, From Stockholm to Kyoto: A Brief History of Climate Change, available at: https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change (25.04.2025)

[80] Available at: https://docs.un.org/en/A/CONF.48/14/Rev.1 (24.04.2025)

[81] *Loc. cit.*

protection of the environment."[82] More than 100 heads of state were present, and they signed five essential documents: The Rio Declaration, Agenda 2, a Framework Convention on Climate Change, a Framework Convention on Biological Diversity, and a Statement of Principles on Forests.

The most recent conference was held in Stockholm to commemorate the 50th anniversary of the First Earth Summit. It established many targets and confirmed previous concerns, such as the existence of the triple planetary crisis (which consists of climate change, pollution, and biodiversity loss[83]). The Conference also "…resulted in a Stockholm+50 "Agenda for Action, Renewal and Trust," which includes final recommendations, which were summarized by co-presidents from Sweden and Kenya in the closing plenary, to achieve the vision of a healthy planet for all as our responsibility and our opportunity."[84]

The United Nations has been creating various agendas and guidelines for the development of society since its inception in 1945. With its earliest goals on maintaining world peace and more recent focus on sustainable development, the UN is one of the largest international organizations. Through organizing summits, conferences, and similar events, and adopting numerous rules and regulations, the UN is dedicated to improving the quality of life.[85] In 2015, the UN adopted the Agenda for Sustainable Development, which highlights people, planet, prosperity, peace, and partnerships as its main focus areas. It consists of seventeen goals, all aligned with these focus points. Goal 12 addresses the issue of sustainable production in less developed countries and encourages it in all others, welcomes the use of natural resources, and emphasizes the importance of waste management improvement. Moreover, the Agenda also emphasizes the value of educating companies, industries, and the general public about sustainable production.[86] Within Goal 12, the Agenda references The 10 Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP), which was adopted in Rio in 2012 at the United Nations Conference on Sustainable Development. This framework is divided into bodies with specific tasks and obligations. The 10-member Board oversees the operational tasks of the 10YFP Trust Fund, and it regulates potential new focus areas for the 10YFP. As per the Secretariat, the United Nations Environment Programme is responsible for carrying out these duties. This includes organizing regional meetings, webinars, and consulting workshops for governments and stakeholders. Moreover, the Inter-Agency Coordination Group, consisting of

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[82] Britannica, United Nations Conference on Environment and Development, Encyclopedia Britannica, July 1, 2024, available at: https://www.britannica.com/event/United-Nations-Conference-on-Environment-and-Development (25.04.2025)

[83] United Nations, Climate Change, What is the Triple Planetary Crisis, 13 April 2022, available at: https://unfccc.int/news/what-is-the-triple-planetary-crisis (27.04.2025)

[84] Stockholm +50, 12 July 2022, Why does Stockholm+50 matter? What did it achieve? What does it offer going forward?, available at: https://www.stockholm50.global/news-and-stories/why-does-stockholm50-matter-what-did-it-achieve-what-does-it-offer-going-forward (30.04.2025)

[85] United Nations, About Us, available at: https://www.un.org/en/about-us (30.04.2025)

[86] Tipping, A., Wolfe, R., Transforming our world: the 2030 Agenda for Sustainable Development, A/RES/70/1, 2015.

19 UN bodies, is tasked with publishing or reviewing documents concerning the goals and vision of the 10YFP. The structure of the 10YFP also includes National and Stakeholder Focal Points, which represent meetings of delegates nominated by each member state.[87]

Growing awareness of environmental degradation has led to increased legal and political efforts, culminating in the adoption of the Paris Agreement in 2015, which commits states to keeping the global temperature increase well below 2°C and assigns them individual responsibility through nationally determined contributions.

### 6.2. The European Green Deal

Ursula von der Leyen, the President of the European Commission, has expressed the wish and the need for Europe to become the first climate-neutral continent in the world. With this goal in mind, the European Union has announced a more thorough fight for the planet.[88] The European Climate Law was set out in Regulation (EU) 2021/1119 of the European Parliament and of the Council on 30 June 2021. This regulation sets the framework for achieving climate neutrality and amends Regulations (EC) No 401/2009 and (EU) 2018/1999, supporting objectives that have been mentioned many times in previous international law documents. The Regulation also emphasizes the importance of climate diplomacy, which should reflect international determination to achieve climate neutrality.[89] Article 7 outlines the process for examining the efforts of each member state in working towards this goal.

