THE ROLE OF SUSTAINABLE PUBLIC PROCUREMENTS IN THE TRANSITION PROCESS FROM THE LINEAR ECONOMY MODEL TO THE CIRCULAR ECONOMY MODEL

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Abstract: *Sustainability issues are addressed extensively in current researches. Nonetheless, the authors consider it necessary to deepen studies on the role of public procurement in the transition from the linear economy model to the circular economy model. The authors also consider that there is a close link between sustainable acquisitions and the development of the sustainable financial market. This is demonstrated by the evolution of exponential growth in both the volume of sustainable debt securities and investments in sustainable assets. For the elaboration of this study, the authors applied the monographic method to establish value judgments regarding the approached concepts, the comparative method to highlight particularities of the different approaches of the concept of public procurement in terms of sustainability aspects. To determine the trend in 2012-2019 of sustainable debt securities, the authors applied the time series adjustment method according to the power function and the average growth rate method.*
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INTRODUCTION

In the last three decades, the Republic of Moldova has faced important environmental and social challenges: degrading of agricultural land, water pollution,

irrational waste storage, mass migration of young people in the country, aging population, etc. These challenges are also inherent in other states, with a developing economy and, as well as, with a developed economy.

Awareness of the dimensions of social, economic and environmental sustainability has increased in the last two decades. In order to promote economic and societal sustainability, the Group of the Progressive Alliance of Socialists and Democrats in the European Parliament (S&D Group) launched in January 2018 the Progressive Society Initiative (Progresive Society, 2018), which is based on the UN Sustainable Development Goals for 2030, adopted in 2015 at the Summit of 25-27 September 2015 (European Commission, 2015) The 17 Global Sustainable Development Goals and 169 specific objectives address three dimensions of this development: social, economic and environmental (eradicating poverty, combating inequality and injustice; protecting the environment), (United Nation, 2020). Through its initiative, the S&D Group set out to adopt a set of measures „…to change the course of Europe", so that „…a very different society can be born - a society of sustainable equality, wellbeing for all, economic balance, social and ecological and peace - which leaves no one and no region behind". To ensure „sustainable equality" in the EU, the S&D Group comes with a series of recommendations, which also refer to „changing production and consumption patterns to make them widely sustainable" (Progressive Society, 2018: 171).

„Sustainable development is the only way forward" (UNDP Moldova, 2017: 41). In this context, the Republic of Moldova, along with 192 other UN member states, has committed itself to aligning with the 17 objectives of the 2030 Agenda by „integrating the objectives into the process of planning and developing public policy documents at all levels, in order to make the operational agenda" (UNDP Moldova, 2017: 9).

The path of sustainable development can be followed by:

- integration of sustainable principles into the public procurement system,
- sustainable investments,
- promoting the circular economy model, etc.

The integration of the principles of sustainability in the public procurement system is addressed extensively in both national, European (European Commission, 2017, Farid Y., 2019) and international public policy documents, as well as in studies conducted by numerous scientists (Farid Y., 2017; Heshmati, A., 2017; Adjei A.B., 2010). There is a consensus on the role of sustainable public procurement in future generations. However, there are some divergences that relate to the terminology used. These issues will be addressed in more depth in the following.

CONCEPTUAL APPROACHES TO PUBLIC PRIVATE PROCUREMENTS IN TERMS OF THE SUSTAINABILITY COMPONENT

The research that was carried out highlights several concepts: green procurement, economic procurement, durable procurement, sustainable procurement, circular procurement. A summary of their definition is presented in Table 1. The implementation of sustainable public procurement in the Republic of Moldova began in 2017. However, the Guide on Sustainable Public Procurement of the Public Procurement Agency of the Ministry of Finance of the Republic of Moldova (Public Procurement Agency, 2017)

contains mostly references to green procurement, while the social and economic aspects of sustainable purchases are not properly reflected.

Currently, the criteria most often invoked by contracting authorities is the "lowest price", but in the conditions of implementing sustainable procurement the priority will be given to the criteria "lowest lifecycle cost" of the product (Adjei A.B., 2010).

