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RELATING THE CONCEPT OF CIRCULAR ECONOMY TO ENVIRONMENTAL NOTIONS

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Abstract: The opportunity to study the theme related to the relationship between Circular Economy-environmental law-environmental legislation is explained by the existence of diversity on both sides at the conceptual level, as well as from the point of view of the practical aspects related to the implementation and application of the circular model in an appropriate environmental legislative framework. The socio-economic component of the Circular Economy concept shows, in its application plan, a close connection with the notions of the environment and its protection. The concept of Circular Economy cannot be manifested in a discretionary manner in order to achieve its objectives, but only by subordinating itself to environmental legislation.

Keywords: circular economy; implementation; environmental legislation; environmental protection.

1 INTRODUCTION

The present study is subordinated to the analysis of the overall theme regarding the applicability of environmental legislation in the context of the Circular Economy (CE), including the identification of particular aspects existing at this level.

According to the researched specialized literature, the proposed subject is a vast one, suitable for deepening scientific research. The concept of CE is contemporary and current, challenging from a theoretical point of view and extremely supported at a global level, regarding implementation, according to the assessments issued by the analyzed profile doctrine. The socio-economic component of the CE concept manifests, in its application plan, a close connection with the notions of the environment and its protection. The concept of Circular Economy cannot be expressed in a discretionary manner in order to achieve its objectives, but only by subordinating itself to the environmental legislation.

The targeted objectives concern the following aspects:

- identification of concerns regarding environmental issues in Romania;
- identifying examples of successful Circular Economy, compatible with environmental objectives;
- the identification of gaps regarding the applicability of environmental notions with reference to the concept of Circular Economy;
- presenting optimal solutions to improve the identified dysfunctions.

In order to fulfill the proposed objectives, the following structuring of the study was used:

- Section 1 (Introduction) marks familiarization with the issues of the proposed study, specifying, within the context of the presentation, the opportunity to study the analyzed theme and the targeted objectives;
- Section 2 (Research Methodology) presents the chosen research methodology, including the means used in the context of deepening the research of the working hypothesis;
- Section 3 (The applicability of environmental concepts in the context of the Circular Economy) analyzes some particular aspects associated with the relationship between Circular Economy-environment, proposing a series of nuances of the CE concept in the mentioned context, as well as revealing the EU's vision towards Romania (from a legislative- environmental point of view, but also from a practical one, involving environmental and economic components);
- Section 4 (The practical manifestations of the Circular Economy in an environmental context: environmental legislation, environmental law) identifies the importance of the results obtained by the research study (questionnaire) drawn up in the context of the topic addressed. Also, the case study presented (relating to the field of car batteries and accumulators) attests examples of good practices of CE implementation in Romania from the perspective of environmental legislation;
- Section 5 presents the conclusions, results and perspective obtained as a result of the analysis of the proposed theme.

2 RESEARCH METHODOLOGY

The research methodology applied within the proposed scientific research was selected in accordance with the pursued aim:

- Analysis of the elements that validate the formulated working hypothesis: "The existence of an interdependent relationship between the concept of Circular Economy and environmental legislation";
- Identification of trends regarding the applicability of the Circular Economy concept in the environmental legislative context, both theoretically and practically (presentation of concrete examples, identification of dysfunctions in application, targeted solutions).

In order to achieve the proposed study and analysis objectives, some scientific databases were consulted, such as: ScienceDirect, Web of Science, Research Gate, Google Scholar. Within the mentioned approach, keywords were used (both in Romanian and in English) according to the chosen topic. The results of the research determined the identification of the most relevant scientific articles and works in the specialized literature. Also, for the proposed purpose, other sources of information were consulted (press materials, press releases, NGOs).

Also, in order to substantiate the practical implications of the indicated issue, specific tools were used (method based on synthesis, analysis,

logical deduction, comparative method of various approaches and conceptions). The proposed questionnaire - regarding aspects of interest related to the concept of Circular Economy - provides relevant and interesting information on the respondents' familiarity with the circular economic model, as well as particular details resulting from the activity of implementing the notion in question in an environmental context. The questionnaire was addressed (in electronic format) to various legal entities with varied object of activity, compatible with the proposed study. The collection of responses recorded a relative success rate, registering 18 positive reactions (responses) out of a total of 90 requests submitted. Considering the reactions recorded in a first phase (16.12.2023-16.01.2024), the questionnaire in question is to be tested during 2024 in successive stages, in order to perform comparative analyzes on the data obtained.

