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CIRCULAR ECONOMY AND SUSTAINABILITY POLICIES IN THE EUROPEAN UNION: FROM THEORY TO PRACTICE[1]

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ABSTRACT

The "take-make-dispose" approach followed by the linear economy model has caused damage across social, environmental, and economic domains, revealing the necessity of adopting a new production and consumption paradigm. In the past, steps taken with a sole focus on profit and growth, without considering the limited of natural resources, have led to irreversible negative consequences that we face today. In response, countries aiming to act with greater consideration for the resources of future generations have adopted new strategic approaches such as the circular economy model, sustainable production, sustainable consumption, sustainable development, and zero-waste living. These concepts have frequently been addressed as part of this transition. In line with these approaches, the concepts of circular economy and sustainability -two of the world's emerging trends- have been discussed both nationally and internationally since the last quarter of the 20th century, and have gained increased theoretical and practical focus since the beginning of the 21st century. The transition from a linear to a circular economy represents a shift from a traditional to a new economic, social, and environmental paradigm. While this transition presents opportunities such as increased efficiency, waste reduction, the emergence of substitute resources, and new employment areas, it also brings challenges such as high costs, inter-country inequalities, and the long process of building societal awareness. In this article, the theoretical foundations of the circular economy model, which is an alternative to the traditional linear economy in order to ensure sustainability, and the global action plans signed by the European Union are examined, and the textile sector, one of the circular economy applications, is discussed.

Keywords: Sustainable Development; Circular Economy; Linear Economy; European Union; Textile Sector
JEL Clasifications: Q01, Q53, Q20, Q44, Q56

1. INTRODUCTION

Humankind lived in harmony with nature and caused minimal harm to it until it switched to agricultural production. With the beginning of agricultural production, settled life was started and the population increased. In order to feed the population, agricultural production was intensified, laying the foundation for irreversible damage to nature such as deforestation,

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desertification and soil loss (Yeni, 2014: 193) With the Industrial Revolution, which is the transition from hand production to mass production, a new era began in which the linear economy model system (take-make-dispose) was used. With industrialization, the inefficient use of production resources and environmental pollution caused by increasing wastes have become visible and countries have started to work on a new model (Önder, 2018: 198). The process and the activities carried out in the process clearly show that sustainable development is not possible with a consumption-oriented approach such as the linear economy model, and a circular economy model is needed for sustainable development (Türkmen et al., 2020: 2539). In response to this need, actors such as governments, academics, business leaders, civil and community organizations have come together to create a sustainable production and consumption system (Scoones, 2007: 589).

2. THEORETICAL BACKGROUND: FROM LINEAR ECONOMY TO CIRCULAR ECONOMY

With the Industrial Revolution, which laid the foundations of the linear economic model (take-make-dispose), mass production was started, and natural resources and energy were treated as if they were unlimited. As a result, industrialized countries grew economically, and their populations increased. However, the unidirectionality of the linear economy model and the inevitability of leaving 'waste' in the environment, which pollutes the nature and is the basis of global problems, is obvious (Ellen MacArthur Foundation, 2023). In the formation of the theoretical infrastructure of the linear economy model, the idea of "*laissez faire laissez passer*" advocated by classical economics supported unlimited production, while Say's Law's "*Every supply creates its own demand*" led to increased consumption (Aytaç et al., 2022: 6).

The linear economy model has brought environmental pollution not only in terms of production but also in terms of both production and consumption (Önder, 2018: 197). In the 1960s, environmental problems became visible, and the concept of sustainability emerged, and in the 1970s, national and international steps were taken in the name of circular economy (Yılmaz, 2019: 61).

2.1 Circular Economy: Concept and System

The name of the sustainability-based economic paradigm, which is considered as an alternative to prevent irreversible damages caused by the linear economy and to ensure the welfare of future generations, is the circular economy model. Crutzen considered the Anthropocene Period as the beginning of the industrial revolution (Steffen et al., 2015: 2). After the 1950's, the Anthropocene Epoch defined by Crutzen was entered, and studies have been started since the 1960's in order to provide the welfare of other members of the system as a part of the ecosystem, and to prevent the damages caused by the Anthropocene Epoch.The circular economy model presented as a solution is inspired by nature. Because "*nature does not produce waste*" (Gültekin et al., 2019: 538).