Table 1. Definitions of the concepts of public procurement approached through the prism of sustainability components

Concept	Definition
Green procurement	These are a process by which economic entities and / or public authorities procure goods, services and works with a low impact on the environment during their life cycle compared to goods, services and works with the same primary function, which would be otherwise purchased. (COM, 2008) Green procurement is adopting environmentally responsible practices in business used to meet the needs for materials, goods, facilities and services. (European Union, 2016: 4)
Sustainable (durable) procurement	Sustainable procurement is a process by which economic entities and / or public authorities meet their needs for goods, services, works and utilities in a way that achieves „value for money for life" in terms of generating benefits not only for organization, but also for society and the economy, while minimizing and avoiding, environmental damage. (Public Procurement Agency, 2017)
Circular procurement	Circular procurement integrates an approach to green public procurement, which pays special attention to „the procurement of works, goods or services that tend to contribute to closing the loop in supply chains with energy and material resources, while reducing and at best case, avoiding the negative impact on the environment and the formation of waste during the whole life cycle". (European Commission, 2017)

Source: developed by authors

The costs of using products purchased at a lower price, but without ESG considerations (ESG - environmental, social and governance) are higher than the costs of capitalization on an organic product (Fig. 1).

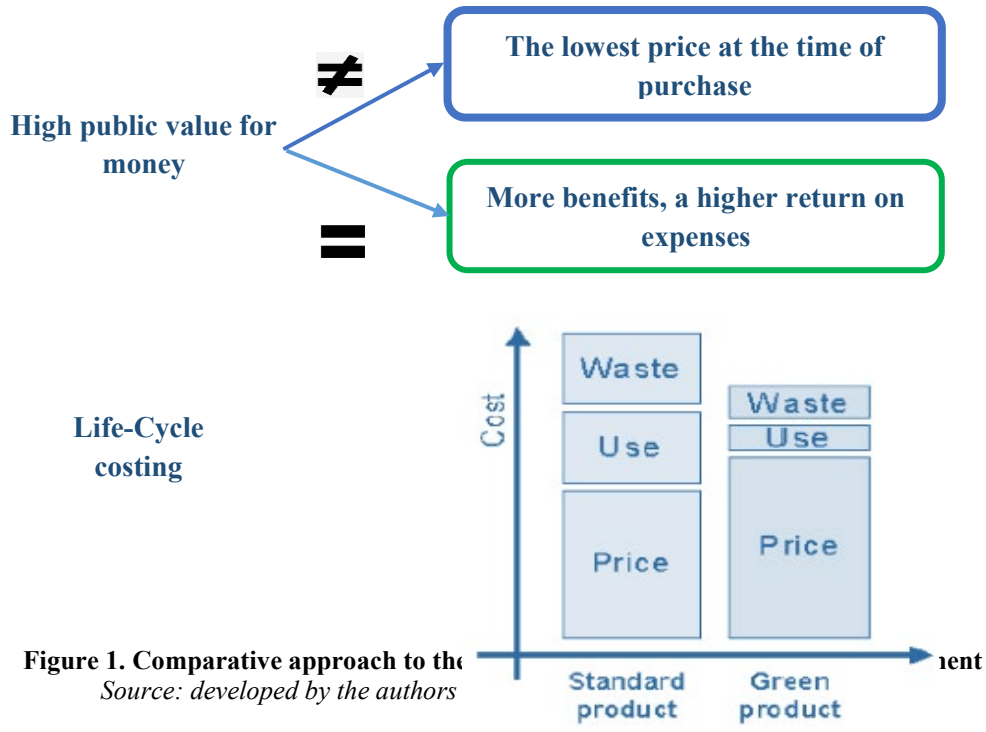

Figure 1. Comparative approach to the ıent
Source: developed by the authors

The integration of sustainability principles into the public procurement system must be achieved gradually. A prioritization model of the action set would be the European model of the public procurement hierarchy is presented by the authors in Table 2, which is based on sustainable waste management, in the following sequence: (Figure 2):

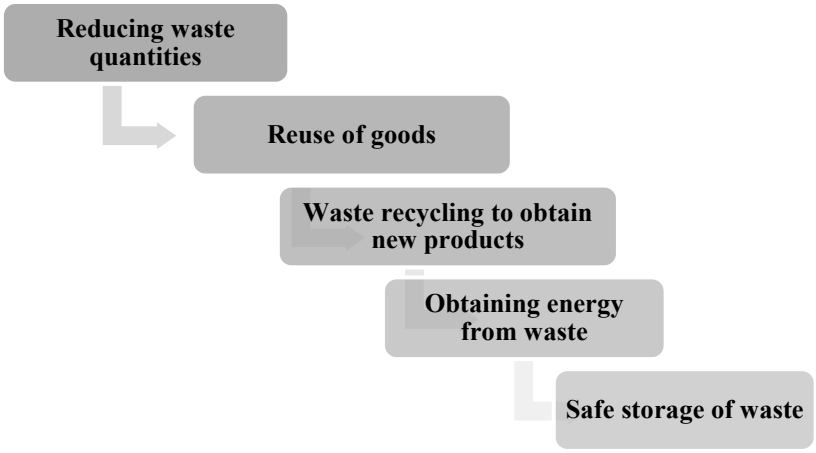

Figure 2. Waste hierarchy.
Source: (Cole, C. et all., 2014).