3 THE APPLICABILITY OF ENVIRONMENTAL CONCEPTS (ENVIRONMENT, ENVIRONMENTAL LEGISLATION, ENVIRONMENTAL LAW) IN THE CONTEXT OF THE CIRCULAR ECONOMY. PRACTICAL ASPECTS

3.1 Clarifications on the concept of Circular Economy

The concept of Circular Economy has captured global interest from a theoretical point of view, being in perpetual metamorphosis, customization and maturation at a theoretical level (Medaglia et al., 2024; Abu-Bakar et al., 2024; Calzolari et al., 2023).

Through the benefits it promotes, it is universally embraced, in various environments, being perceived in some opinions in the ideal way, as the savior of the world economy (Wuyts, 2022).

CE has a multitude of definition variants, alternating from the expressive definition-"umbrella" type concept (Han et al., 2023) or territorial (Tapia et al., 2021), to those that express its material essence, oriented towards the socio-economic or environmental component (such as : natural resources, circulation of matter flows, its intrinsic processes, waste reduction, renewable energies, providing value) (Ekins et al., 2019; Cattelan Nobre & Tavares, 2021; Ossio et al., 2023; Figge et al., 2023).

The specialized literature has noticed the conceptual consolidation of CE, but also the emergence of definition trends during the last 5 years (Kirchherr et al., 2023).

The variant established by the Ellen MacArthur Foundation (EMAF) presents CE as a regenerative and restorative economy by intention (Ellen MacArthur Foundation, 2013), while the European Commission conceptually depicts CE as an economy "in which the value of products, materials and resources is maintained in the economy as much as possible, and the generation of waste reduced to a minimum" (COM (2015) 614 final).

The values it supports create a bridge of reconciliation and balance between the galloping socio-economic and technological progress and the state of equilibrium of the natural environment.

Circular Economy is considered the prerogative of Sustainable Development and the most suitable alternative to replace the classic economic model - the linear economy, which operated according to rigid criteria of the type "produce-use-consume-throw".

CE is designed for the present and also for future generations.

To the extent that it is properly implemented, CE promises a multitude of opportunities and advantages not only from an economic point of view, but also for the environment and society, depending on the objectives set (COM(2020) 98 final):

- climate neutrality until 2050;
- a competitive and efficient economy;
- consolidation of the industrial base at the community level;
- decoupling the economic pressure on the environment and resources;
- increasing EU GDP by 5% until 2030;
- the creation of new jobs (approximately 700,000);
- increasing the profitability of individual enterprises, protecting them against resource price fluctuations;
- limiting dependence on raw materials;
- the supply of quality, safe, functional products, designed for an extended life span;
- providing sustainable products and services;
- the opportunity to create new business models;
- contributes to the maintenance of general well-being;
- encouraging innovation and developing advanced technologies.

The goals incorporated (regarding: pollution reduction, gradual elimination of landfills and non-recoverable waste, efficient use of resources and raw materials), attest to CE's concern for the environment (ecosystems, biodiversity) and for human nature. The principles that guide CE application (such as: the precautionary principle in decision-making, the principle of preventive action, the "polluter pays" principle) are related to environmental legislation. Sanctions applicable in the case of non-compliance with environmental legislation support the hypothesis that CE cannot exercise discretionarily, by ignoring environmental law norms.

3.2 The vision of the European Union towards Romania

By assuming the status of an EU member state, Romania commits itself to an assertive and proactive attitude in terms of addressing the 3 major problems identified in 2020, at the European level: the economic situation, the climate and internal conflicts (Riegert, 2021).

The EU is perceived as a world leader, promoter of CE (COM (2020) 98 final), as well as a dedicated supporter of environmental protection.

As for the European Union's vision towards Romania, it can be seen on two levels:

❖ In terms of legislation (environmental) ("Comisia Europeană. Reprezentanța în România. Politici-cheie ale Uniunii Europene pentru România. Mediu. Schimbările climatice și degradarea mediului sunt o amenințare existențială pentru Europa și pentru întreaga lume.", 2023):
  - It is appreciated that, from a legislative point of view, Romania generally complies with the environmental requirements developed by the European Union, with a tendency for the appropriate transposition of the European environmental directives and the legal norms in the field;
  - However, specific situations were recorded, when Romania was warned by the European Commission through letters of delay regarding compliance with environmental legislation regarding atmospheric pollution and the reduction of pollutant emissions or regarding the correct transposition of some framework directives (e.g. Waste Framework Directive). For example, in 2023, the European Commission requested from Romania and other European states (Bulgaria, Estonia, Cyprus, Czech Republic, Austria) to correctly transpose the Framework Directive on waste (Directive 2008/98/CE on waste, amended by Directive (EU) 2018/851). A letter of delay was sent to Romania, and the infringement procedure was initiated -

INFR(2023)2147 (”Comisia Europeană. Reprezentanța în România. Deșeuri: Comisia solicită României, Bulgariei, Cehiei, Estoniei, Ciprului și Austriei să transpună corect Directiva-cadru privind deșeurile”, 2023).