There is no single definition of the concept of circular economy. The two most commonly used definitions are given below:

According to the European Union, circular economy is defined as: rejecting the linear economy, regenerative; going through processes that repair, renew or revitalize its own energy and material resources and wasting as little as possible in these processes.

According to the Ellen MacArthur Foundation, a circular economy is a model in which materials do not become waste, but are instead kept in the system through processes such as maintenance, renewal, repair, recycling and remanufacturing. This model is about tackling global challenges such as climate change, biodiversity at risk and pollution. Three main principles govern the circular economy (McKinsey Company, 2016: 5):

1) controlling limited stocks and balancing the processes of resources in order to conserve natural capital and maximize its potential.

2) Ensuring that resource efficiency is kept at the highest level by keeping the products and materials in use in the cycle with the highest added value.

3) Eliminating negative externalities to make the system more efficient.

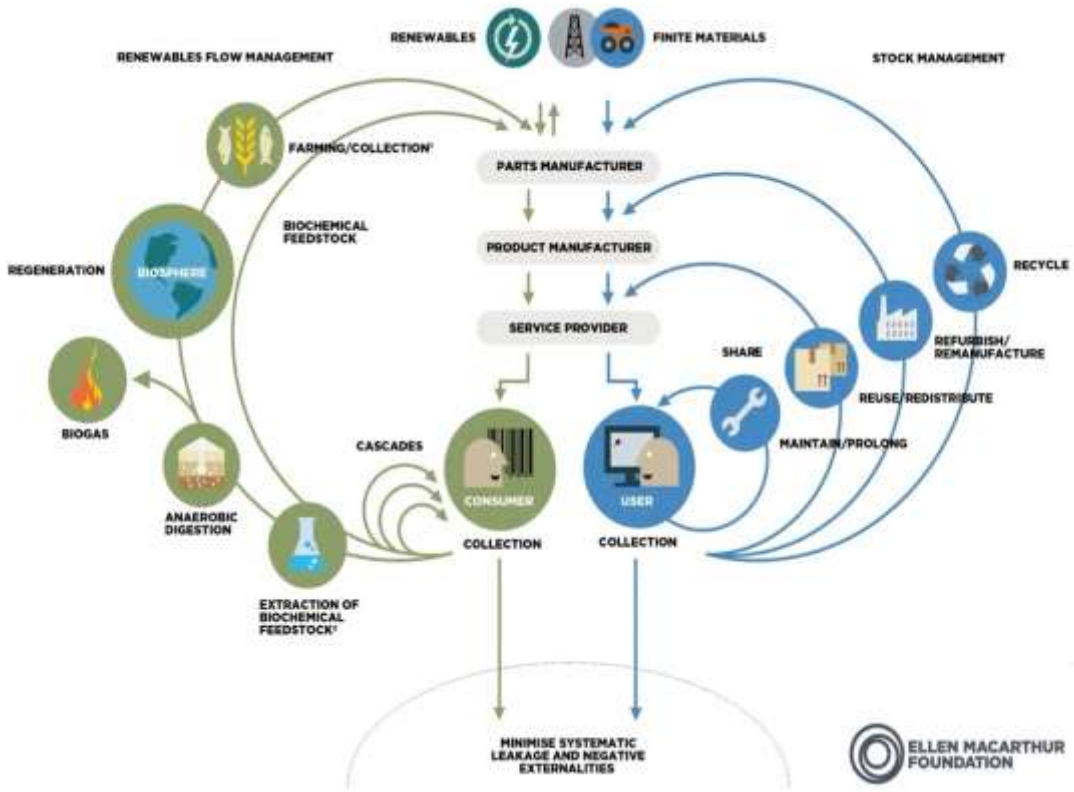

Figure 1: The Butterfly Diagram
Source: (Ellen Macarthur Foundation (https://www.ellenmacarthurfoundation.org))

The Ellen MacArthur Foundation uses a butterfly diagram to describe the system. Its interpretation of the diagram is as follows: the diagram has two wings: The right wing talks about the steps in the technical process to keep products and materials in circulation, such as repair, maintenance, reuse and recycling, while the left wing talks about the biological process of returning products and materials back to the earth in the form of raw materials. "*There is no waste in nature, waste is a human inventio"* (Ellen MacArthur Foundation, 2021).