Table 2. Transition to a public procurement system based on the European model of the waste hierarchy

Stage	Specification
Stage I. ***Quantitative reduction of waste.***	A first step in this direction is possible by promoting sustainable consumption, the purchases made must be necessary, so as not to generate much waste. For example, procurement contracts may contain restrictions on the packaging of products, so that packaging is minimal.
Stage II. ***Reuse.***	More and more companies have adopted sustainability policies, so more and more products are designed to be reused. This can be a condition when designing the offer. Such practices have already become common in the purchase of ICT equipment (laptops, desktops and others can be reused by other organizations and institutions.)
Stage III. ***Recycling.***	Some products cannot be reused, therefore, they must be designed in such a way that there will be a possibility to recycle them. These products include those that are made from recyclable materials or they contain material that can be easily and efficiently recycled into another good.
Stage IV. ***Recovery.***	Waste recovery involves the recovery and capitalization of waste for various purposes. For example, obtaining organic fertilizers by composting food waste or converting used alimentary oil or animal fats into biodiesel.

Source: Elaborated by the authors based on the source (EU Waste Framework Directive, 2008).

Of course, circular purchases can be considered the most environmentally friendly. Public authorities can contribute to the promotion of circular procurement by formulating specifications and contract award criteria. Since October 2017, the European Commission has developed GPP criteria for about 20 groups of goods. An increased emphasis on circularity is placed on buildings, computers, textiles and furniture (European Commission, 2017: 4-7). If for computers, furniture, there are put forward the requirements for reuse, in case of textiles - for recycling, then for buildings there are put forward energy performance requirements, the emphasis being on reducing energy consumption or use of energy

resources from local renewable sources. The national energy targets of the Republic of Moldova for 2020 set in relation to the obligations assumed by accession to the Energy Community Treaty and the energy acquis of the European Union (Energy Strategy of Moldova until 2030, 2013) focus on two aspects: energy security and energy efficiency (Figure 3).

The main objective of the Republic of Moldova for the next 10 years (2030) will be to reduce greenhouse gas emissions, which will contribute to a new energy mix and improve energy efficiency.

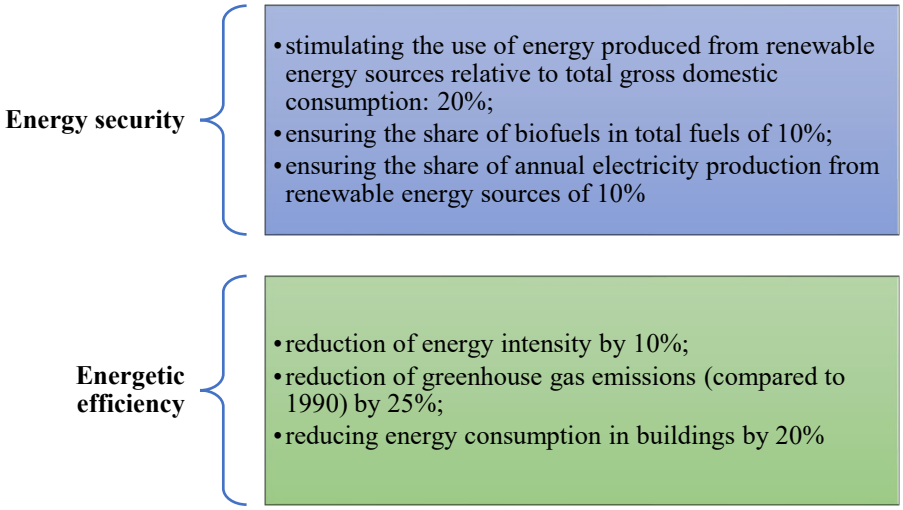

Figure 3. Sustainable targets on energy security and efficiency of the Republic of Moldova for 2020
Source: Elaborated by the authors based on the Energy Strategy of the Republic of Moldova until 2030 (Energy Strategy of Moldova until 2030, 2013)