- Problems were found in the implementation and application of the legislation, as a result of inadequate financing or the improper use of EU funds, as well as the lack of coordination and planning (according to the analyzes of the European Commission contained in the Country Report for the evaluation of the implementation of the environment - Romania, 2022) (SWD(2022) 271 final).

❖ In practical terms, involving the environmental and economic components:

Despite relative progress, a number of the country's problems were still identified: from air pollution, to water quality, waste management and illegal deforestation. Regarding the achievement of the EU's environmental policy objectives (objectives stipulated in the European Green Pact, for example), Romania has received criticism regarding the following aspects (”Comisia Europeană. Reprezentanța în România. Politici-cheie ale Uniunii Europene pentru România. Mediu. Schimbările climatice și degradarea mediului sunt o amenințare existențială pentru Europa și pentru întreaga lume.”, 2023):

- Lack of acceleration in the minimization of water and air pollution in accordance with European standards. Romania lags behind other EU states in terms of investments, public sewerage infrastructure (including connection), waste water collection;
- Air pollution is an extremely serious issue for Romania. Regarding the effective management of air pollutant sources and the (network) air quality monitoring system, they are considered to hide major deficiencies. According to the evaluations of the European Commission for the year 2022 for Romania (Country report on the evaluation of the implementation of the environment-Romania, 2022) (SWD (2022) 271 final), it was found that the National Air Pollution Control Program (NAPCP) was not adopted, as well as the unavailability of effective policies or instruments in with a view to improving air quality (forecasting, modeling, collection, monitoring, appropriate data analysis, real-time reporting of air quality data). It is also appreciated that no real progress has been made in terms of improving air quality (reduction of air pollutant emissions, industrial emissions);
- The average greenhouse gas emissions (GHG) in Romania is above the European average, but an improvement was recorded for the period 1990-2019 by approximately 55%, despite the fact that for the indicated interval the economic activity experienced an increase in percentage of approximately 89% (”Comisia Europeană. Reprezentanța în România. Politici-cheie ale Uniunii Europene pentru România. Mediu. Schimbările climatice și degradarea mediului sunt o amenințare existențială pentru Europa și pentru întreaga lume.”, 2023);
- The loss and damage to Romania's biodiversity are not adequately combated; The need for administrative involvement and additional protection of Natura 2000 sites is required (”Comisia Europeană. Reprezentanța în România. Politici-cheie ale Uniunii Europene pentru România. Mediu. Schimbările climatice și degradarea mediului sunt o amenințare existențială pentru Europa și pentru întreaga lume.”, 2023);

- Illegal deforestation represents a problem of maximum urgency that must be managed by Romania, as it generates disastrous consequences at the level of the forest fund and ecosystems; According to an analysis published by a Romanian NGO (Greenpeace Romania) regarding the illegal cutting of trees in the Romanian forests, the data indicate a continuous degradation of the forest stock between 2000-2015, registering an evolution in the number of illegal forest cuttings /day from 30 (for the years 2009-2011), to 96 (at the level of 2015) (Neagoe, 2019). At the level of 2021, the data indicated a dramatic loss of about 3 hectares of forest every hour (Borcea, 2022). The approval in 2022 by the Romanian Government of the National Strategy for Forests 2030 represents an example of concrete action by the Romanian state against the problem of illegal forest cutting (”Guvernul a aprobat HG privind Strategia Națională pentru Păduri”, 2022);
- Improper utilization of European Union funds allocated to protect the environment and to benefit from the development of the environmental infrastructure (SWD(2023) 623 final);
- The transition process to CE- rated as slow in Romania (”Raport special 17: Economia Circulară (Curtea de Conturi Europeană)”, 2023); the subject of waste management is extremely sensitive, raising serious reservations;
- Romania was ranked at the end of 2023 as the country with the lowest circularity rate in the EU, in the context of the elaboration of the Action Plan on the Circular Economy in Romania (PAEC) (approved on 05.10. 2023 by HG no. 927) (PAEC, 2023). The provisions of the PAEC complement the National Strategy for the Circular Economy from 2022 (SNEC) (”Hotărâre nr. 1172 pentru aprobarea Strategiei naționale privind Economia Circulară”, 2022) and support the achievement of the objectives established by the European Green Pact regarding climate neutrality until 2050. Specialists from the Department for Sustainable Development support the need for a proactive attitude in the implementation of PAEC and SNEC and predicts significant benefits for Romania: ”positive impact of 1.43 billion euros, 0.5% of GDP and the creation of 70 new jobs for every 1000 tons of recycled waste” (”România are cea mai mică rată de circularitate din UE”, 2023).