2.2 Comparison Between Linear and Circular Models

The traditional and still in use linear economy model refers to a system of buy-make-use-dispose. This system is one-way, with a focus on profit and production rather than on the efficiency or sustainability of the use of natural resources, energy and fossil fuel consumption. The waste generated as a result of this process is a burden on the world. The circular economy system is based on sustainability. Arrows constantly renew themselves and aim to return to the world as raw materials or reusable products or materials. Waste is accepted as raw material for a new system or kept in the loop with other strategies (Balbay et al., 2021: 558).

The linear economy model expresses short-term production and consumption. Situations that threaten our common future such as increasing consumption with increasing population, decreasing welfare, depletion of resources and climate crisis clearly show that the current system cannot meet the needs of society (Veral, 2021: 8). With the circular economy model, it is aimed to meet the needs of today's and future society with a holistic process that refers to efficiency-based clean production, where waste is reintroduced to the world.

2.3 Sustainability

Since the concept of sustainability is multidimensional, it appears in different sciences with definitions unique to science (Yeni, 2014: 183). Sustainability is a dynamic concept, in general, it is a system that has the ability to "preserve", "protect", "continue its existence", "self-sustainability" (Şen et al., 2018: 5). The negative effects of the linear economy model have brought the issue of sustainability to the agenda. Discussions on sustainability have revealed that sustainability should be addressed with its social, ecological and economic aspects (Yaylı, 2015: 934). In this direction, it aims to maintain the functionality and flexibility of the branches to which it is linked and to ensure a balanced progress of the system (Gedik, 2020: 206). Sustainability, which focuses on the environmental consequences of actions taken in the economic sense, is based on renewal and thus not depleting resources, also ensures economic development.

2.4 Sustainable Development

Sustainable development is achieved through the combination of development and sustainability (Gedik, 2020: 197). The concept of 'sustainable development' was first mentioned in the "Brutland Report". In the report, sustainable development is defined as: "*Development that meets today's needs without compromising the ability of future generations to meet their*

needs" (Ministry of Foreign Affairs of the Republic of Türkiye). In order to achieve sustainable development, it is necessary to change production and consumption processes by moving away from the current system (Circle Economy). Circular economy supports sustainability and sustainable development (Circle Economy). The common goal of countries is to achieve sustainable growth and development in social, economic, and environmental areas through production and consumption in a way that protects resources and increases welfare.

3. CIRCULAR ECONOMY POLICY: EUROPEAN UNION (EU) AND TÜRKİYE

The concepts of "sustainability", "sustainable development", "circularity" and "circular economy" have come to the agenda of countries as a result of the climate crisis, the consumption of natural resources through inefficient production and the risk to biodiversity. In the world and in Türkiye, the public sector needs to take a regulatory and supervisory role in order for the steps to be taken effectively to ensure sustainable development through circular economy (Koç, 2024: 99). In this section of the study, the policies implemented by the European Union and Türkiye within the scope of circular economy are mentioned.

3.1 European Union Circular Economy Policies

The European Union aims to make Europe cleaner and more competitive through the transition to a circular economy. It envisages that this transition will not only create sustainable growth and new job opportunities and jobs, but also reduce pressure and pollution on natural resources, achieve climate neutrality and prevent biodiversity from being at risk (European Commission, https://european-union.europa.eu).

Preventing waste from occurring and ensuring the utilization of the part that cannot be prevented is the prioritized goal for waste management and adaptation to the circular economy model (Mısır et al., 2022: 70). The European Union's policy development process on waste management dates back to the early 1970's. In addition, in terms of environmental policies, waste management is the first area of revision. It has developed concepts and policies such as "*polluter pays*", "*priority waste types*" and "*waste hierarchy*" for actions such as ensuring maximum efficiency at source and reducing the amount of waste and packaging (Veral et al., 2018: 3).

Supporting the transition to the new model, the European Commission adopted the First Circular Economy Action Plan in 2015. Legislative amendments for waste management were addressed under this plan (Mısır et al., 2020: 71). The plan, which included four legislative acts and fifty-four actions, was implemented until 2019 and was recognized as a pioneer in circular economy policy making (Ellen Macarthur Foundation, 2022). In 2019, it was observed that most of the objectives of the plan set in 2015 were realized. In order to ensure the sustainability of this situation, a new plan with 35 actions was created in 2020 (Yılmaz, 2020: 98).