Just as the New Deal, led by U.S. President Roosevelt, aimed to save America from the Great Depression in 1929, the EU's Green Deal seeks to rescue its member states and others from climate change and its negative impact.[90] The Green Deal represents a package of measures adopted by the European Commission in 2020. It sets out an ambitious plan to achieve climate neutrality by 2050.[91] In response to the European Parliament's declaration of a climate emergency in 2019, the goal for Europe to become climate-neutral by 2050 came into life. However, prior to 2050, the Green Deal sets out the goal to reduce emissions by 55% by 2030.[92]

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[87] UNDESA, The 10 Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP), 2014.

[88] European Commission, Press remarks by President von der Leyen on the occasion of the adoption of the European Green Deal Communication, 11.11.2019, available at: https://ec.europa.eu/commission/presscorner/detail/fr/speech_19_6749 (16.04.2025)

[89] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), OJ L 243, 9.7.2021, recital 16.

[90] Enel, The European Green Deal: How the 27 EU countries are preparing for 2050, 17 April 2023, available at: https://www.enel.com/company/stories/articles/2023/04/european-green-deal (21.04.2025)

[91] EIPA, European Institute of Public Administration, The European Green Deal, available at: https://www.eipa.eu/areas-of-expertise/eu-law-and-policies/european-green-deal/ (21.04.2025)

[92] European Parliament, Green Deal: key to a climate-neutral and sustainable EU, 22 June 2022, available at: https://www.europarl.europa.eu/topics/en/article/20200618STO81513/green-deal-key-to-a-climate-neutral-and-sustainable-eu (01.04.2025)

One of the conditions to achieve that is having enough funds to cover all the transitions, projects, and support vulnerable groups. That is why there are multiple funds created, the most important ones are: the Just Transition Fund, Social Climate Fund, EU Solidarity Fund and EU Civil Protection Mechanism. The Just Transition Fund was set up as a part of the Just Transition Mechanism, which was created to secure €55 billion by 2027 in order to help citizens and companies.[93] The Social Climate Fund has received big support from many organizations, e. g. World Wide Fund for Nature (WWF) and the European Anti-Poverty Network. It focuses on micro-enterprises, households in need, and transport users.[94] Lastly, when discussing the EU Solidarity Fund and EU Civil Protection Mechanism, member states can use funds for disasters caused by climate change as a consequence.[95]

EU funding is directly managed by the European Commission, and among the many types of funding available, grants fall under the category mentioned above. This is important when discussing the use of funds and their supervision. "Grants are based on the costs actually incurred by the beneficiaries for carrying out the activities."[96]

On the other hand, in her State of the Union speech in 2023, Commission President Ursula von der Leyen announced the dialogues for the first time. Their aim is "to discuss with European industry and social partners how to strengthen and support the implementation of the European Green Deal, contributing to a reinforced industrial approach."[97] These dialogues can be seen as putting the actual work into implementing the rules outlined in the Green Deal.

Another result of enacting the Climate law was the introduction of the Fit for 55 package. It includes initiatives aimed at making Europe the first continent to achieve climate neutrality. It focuses on creating a competitive market and provides support for the transition outlined in the Green Deal.[98]

The Digital Product Passport was first introduced in 2022, when the Ecodesign for Sustainable Products Regulation proposal was adopted. It came into force on 18 July 2024. In the Regulation, it is stated that the European Commission should utilize existing database tools, e.g. European Product Registry for Energy Labelling,

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[93] European Commission, EU strategy for sustainable and circular textiles, 30 March 2022, available at: https://environment.ec.europa.eu/publications/textiles-strategy_en (02.04.2025)

[94] EUI, Florence School of Regulation, Emissions trading 2.0: The Social Climate Fund and Europe's just transition, 26 June 2023, available at: https://fsr.eui.eu/emissions-trading-2-0-the-social-climate-fund-and-europes-just-transition/ (02.04.2025)

[95] European Commission, The European Green Deal, available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/story-von-der-leyen-commission/european-green-deal_en (02.04.2025)

[96] European Commission, Before you apply: EU funding for beginners, available at: https://commission.europa.eu/funding-tenders/how-apply/you-apply-eu-funding-beginners_en (12.04.2025)

[97] European Commission, Commission takes stock of the Clean Transition Dialogues with EU industry and social partners, 10 April 2024, available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_24_1884 (02.04.2025)

[98] European Council, Council of the European Union, Fit for 55, available at: https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55/ (02.04.2025)

and integrate them with the DPP. Regarding technical specifications, the Regulation allows for unique rules and standards to be listed in the Official Journal of the European Union or as a common specification adopted by the Commission through implementing acts.[99]

In regards to data privacy and intellectual property rights, "…the digital product passport needs to be designed and implemented in a manner that allows differentiated access to the data in the digital product passport depending on the type of data and the typology of stakeholders."[100] In that way any sort of fraud will be terminated preventively. This will help prevent any potential fraud. However, all processing of personal data must comply with Regulation (EU) 2016/679 the European Parliament and of the Council of 27 April 2016 on the protection of natural persons regarding the processing of personal data and the free movement of such data, repealing Directive 95/46/EC (General Data Protection Regulation). To ensure transparency and easy access to product data, the European Commission will establish a DPP registry where all information will be stored.[101] This registry is yet to be set up.