The perception of Romanians and their attitude towards the environment and its protection in the context of EU objectives were the subject of an opinion poll carried out by IRES (Romanian Institute for Evaluation and Strategy) during May 2021 (IRES, 2021), (Figure 1):

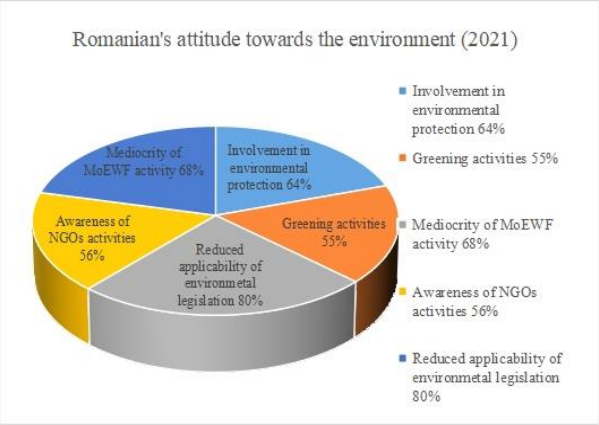

Figure 1. Romanians' attitude towards the environment in the context of EU objectives (IRES, 2021).

The results revealed that:

- Romanians have been involved to a small extent or not at all in the last 5 years (64%) in actions or activities regarding environmental protection;

- more than half of the respondents (55%) admit that they have never taken part in greening or reforestation activities;
- with regard to Romanian legislation on environmental protection, a large proportion of those surveyed (8 out of 10 people) consider its limited applicability;
- the activity carried out by NGOs is little known to the respondents (56%);
- the MoEWF activity in the last 4 years was rated as mediocre (68% of Romanians).

* *Note:* the results of the survey (study) can be consulted in detail on the IRES website.

Regarding the Romanian citizens' perspective on the "green transition", the statistical data provided by the May-June 2022 Eurobarometer confirm openness to this process (Figure 2):

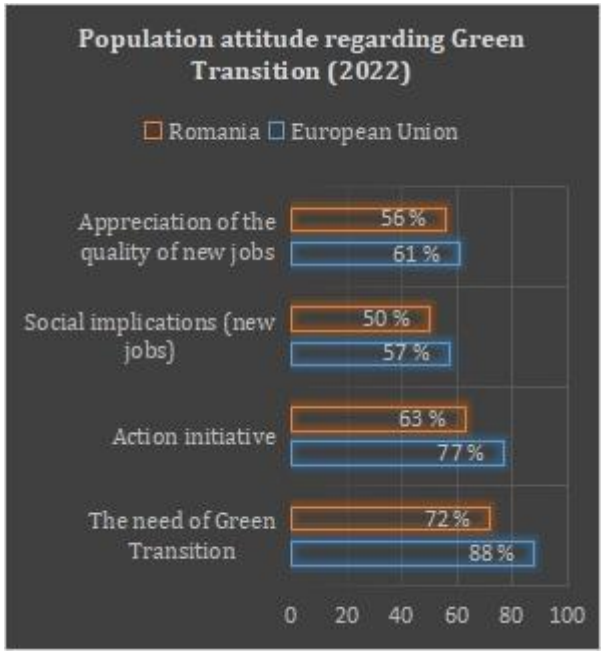

Figure 2. The population's attitude towards the Green Transition ("Eurobarometer, Survey", 2022)

Thus, compared to the European Union average of 88%, 72% of Romanians believe that the green transition is necessary ("it should not be bypassed by anyone"). Also, responsibility and action initiative characterize over half of the people surveyed - 63% of Romanians (compared to the EU average of 77%). The involvement of the EU in ensuring a fair green transition is appreciated by 57% of Romanians, while the efforts of public authorities are evaluated by citizens as positive in a slightly lower percentage (52%) ("Eurobarometer, Survey", 2022).

4 THE PRACTICAL MANIFESTATIONS OF THE CIRCULAR ECONOMY IN AN ENVIRONMENTAL CONTEXT (ENVIRONMENTAL LEGISLATION, ENVIRONMENTAL LAW)

4.1 Questionnaire regarding the application of the concept of Circular Economy in Romania in the context of environmental legislation. The importance of the results obtained

Considering the importance of the transition process towards circularity that characterizes the current Romanian economy, a research study was drawn up regarding the implementation of the CE concept.

The questionnaire was addressed in the first stage (in electronic format) to legal entities active in various fields of activity, without proceeding to any exclusion of them.

The collection of the Romanian responses (in virtual format) was carried out between 16.12.2023-16.01.2024, registering only one fifth of positive reactions (18 responses) from the total number of requests submitted.

The respondents come from: the plastics industry; public law institutions - local public authorities; education; transport operators; road vehicle maintenance and repair companies; education; the agricultural field; the veterinary-

sanitary one; construction materials and producers of handicraft and decorative objects.