The action plan, which aims to create sustainable product policy, less waste, and new employment opportunities, aims to create economic growth and a competitive economic system

without using resources (Küçük et al., 2021: 144). The European Green Deal, which forms the basis of the new action plan, was announced in December 2019. The European Green Deal, which sets a target until 2050 and is based on the European Union's strategy for a sustainable future, includes issues such as climate, energy and financing, as well as the fight against pollution such as the 'Zero Pollution Action Plan' (European Commission, https://european-union.europa.eu).

The Carbon Border Adjustment Mechanism (CBAM), organized within the scope of the Emissions Trading System to reduce greenhouse gas emissions, which is one of the priority targets of the European Green Deal, was published on 16 May 2023 with its basic outlines and laws (Republic of Türkiye Ministry of Foreign Affairs Directorate for EU Affairs, 2024). Continuing with the system that does not focus on climate policies, the European Union for the risk of "carbon leakage"; to put a fair price on goods with intense carbon in their production, to encourage non-EU countries to clean, green and carbon-free industrial production, to ensure that the embedded carbon price in imported goods is equivalent to the domestic production carbon price, the transition period in the CBAM step was accepted as 2023-2025 and the final regime was determined as 2026. The phased transition focuses primarily on cement, iron and steel, aluminum, fertilizer, electricity and hydrogen, which are the most carbon-intensive commodities produced by countries. All stakeholders are encouraged to focus on learning and improvement in this process. Moving in this direction, the emissions trading system is expected to reach more than 50% of the emissions of the sectors covered. As of January 1, 2025, a portal has been opened for operators wishing to obtain CBAM registration. The status of 'authorized CBAM declarant' will be mandatory for CBAM goods in the customs territory of the European Union from 2026. (European Commission, 2025).

The European Union's revisions in political and trade integration for the green economy while combating the climate crisis will also affect the policies of other countries (Küçük et al., 2021: 150).

3.2 Türkiye's Circular Economy Policies and Adaptation Process

Türkiye has made changes and regulations in many regulations to realize its circular economy target (Koç, 2024: 100). The primary goal of the European Green Deal, the European Union's new growth strategy, is to use clean energy that will not pollute the atmosphere. It is to ensure the use of energy generated by electricity instead of energy used by burning fossil fuels. The whole process should be green and clean (Kurnaz et al., 2024: 49). The agreement aims to prevent the climate crisis with climate-neutrality by 2050, to regulate carbon emissions to ensure production that will reduce costs and protect competition, to ensure that the circular economy is all over the world in a sustainable way, and to ensure that member states are in a competitive environment. It is a guide for countries with both economic and trade relations. The agreement enables other third world countries to adapt to the European Union and remain competitive. Türkiye, as one of the countries with a customs union partnership, should continue its policy and implementation efforts to maintain and increase its competitiveness (Ecer et al.,

2021: 132-135). 2053 has been set as a net zero carbon emission year (Aydınoğlu et al., 2022: 109). Within the scope of the Green Deal, the Ministry of Trade of the Republic of Türkiye published the Green Deal Action Plan in 2021, which includes 9 main topics, 32 targets and 81 actions. The 9 main topics are as follows (Green Deal Action Plan, 2021: 10):

1) Carbon regulation at the border
2) green and circular economy
3) green financing
4) clean, affordable, and secure energy supply
5) sustainable agriculture
6) sustainable smart transportation,
7) tackling climate change,
8) diplomacy and
9) European Green Deal information and awareness raising activities.

At the same time, a 'Green Deal Working Group' was established, and the Working Group publishes its annual activity reports on the website of the Ministry of Trade (Republic of Türkiye, Ministry of Trade, 2023). In addition to these efforts, Türkiye is a signatory to the Kyoto Protocol (1997), the Paris Agreement (2016) and the United Nations Framework Convention on Climate Change (1994) (Koç, 2024: 93). In terms of waste management, which is one of the issues that the European Union is working on, Türkiye provides information and current practices on zero waste on the Zero Waste page, which is handled as a separate site by the Ministry of Environment, Urbanization and Climate Change of the Republic of Türkiye, in order to raise awareness and raise public awareness. At the same time, the statement made by the Ministry of Foreign Affairs of the Republic of Türkiye mentions the availability of funding opportunities in the steps taken for green transformation (Ministry of Foreign Affairs of the Republic of Türkiye, 2024).