SUSTAINABLE PROCUREMENT - A DETERMINING FACTOR IN THE PROCESS OF TRANSITION TO THE CIRCULAR ECONOMY MODEL

At the heart of the concept of sustainable procurement and circular procurement is the model of the circular economy - a concept that is under continuous debate. Concerns about a new approach to production and consumption patterns have been emerging since the 1970s. China is one of the first countries to integrate the principles of the circular economy into national law. In the 1976 Report „The Potential for Substituting Manpower for Energy", researchers at Battelle Instituite Geneva Walter Stahel and Genevieve Reday brought to the attention of the European Commission the concept of the circular economy, on its impact on job creation, economic competitiveness, resource saving and waste prevention. In addition to the concept of circular economy, they promote another concept: "functional services economy" or „performance economy" (Geneviève R.-M. and Walter R. S., 1977). It should be noted, therefore, that the circular economy ultimately defines a waste management model that began with efficiency goals and is moving towards a new horizon – Zero Waste. The concept of the circular economy was also used by Pearce and Turner in the book Economics of Natural Resources and the Environment published in 1990 (Pearce, D.W. and Turner, R.K., 1991). A study by a group of researchers (Kirchherr,

J. et al.,2017: 221-232) found that "circular economy" is a concept approached in different ways, a study that allowed the authors to identify 114 definitions from 100 scientific articles published in 2016 and about 30 published in 2014. The Ellen MacArthur Foundation defines the circular economy as „a generic term used for an industrial economy" (Ellen MacArthur Foundation., 2013), which is created for the purpose of being restorative and in which the material cycle consists of:

1) the *biological cycle*, where the processes act in such a way that the components re-enter the biosphere without negative effects;
2) the *technical cycle*, where the components are used very efficiently and do not enter the biosphere.

The circular economy is based on the 3R principles in waste management: reduction, reuse and recycling. The stated principles represent a circular system in which all waste is recycled, all energy is derived from renewable sources; activities support and rebuild the ecosystem and support human health; healthy resources are used to generate high lasting value (Sadhan K. G., 2017).

In 2015, the European Commission launched the implementation of the circular economy model and declared "Closing the loop" - an EU action plan for the circular economy. The Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions set out the action plan "which will play a key role in achieving the Sustainable Development Goals (SDGs).) by 2030, in particular Objective 12 - to ensure sustainable consumption and production patterns" (Brussels, 2.12.2015). This action plan mentions the essential role of public procurement in the circular economy, giving them a significant share in European consumption, accounting for about 1/5 of EU GDP. The process of transition to the circular economy is taking place gradually. As an intermediate step is the economy of reuse.

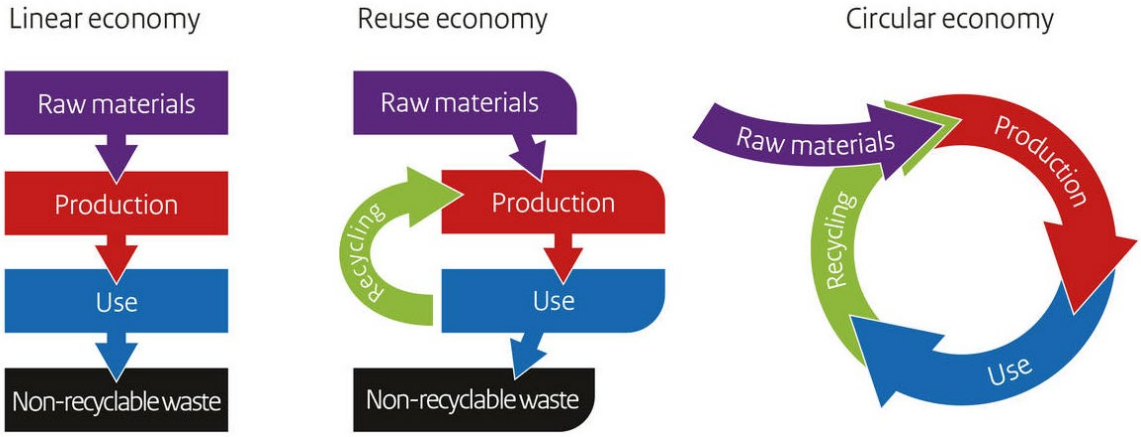

Figure 4. From linear to a circular economy.
Source: (Government of the Netherlands, 2017)

The circular approach to procurement offers multiple benefits. In addition to enabling buyers to focus on meeting needs and taking into account life-cycle costs with potential savings, circular procurement also provides a frame of reference for a more comprehensive analysis of environmental impact and waste generation. during the entire

life cycle of goods and services, which includes a series of stages. These stages are different in the case of the circular economy from those followed in the linear economy model. From fig. 4 shows that the linear economy model ends with waste storage, which seriously pollutes the environment, and circular business models aim to reduce this impact by capitalizing on them.