The general objective pursued in the research was divided into two directions:

- identification of the degree of knowledge of the principles characterizing the specified concept (level of theoretical knowledge);
- identifying the level of application and implementation of the concept itself within the respondent's activity.

Testing the notion of Circular Economy within the proposed research study led to the following results:

- In proportion to 88%, the concept of CE is known to the respondents, through the prism of the activity of the enterprise/ company/legal person for which they did the evaluation (Figure 3);

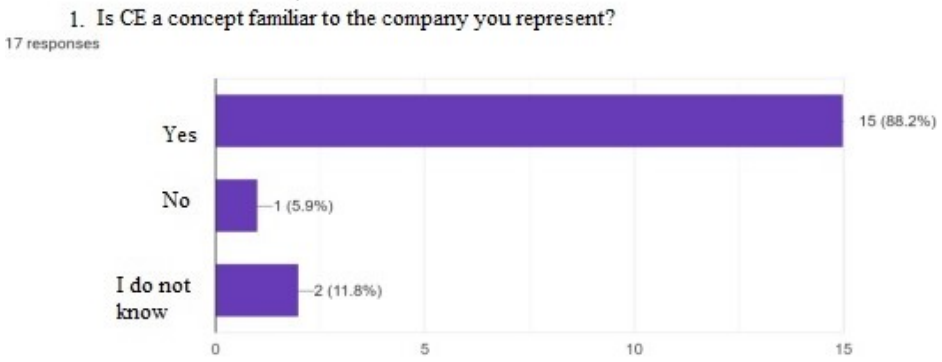

Figure 3. The level of knowledge of the CE concept for the respondents

- There is interest in acquiring new information regarding the specified concept (58%);
- The share of circularity within the represented sector was assessed as low (58%) (Figure 4);

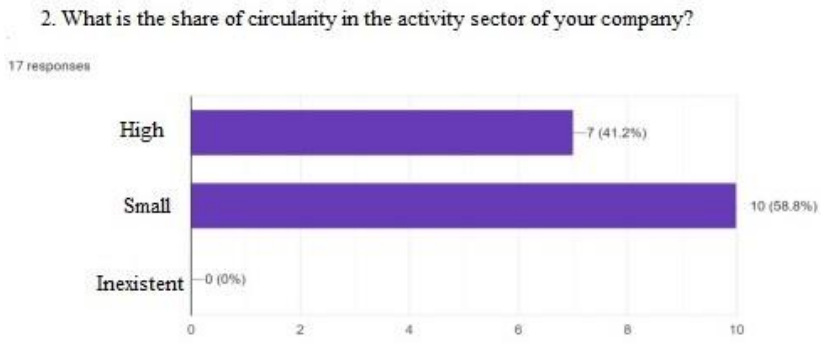

Fig. 4. The share of circularity in the activity sector represented by the respondents

- The vast majority of the people questioned introduced CE into their sphere of interest through the promotion of the Circular Economy by other bodies and organizations, respectively those from the private sector (press, NGO; etc.);

- The share of circularity within the represented sector was assessed as low (58%);
  - A high percentage of respondents (58%) appreciate a behavior according to the norms dictated by the CE regarding the waste flows resulting from the activity carried out (Figure 5);

Figure 5. The degree of inclusion of the resulting waste in the CE model.

- CE manifested itself to the greatest extent within the economic activity of the responding unit through: the reuse of products and/or its components as a way of extending the life cycle of the products; product repair, refurbishment and recycling;
- A large share of waste streams (especially plastic ones, coming from plastics, as well as packaging waste, other than plastics) are passed through the filters of actions characteristic of CE (recycling, reuse, repair, conversion, etc.);
  - In percentage of 50%, the circular success at the level of the represented entity was evaluated, being detailed and a concrete example (the creation of decorative objects/musical instruments from recyclable materials) (Figure 6);

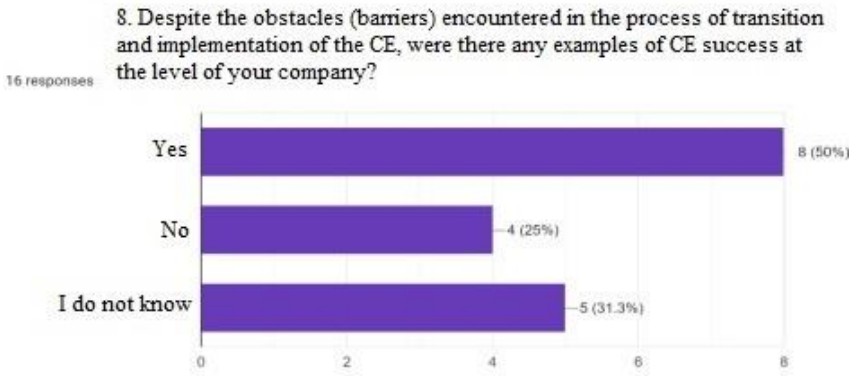

Figure 6. Evaluation of circular success within the represented activity.