4. CIRCULAR ECONOMY APPLICATION EXAMPLE: TEXTILE

The transition from a linear to a circular economy model requires a fundamental economic and social transformation, not an environmental one. Industry is also a priority area that needs to be prioritized for the realization of the circular economy model in terms of production and consumption. The textile sector, which is an important branch of industry, is also one of the strategies of the European Union to realize the European Green Deal. Because the European Union textile sector production, third in water and land use, and fifth in the use of primary raw materials and greenhouse gas emissions. Textile consumption has the fourth highest impact on climate and environmental change. The top three are food, housing and human mobility. Aiming for 2030, the European Union wants a sector that is greener, more competitive and resilient to global shocks. A few of the actions it has identified for the strategy are listed below (European Commission, 2025):

- Designing products that last longer, are repairable and easy to recycle,
- Raising awareness of overproduction and consumption and avoiding the disposal of returned or unsold products,
- Raising awareness about sustainable fashion,

- Restricting the export of textile waste,
- Promoting sustainable textiles,
- Fomentation for transition to circular business models.

Recently, the "fast fashion" approach in textiles has become widespread and the use of non-recyclable clothes made of cheap materials that will be worn for only one season or less has increased. With the circular business model and circular product design, it is aimed to increase the value of textile products, to keep the products in the life cycle and to ensure the use of recycled materials in production. Policies in these processes require revisions in technical and social areas as well as business innovation (European Environment Agency, 2025). In a scenario where natural resources and human capital cannot be substituted, it is not possible to increase consumption and ensure prosperity if technological progress cannot be achieved (Yeni, 2014: 189). In the circular economy model, the letter "R" includes all of the targeted process steps from source to product use, and there are multiple actions for each letter R. At first, it was put forward as 3R principles, and then it was increased to 6R (Gedik, 2020: 26). Today, its final form appears as the 9R principle.

Table 1. Actions for increased circularity within the product chain

BEFORE USE	REFUSE	Consider the necessity to acquire an additional product
	RETHINK	Design for longer lifetimes, repair and recycling or provide the function without making an additional product
	REDUCE	Produce the product with minimal environmental impact
DURING USE	RETAIN	Use and maintain existing products for a long service life
	REUSE AND SHARE	Provide products to others for further usage
	REPAIR	Fix defective products and return them to original functionality
	REMANUFACTURE	Rebuild products to deliver as-new, or upgraded, functionality
AFTER USE	RECYCLE	Process discarded products into useful, high-quality materials
	RETURN	Substitute virgin resources with secondary raw materials

Source: (European Environment Agency, 2024)

Countries that want sustainability and green economy also include the textile sector, where natural resources, energy and water are used intensively, in their action plans (Üstün, 2021:339). In this part of the article, R principles and practices in the European Union and Türkiye are examined.

4.1 Recycle and Reduce

Waste should be avoided in the textile sector. Because almost 100% of products are recyclable. Recycling has positive effects such as avoiding the cost of inadequate landfill capacities with increasing consumption, providing employment for workers and transporting clothes to charities or disaster areas in need (Wang, 2006: 10-14). There are two approaches to textile recycling. The first is the use of the product in its original form, and the second is the recovery of textile or production waste by chemical or mechanical methods. Textile wastes can be recycled as raw materials in the production of other materials such as plastic production, yarn production, and fiber production (Altun, 2014: 24). There are 500 companies in the USA and more than 300 companies in Germany that recycle textile wastes (Türemen et al., 2018: 807). France, one of the European countries, aims to achieve 95% reuse by collecting wastes with the Circular Textile Exchange. Belgium, on the other hand, continues to be one of the leading recycling centers in Europe as well as being considered the best example in legislation and practice. When we consider Türkiye, most of the companies acting for recycling purposes are located in Istanbul. However, Uşak is the center that provides 72% of textile recycling. While 2,720 liters of water is consumed for 1 t-shirt with primary raw materials, 1 t-shirt can be obtained from 6 plastic bottles with recycling (Textile Industry Employers' Union of Türkiye, 2022). While voluntary individuals and non-profit organizations make a small contribution to recycling with the management of delivery to those in need; today, clothing brands raise awareness by making this a campaign. In this way, when we consider it from a micro and macro perspective:

o for individuals: designed products are more durable and longer lasting, reducing cost and consumption,
o for companies: increasing efficiency by reducing the use of resources such as raw materials, water and energy through recycling,
o for countries: it is obvious that there are benefits such as avoiding waste costs and avoiding pollution to the environment in waste disposal.