As stipulated in Decision No 768/2008/EC, Article 1 states: "When placing products on the Community market, economic operators shall, in relation to their respective roles in the supply chain, be responsible for the compliance of their products with all applicable legislation."[102] This means that all products subject to the Ecodesign for Sustainable Products Regulation by 2030 must adhere to the rules of the DPP. The Decision also outlines that for conformity assessment, public authorities, manufacturers or notified bodies may be set out to execute the above-mentioned assessment. In the case of the Ecodesign for Sustainable Products Regulation, these bodies must be notified to the Commission by Member State authorities. These notifying authorities must be impartial to fully carry out their purpose. In addition, "notifying authorities should be required to safeguard the confidentiality of the information they obtain, but should nonetheless be able to exchange information on notified bodies with national authorities, the notifying authorities of other Member States and the Commission to ensure consistency in the conformity assessment."[103]

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[99] Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC, OJ L, 2024/1781, (Regulation 2024/1781), recital 34-36

[100] *Ibid.,* recital 31

[101] *Ibid*., recital 34.

[102] Decision No 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC, OJ L 218, pp. 82–128.

[103] Regulation 2024/1781, *op. cit.,* recital 86.

## 7. CONCLUSION

The global pursuit of climate neutrality began in the previous century. While undeniable progress has been made, the current rate of change remains insufficient to address the pressing environmental challenges we face. The introduction of the DPP represents a significant step toward a more sustainable future and a vital instrument in the transition to a circular economy.

By enabling systematic tracking of products throughout their entire lifecycle, the DPP aims to provide accessible and transparent information to all stakeholders. Consumers will be empowered with knowledge about the environmental impact, composition, and recyclability of the products they purchase. Simultaneously, businesses and industries will gain insights necessary for enhancing product circularity and optimizing resource use in production and waste management processes. This will ultimately reduce the volume of waste and allow materials to reach their full potential through reuse and recycling.

An analysis of the textile sector as one of the most resource-intensive industries underscores the broader benefits of the DPP in promoting sustainability. Perhaps the most crucial conclusion is that environmental responsibility lies with all members of society. It extends from individual consumers making informed purchasing decisions to legislators and policymakers shaping regulatory frameworks. The transition to a climate-neutral economy requires a shared commitment across all levels of society, grounded in transparency, accountability, and cooperation.

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## DIGITALNA PUTOVNICA PROIZVODA: S POSEBNIM NAGLASKOM NA MODNU INDUSTRIJU

U radu se predstavlja koncept digitalne putovnice proizvoda (u daljnjem tekstu: DPP) te njezin razvoj i provedba, s posebnim naglaskom na tržište Europske unije. Koncept DPP-a razmatra se u širem kontekstu razvoja međunarodnih sporazuma o zaštiti okoliša, ciljeva održivosti i zajedničkih postignuća u zaštiti okoliša tijekom posljednjih desetljeća. Analizom tih okvira rad pruža uvid u to kako se DPP uklapa u globalne napore usmjerene na stvaranje transparentnijeg, kružnog i održivog gospodarstva. Nadalje, rad stavlja poseban naglasak na tekstilnu industriju, njezin razvoj i utjecaj na okoliš. Tekstilna industrija detaljno se analizira zbog svojeg razvoja, brzog rasta, složenog proizvodnog sustava i ekološkog otiska. U toj se analizi raspravlja o tome kako bi uvođenje DPP-a moglo donijeti korjenite promjene u načinu na koji se tekstil proizvodi, upotrebljava i zbrinjava u Europskoj uniji i izvan nje. Osim toga, u radu se objašnjava jedan od najvećih problema s kojima se društvo suočava zbog prekomjerne količine otpada i njegovih posljedica, kao i „brza moda" (engl. fast fashion) kao glavni uzrok golemih količina otpada na planetu. Konačno, rad se bavi pravnim aktom kojim se uvodi digitalna putovnica proizvoda, odnosno Uredbom o ekološkom dizajnu za održive proizvode. Rad sadržava i dublji uvid u CIRPASS, projekt koji je postavio temelje za uspostavu digitalne putovnice proizvoda. U završnom dijelu rada razmatraju se pozitivni ishodi te inicijative, modaliteti njezine primjene u praksi i način provedbe.

**Ključne riječi:** *EU, tekstilna industrija, održivo gospodarstvo, kružno gospodarstvo, gospodarenje otpadom*

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