- The most relevant impediments in the transition to CE were highlighted: operating costs; investment ratio/ amortization period; inadequate business and environmental infrastructure.

The results obtained attest to a relatively higher level of familiarization regarding CE, at a conceptual level, of the interviewed Romanian economic and business environment. The intention to accumulate new information about the notion in question confirms the globalized interest in this concept, at least at the theoretical level.

From the practical standpoint, it follows that the transition to CE represents- for the Romanian economic environment- a staged, long-lasting process, with lots of obstacles. In a synonymous sense, it can be stated that CE currently exists in Romania (through the prism of the achieved successes) and there is a future for this economic model (through the captured interest), with the mention of the need to adjust its manifestation framework (normative, legislative framework , technical instruments-indicators, measures to encourage and support performance, innovation, technology, economic and environmental infrastructure). Despite the apparent optimism and openness towards EC, perseverance is required in the continuation of the CE implementation process in Romania.

4.2 Practices regarding the application of the concept of Circular Economy in Romania in the context of environmental legislation

The regime of automotive and industrial batteries and accumulators, as well as the waste resulting from them, represents an eloquent example of the application of the concept of CE in relation to the notions of environmental law and related legislation, alike.

Both at the European level and for Romania as well, the field of car batteries and accumulators is a priority topic, which still raises a series of difficult problems to manage, at least at the level of their collection, storage, recycling and disposal. For the environment, through the prism of the component elements (lead, nickel, chromium, cadmium, sulfuric acid), batteries are a serious and constant source of pollution: of water, soil and subsoil (to the extent that they are buried or ”stored” at landfills), but also of the atmosphere (in the case of waste-accumulator incineration) (”Eliminarea bateriilor uzate”, 2020).

In the European economic context, the activities of recycling used batteries and therefore, of integrating these types of waste into the circular model did not register the expected parameters (minimum collection rates of 25% until September 2012, respectively of 45% until September 2016) (”Eliminarea bateriilor uzate”, 2020), so that, by way of consequence, the need for a joint effort of all those involved, from producers to the final consumer, was deduced.

Directive 2006/66/CE (on batteries and accumulators and waste batteries and accumulators) (”Directiva UE”, 2006) encourages high rates of collection and recycling of waste batteries and reduction of the amount of hazardous compounds and substances (lead, cadmium, mercury) included in battery structure. These objectives support the manifestation of the economic impulse in the context of improving environmental performance and ensuring its security. Directive 2013/56/EU (”Directiva UE”, 2013) establishes additional measures to facilitate the recycling-treatment processes of batteries and specifies the rights and obligations of manufacturers as well as end users.

Considering the same objectives, taking over the European ideational basis, the Romanian legislation mentions in the text of HG no. 1132/2008 (”Regimul bateriilor şi acumulatorilor şi al deşeurilor de baterii şi acumulatori”, 2008) a series of specific

obligations regarding the collection of waste batteries and accumulators, held in charge of: battery and accumulator manufacturers (art. 9, art. 12, art. 19), collection systems and points (art. 10, art. 11), of local public administration authorities (art. 101), but also of end users of automotive and industrial batteries and accumulators (art. 18). The removal of waste batteries and accumulators is carried out for device manufacturers under the conditions of the legal text (art. 8 para. 1, letters a-c and para. 2 of HG no. 1132/2008), and the treatment and recycling activities aim at the disposal of accumulators and of batteries from the area of unsorted municipal waste, optimizing the separate collection of these types of goods and therefore, achieving a high level of recycling (art. 9 para. 1).

As a curiosity related to this type of batteries, it is useful to state that globally, their recycling rate has been assessed as the highest (99%) compared to other goods or products (26% tires; 55% aluminum cans; 26% glass containers) (Figure 7) (”Battery Recovery”, n.d.).

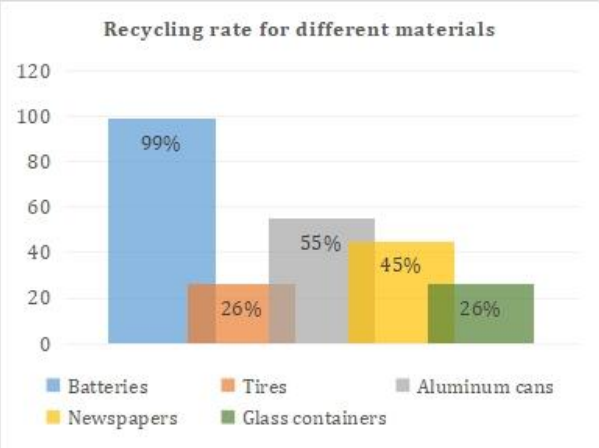

Figure 7. Recycling rate for different materials. (”Battery Recovery”).