4.2 Reuse

The 20th century “fast fashion” approach is based on the perception that clothes are disposable (Ellen MacArthur Foundation, 2017). This understanding, which is not a sustainable business model, covers a wide market. The alternative offered to prevent the environmental damage caused by fast fashion is “slow fashion” and was first used by Fletcher in 2007. It is a system based on long-term thinking and quality (Mangır, 2016: 150-151).

In the textile sector, second-hand consumption for sustainability plays an important role in reuse and reducing textile waste (İşçioğlu et al., 2018: 253). While second-hand markets functioned in the past, they lost their functioning with the production of quality and cheap goods Industrial Revolution (Yıldırım, 2017: 489). Today, phenomena such as the endangerment of primary resources, increasing costs and consumption frenzy show that these markets should be on the agenda. In European countries, many clothing brands include clothing donation boxes; they have areas for this purpose in their stores in order to deliver them to those in need or to use them as raw materials. In addition, with the development of technology, online second-hand platforms have become widespread, and it is seen that luxury clothing products are also sold by offering a guarantee of authenticity.

Another method is leasing or borrowing. It is waste again, but its life in the cycle is extended (Yücel et al., 2018: 376). The use of second-hand products will not only reduce the use of inputs required for new production but will also contribute to reducing the amount of waste disposed of in the environment. In the days of increasing digitalization, the use of second-hand platforms should be handled not only economically but also with its environmental and social dimension and the society should be raised awareness.

5. CONCLUSION

The environmental damage caused by the take-make-dispose approach since the Industrial Revolution is no longer negligible with economic growth. Countries have started to work on transition strategies to the circular economy model, which is an alternative approach to ensure sustainable economy and development without destroying the resources of future generations. It is a mistake to think of this issue only as recycling. Circular economy is a system. Recycling is a part of the circular economy system, not the whole of it (Kurnaz et al., 2024: 5).

One of the priority sectors for this approach, which requires structural change in all areas, is textiles. Dressing is one of the basic rights such as food, housing and human mobility. In economic terms, the increasing demand in textile consumption has caused and continues to cause inefficient use of resources. The European Union produces 5.8 million tons of textile waste every year and these wastes are disposed of by incineration (European Commission, 2022: 1). Lack of efficiency in the energy, water and manpower used in textiles and the understanding of 'fast fashion' make waste inevitable. Although recycling and reuse in textiles have been practiced since the past, the “slow fashion” understanding should be imposed on the society by implementing the r qualities such as repair, entering the cycle as primary raw material by the countries. Despite the cheapness of the traditional production approach, the production of high quality, durable and recyclable products will be more costly. In the transition to a circular economy, individuals and companies will need financial support and incentive systems (Koç, 2024: 112).

The European Union has signed global agreements with other countries for sustainable development, a global, competitive, flexible and circular economy and a green Europe. Türkiye is among the countries signing and implementing policies for these goals. The 2015 circular

economy action plan is one of the successful examples in this field. In order to ensure the sustainability of this success, a new circular economy action plan was established in 2020. The plan, which covers the years 2020-2030, consists of 35 actions with objectives such as the production of sustainable products, less waste emission by focusing on sectors with more primary resources and circulation, and raising global awareness (European Commission, https://european-union.europa.eu).

Another important agreement for the European Union and Türkiye is the European Green Deal. Since Türkiye is a Customs Union Agreement country, it is particularly interested in legislation and practices in this area in order to adapt to the competitive system and strengthen its relationship with the European Union. As global environmental pressures intensify, the shift to circular economic systems is no longer optional but essential. Both conceptual clarity and policy coherence are critical to this transformation.

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