The Gartner report of September 26, 2019 Gartner Predicts Circular Economies Will Replace Linear Economies in 10 Years states that by 2029, the circular economy will replace the wasteful linear economy (Hippold, S., 2019). With the reorientation of consumer and shareholder preferences towards sustainable activities and products, CSCOs managing supply chain officers (CSCOs) must anticipate non-waste procurement strategies (Zero Waste).

The circular economy model is closely linked to sustainable investment. Also called responsible investments, they involve the incorporation of environmental, social and responsible governance factors when making investment decisions, rather than relying solely on financial considerations. The European Commission is negotiating with the management of the European Investment Bank on the subject of transforming the latter into the European Climate Bank. It is intended to make massive investments in circular economy and biodiversity projects. „Organic products will become the norm for citizens, but we will have to start with public authorities: ecological criteria for public procurement will become essential, so that public demand for similar products and services grows exponentially." (Ecopresa, 2020). Accomplishing these goals can be achieved by increasing the impact of public investment through sustainable procurement. In this context, in October 2017 The European Commission launched the initiative to „make procurement more efficient and sustainable" (European Commission, 2017).

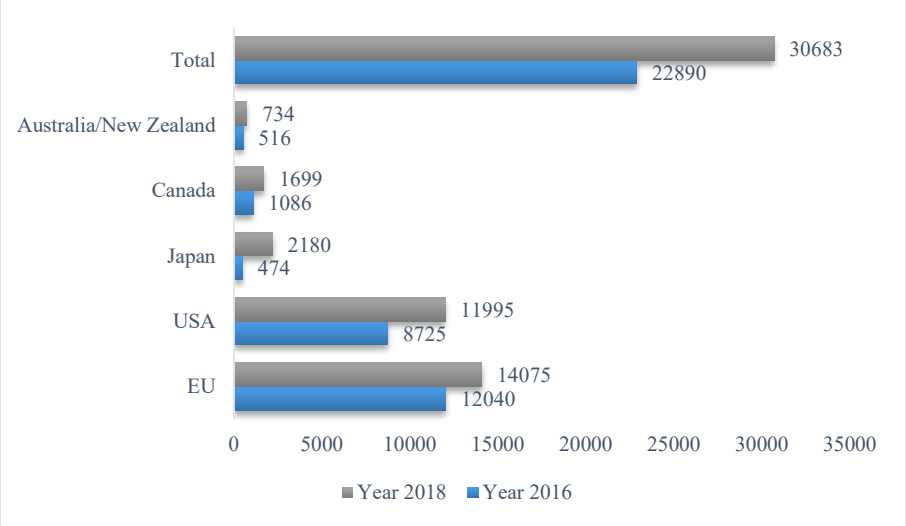

Figure 5. The value of investments in sustainable assets in regional and total aspect, 2016, 2018, billion. US dollars.

Source: developed by authors based on data taken from the source (Uzsoki D., 2020: 3)

Financial market participants are already aware of the extent of incorporating environmental, social and governance (ESG) considerations into investments. This is seen through the evolution of the amounts allocated in investment projects on ESG considerations in the regional aspect during three years (2016 - 2018). The largest increase

is in Japan, where the volume of investments in sustainable assets increased in 5.6 times. A modest increase (16.9%) was recorded during this period in the EU countries. In total, on the analyzed regions, the value of sustainable investments increased by about 34%. Along with the increasing trend of circular investments, there is also an increase in funding sources attracted by sustainable instruments. According to the Report presented by BloombergNEF experts at the Sustainable Bonds Forum in Washington in October 2019, the volume of sustainable debts issued at the end of 2019 was one trillion USD (Henze, V., 2019). About 77% (USD 788 billion) were made up of green bonds. The United States and China are at the forefront of sustainable financing through green bonds.

One of the recommendations of the S&D Group set out in the Progressive Society initiative (Progresive Society, 2018) also refers to public entities: „European financial institutions should lead by example both through a public issuance of green bonds and social bonds, aimed at financing new projects, and through providing initial guarantees to support concrete projects to reach a critical mass". In order to carry out these actions, the S&D Group recommends that the European Investment Bank support the 2030 Sustainable Development Goals and the activities for the implementation of the Paris Agreement on climate change.