However, in the assessment of the same source, the percentage of 1% of non-recycled batteries is equivalent to about 2 million batteries that are actually abandoned in inoperable equipment or vehicles every year, a detail considered as worrying. In Romania, in the context in which the popularity of lead-sulfuric acid car batteries is clearly superior to other types of batteries (for financial reasons), the recycling rate evaluated by a national car battery manufacturer (ROMBAT Bistrița) - market leader - indicates results as being positive, from the point of view of the economic impact upon the ecological one. Thus, according to data provided by ROMBAT, in the Rebat center (own center opened in Copșa Mică in 2005 for the recycling of used batteries) (Raport ROMBAT, 2020):

- approximately 2000 tons of materials harmful to the environment are recycled monthly;
- approximately 98% of lead is recovered from the collected batteries, as well as other materials (sulfur, polypropylene);
- around 85% of the battery content is recovered, treated, transformed into raw material and reintroduced into the technological production cycles;
- the largest amount of used batteries is recycled annually at the national level, regardless of the original basic manufacturer.

According to the values promoted by the CE and in the context of Romanian environmental legislation, the circuit of the lead-acid car battery involves a route in clearly defined stages (Figure 8).

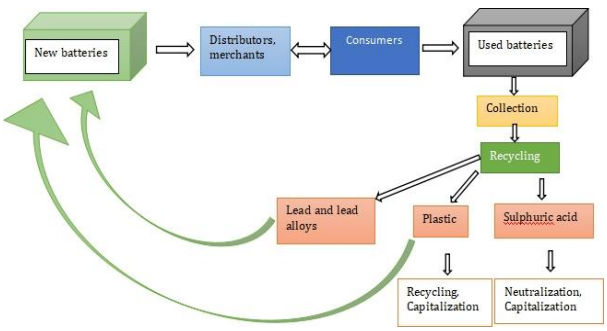

Figure 8. Lead-acid battery circuit. ”(Raport ROMBAT”, 2020)

Contrary to the slogan characteristic of the linear economy (”produce-use/consume-throw”), the CE model sees used batteries as more than unimportant and unusable waste. Thus, based on the CE's socio-economic and environmental values, also promoted in a legislative context (HG no. 1132/2008), the sale of car batteries and accumulators involves a two-way relationship between distributors/ manufacturers/service workshops and consumers, assuming the obligation to accept used batteries, without charging any additional cost for the waste product handed over. Attention is paid to the way of collecting the respective waste, since batteries and accumulators that show damage to the case or leakage of electrolyte, necessarily require separate collection, in special container-type receptacles (”Acumulatori auto”, n.d.). It is absolutely forbidden to actually throw them away, as they are considered hazardous waste. The recycling process is extremely important for all types of batteries and accumulators, because (”Acumulatori auto”, n.d.):

- it allows the recovery of component materials (such as: silver, cobalt, nickel, cadmium);
- it saves energy in the case of their reuse (about 75% for cadmium and nickel, compared to slow extraction and refining processes);
- the reintroduction into the economic circuit as raw materials of materials and component substances from batteries and accumulators, after going through some processes of cleaning, sorting, treatment, testing (for example, following the neutralization with caustic soda of sulfuric acid from lead batteries, water obtained is released into the public sewage system, after cleaning, treatment and testing; the sodium sulfate resulting from the neutralization of sulfuric acid is incorporated into various detergents or fertilizers (”Reciclarea bateriilor auto”, 2023);
- it brings benefits to the environment by preventing the harmful effects of pollution and affecting human health.

Currently, in the context of the green transition (toward clean energies), the production and development of batteries (as an essential structural element of the European automotive industry) constitutes a strategic imperative for Europe (COM(2020) 798 final). In consideration of the stated environmental and economic-social objectives, related to the alarming evolution of the negative consequences on the environment, the EU started:

- ensuring a clean, competitive and sustainable industrial sector (”Noua strategie industrială a UE”, 2020);
- imposing of new rules designed to lead to the creation of more efficient, sustainable and ethical batteries (”Noi reguli pentru baterii mai durabile și mai etice”, 2022);
- modernization and adaptation of the normative and legislative framework regarding batteries (”Consiliul adoptă un nou regulament privind bateriile și deșeurile de baterii”, 2023; ”Noi reglementări UE pentru a face bateriile mai eficiente și mai rezistente”, 2023).

The conclusions resulting from the presented case study capture the following aspects:

- The production of batteries represents an objective for Romania in the context of the green transition and implicitly an activity with important consequences at the social level (job creation), economically (it can determine economic growth);
- The field of battery production and development is based on the objectives of CE implementation, bringing together socio-economic and

environmental components (through the lens of recycling processes, recovery of substances and component materials from used batteries, their reuse);

- The national industry producing batteries is in continuous development and transformation (aligning with European legislation in the field), showing openness to research and innovation.

5 CONCLUSIONS

All The analysis of the specialized literature selected in accordance with the proposed study topic, the information obtained as a result of the exploitation of the research methods and tools approached, as well as the examples provided lead to the following observations and conclusions:

- ✓ The relevant literature presents CE as a universal concept in full development, metamorphosis and expansion, extremely attractive at the theoretical level; From a practical point of view, CE exceeds the community territorial limits, being implemented globally;
- ✓ Economic circularity is considered the most viable solution in the context of the perpetuation of the destructive effects of the linear mentality and the exacerbation of environmental problems (pollution, waste, damage to biodiversity, degradation of natural resource reserves);
- ✓ The principles with which the CE concept is associated (through the incorporated precautionary-preventive, educational, guidance or sanctioning components) converge towards the declared objective of environmental protection (combating climate change, limiting pollution, reducing dependence on raw materials, protection of natural resource reserves, minimization of waste production) characteristic of environmental law;
- ✓ CE implementation is also carried out under the conditions stipulated by environmental law, in the context of its special legal rules (imperative or permissive), non-compliance with them entailing specific environmental legal liability (civil, contraventional or criminal);
- ✓ There is a global circularity gap of 7.1% (COM(2023) 306 final; The Circularity Gap Report, 2023), which raises questions about the process of differentiated CE implementation;
- ✓ The EU stands as a fervent promoter of CE, constantly supporting the transition to CE through a diversity of legislative initiatives undertaken in accordance with the horizontal European environmental policy;
- ✓ From the point of view of economic circularity in Romania, the research results support the aspect of a slow, difficult transition, despite the existing optimism at the theoretical level;
- ✓ Initiatives regarding CE implementation come largely from private economic operators, which betrays the urgent need to involve state authorities and institutional/public law factors;
- ✓ Although there were positive assessments from the EU regarding the legislative aspect in Romania, the most significant dysfunctions were noted regarding the practical implementation of the measures drawn up, implying for certain specific problems (waste, air pollution) sanctions from EU (letters of delay, fines, establishment of the infringement procedure);
- ✓ In the mentioned context, it is necessary to accelerate the CE implementation in Romania and support the transition process through a proactive attitude on the part of the responsible factors;

- ✓ Perseverance is required in educating a diverse public (politicians, third-party decision-makers, state authorities and institutions, companies from the private business environment, investors, suppliers, employees, customers, consumers, NGOs, trade unions, the academic environment) in order to adopt and promote a responsible behavior towards the environment, but also to eliminate the obstacles encountered in the transition to the Circular Economy (cultural, socio-economic, political, technological barriers);
- ✓ The adoption of measures aimed at aligning the Romanian economy with the Circular Economy, such as: encouraging the investment sector and innovative business models through appropriate legislative measures; improving infrastructure and technology still dependent on the linear model; streamlining the management of waste (reducing landfills, emphasizing selective collection); prompt intervention and the application of concrete solutions to reduce pollution (atmospheric, noise); determining the judicious use of resources (especially by industrial giants), by implementing appropriate economic-legal instruments (for example, in the field of water);
- ✓ The scientific approach undertaken highlighted the fact that the conceptual essence of CE is based on the object, objectives and functions of environmental law;
- ✓ The application of the CE concept cannot be dissociated from the notion of environment;
- ✓ Although domestic environmental law is currently in a modest condition, the literature has noticed a tendency to develop the doctrine;
- ✓ Environmental legislation is generally properly adapted to European requirements, but the major problems boil down to the effective application of the rules in question, especially in the context of CE implementation;
- ✓ Systematization of environmental legislation; its concentration in special codes (implying of course also the institution of environmental legal liability); increasing the efficiency of the application of preventive, coercive and sanctioning measures; the introduction of new technical and legal instruments to support the remediation of environmental damage; the initiation of measures (including in the form of financial incentives, tax and fee exemptions) intended to stimulate and motivate economic operators in order to apply the environmental legislation properly and to implement the CE more easily.

The conclusion captures the concept of Circular Economy in full process of evolution at the theoretical level and maturation at the global level. Conceived as a practical tool in the management of the crisis facing modern society from an economic, as well as a climatic point of view, the concept itself finds fertile ground and guiding levers in the framework of environmental law, regardless of whether the reporting refers to the international law of environment or to the internal, national one.

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