At the same time, developing countries, such as the Republic of Moldova, have not put into circulation sustainable debt instruments issued by public authorities or corporate entities, despite the trend of increasing their volume in developed financial markets.

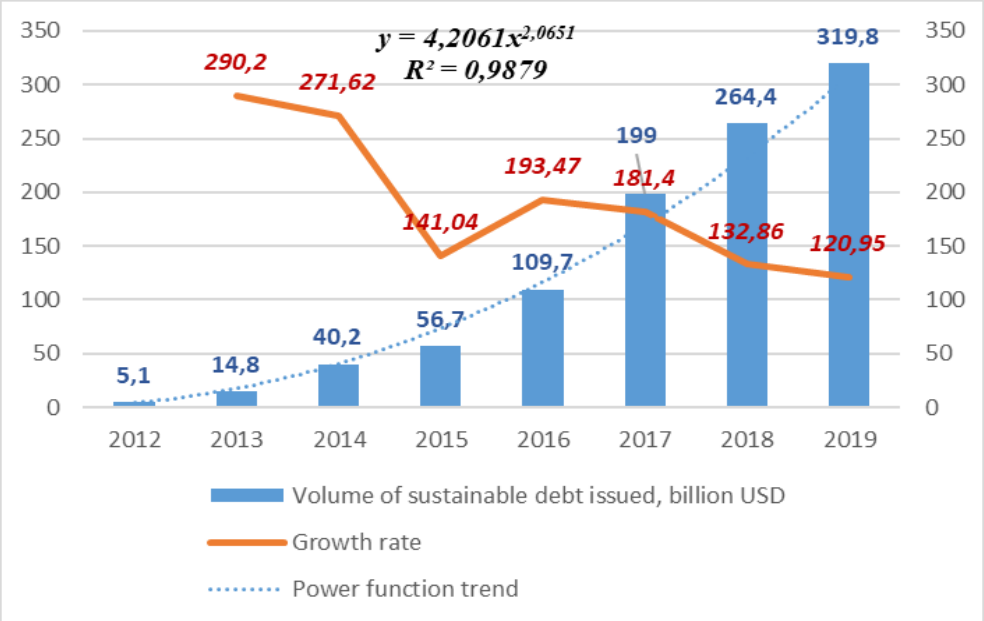

Figure 6. The evolution in dynamics and the evolution trend of the volume of sustainable debt securities issued worldwide during 2012-2019.

Source: Developed by authors based on BloombergNEF data (Henze, V., 2019)

The data presented in Figure 6 indicate an upward trend in the volume of sustainable debt securities issued between 2012 and 2019 worldwide. The calculation of the annual growth rates of the volume of issued titles allowed the authors to establish an average annual growth rate in the analyzed period of about 80.6%. The evolution trajectory

described by the power function ($y=4,2061x^{2,0651}$) shows an exponential increase in the volume of sustainable debt securities issued, and the determination coefficient R^2 (98.8%) confirms the hypothesis that the model can be used to predict the evolution for the next 2-3 years. Thus, the market for sustainable debt financial securities is constantly growing. Extensive investment projects in sustainable assets will be financed from these resources, which will have a social, economic and ecological benefit.

CONCLUSIONS

1. Public procurement is considered a tool and a catalyst for the transition to the circular economy model, given that the principles of sustainability are integrated into the process of organizing and conducting them.
2. The promotion and implementation of the circular economy model, along with sustainable and circular acquisitions to the detriment of the linear economic model, also implies investments in sustainable projects. In turn, sustainable investment requires specific financing instruments. In this context, the financial market comes with various sustainable debt securities, as evidenced by the trajectory of the evolution of the volume of securities issued in the last decade. Thus, in the period 2012-2019 the volume of sustainable debt increased 63 times. In the conditions of exponential growth, sustainable investments become quite attractive for potential investors. It should be noted that large companies have already integrated sustainable components into its financial structure, and investment companies (funds) have planned sustainable components in their portfolios.
3. Simultaneously with the allocation of resources in investment projects with a sustainable component by the corporate sector, it is necessary to develop the sustainable public investment sector and sustainable financing instruments. This can be achieved through public-private partnerships, as well as through the system of sustainable public procurement. Those stated by the authors, demonstrate once again the role of sustainable public procurement in driving the processes of integrating the principles of sustainability in various economic and financial fields.

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