Original article http://dx.doi.org/10.18623/rvd.v22.2800-ing

THE CIRCULAR ECONOMY AND ITS RELATION WITH THE BRAZILIAN NATIONAL SOLID WASTE POLICY: INNOVATION OR A RISK OF RECYCLING POLICIES THAT REMAINED ON PAPER?

A ECONOMIA CIRCULAR E SUA RELAÇÃO COM A POLÍTICA NACIONAL DE RESÍDUOS SÓLIDOS: INOVAÇÃO OU RISCO DE RECICLAGEM DAS POLÍTICAS QUE FICARAM NO PAPEL?

Article received on: 08/13/2024
Article accepted on: 03/19/2025

Tarin Cristino Frota Mont'Alverne*
* Faculdade de Direito, Universidade Federal do Ceará (UFC), Fortaleza/CE, Brazil
Lattes: http://lattes.cnpq.br/3890234334285222
Orcid: https://orcid.org/0000-0003-3824-6666
tarinfmontalverne@yahoo.com.br

João Ricardo Holanda**
** Faculdade Luciano Feijão (FLF), Sobral/CE, Brazil
Lattes: http://lattes.cnpq.br/9664318010346250
Orcid: https://orcid.org/0000-0002-2498-0600
jricardo_direito@yahoo.com.br

The authors declare no conflict of interest.

Abstract
Implementing environmental public policies in Brazil has become increasingly urgent due to the need to achieve the United Nations Sustainable Development Goals (Agenda 2030). The growing production of environmental legislation seems to reflect this urgency (at least formally), as per Bill no. 1.874/2022, which proposes the National Policy on Circular Economy. This qualitative and bibliographic research analyzes legislative proposals and the scientific literature, focusing on secondary data regarding the implementation of environmental public policies. It examines the bill to identify its key concepts, objectives, principles, and instruments, as well as the broader concept of circular

Resumo
A efetivação de políticas públicas ambientais no Brasil ganha contornos mais urgentes, dada a necessidade de alcançar os Objetivos do Desenvolvimento Sustentável da ONU (Agenda 2030). O aumento da produção legislativa ambiental parece acompanhar, pelo menos formalmente, essa urgência, como no caso do Projeto de Lei n. 1.874/2022, que propõe a Política Nacional da Economia Circular. O artigo, por meio de pesquisa qualitativa e bibliográfica, com análise de propostas legislativas e produções científicas, centrada em dados secundários sobre a implementação de políticas públicas ambientais, analisa o referido projeto de lei para identificar seus principais conceitos, objetivos, princípios e ferramentas, além do conceito de economia circular e como

economy and the development of international debates on the subject. Furthermore, this study assesses the convergence of Bill no. 1,874/2022 with the provisions of the National Solid Waste Policy (Law no. 12,305/2010) and highlights implementation challenges and the risks of reiterating theoretical concepts without effective application. Ultimately, the findings indicate that legislative production alone is insufficient to achieve sustainable development goals as it tends to recycle policies that remain confined to legal frameworks without practical enforcement.
Keywords: circular economy; European Union; sustainable development.

o debate internacional tem se desenvolvido a respeito. Também se verifica a confluência do PL 1.874/2022, com dispositivos existentes na Política Nacional de Resíduos Sólidos (Lei n. 12.305/2010), além de problemas de implementação e riscos de repetição de conceitos que não se concretizam. Por fim, conclui-se que a mera produção legislativa não alcançará as metas ambientais de desenvolvimento sustentável, apenas reutilizando políticas que ficaram nos papéis legais.
Palavras-chave: *desenvolvimento sustentável; economia circular; União Europeia.*

Introduction

The United Nations has repeatedly warned about three-front planetary crisis, requiring countries to adopt measures toward mitigating environment-related issues. Several nations, including Brazil, have discussed a pillar of this crisis: pollution.

Figures from the 2022 Panorama of Solid Waste in Brazil by the Brazilian Association of Public Cleaning and Special Waste Companies show that the country generated about 81.8 million tons of waste in 2021, i.e., the average Brazilian produced 1.043 kg of waste per day. In 2010, the year in which the Brazilian National Policy for Solid Waste (PNRS) was adopted as law (Law no. 12.305/2010), that panorama pointed to the generation of 60.8 million tons.

The striking comparison by the 2022 Brazilian Association of Public Cleaning and Special Waste Companies panoramas on inadequate final disposal indicates that 42.4% of municipal solid waste Brazil generated in 2010 had an inadequate final disposal, equaling 38.9% in 2022 (which still represents 27,917,624 tons of waste with improper disposal in that year alone).

With a new international dynamic under the influence of the Sustainable Development Goals of the UN 2030 Agenda, Brazil has discussed and proposed legislative instruments to try and adapt to an ecological transition while maintaining dialogue with civil society, as per the presentation by the Ministry of Finance of the Ecological Transformation Plan (the Green Package), which has recently undergone analysis by the Brazilian Business Council for Sustainable Development.

The data show that many Brazilian public policies face difficulties in practical application. The PNRS exemplifies the innovative and modern legislation, in accordance with international legislation, but that is unable to be put into effect.

This study aims to analyze the concrete adequacy of legitimate environmental norms that lose strength or are forgotten under this growing debate after the creation of new texts that promise to address problems that have yet to be concretely solved.

This research will address a few legislative proposals, especially the 2002 Bill no. 1,874, which aims to institute a National Circular Economy Policy, mainly by creating systemic dialogues between the actors in the life cycle of products to reduce waste and enhance the return of packaging and other materials to the beginning of the production chain.

This research is being developed within the scope of a project funded by the Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES) toward studies on sea resources and against plastic pollution in the Blue Amazon. This project belongs to a broader research initiative on circular economy and its practices around the world toward understanding and fostering strategies to mitigate the environmental impacts due to solid waste, especially plastics. By analyzing sustainable approaches in international contexts, we aim to contribute to the formulation of guidelines and solutions that integrate the principles of circular economy into environmental management policies in Brazil, promoting greater effectiveness in the transition to a more sustainable economic model.

This research is part of a PhD thesis that aims to contribute to the evolution of discussions and the practical implementation of circular economy in Brazilian law. The continuity of this study will analyze the challenges and opportunities of implementing this model in the national legal and regulatory context in further detail, subsidizing the improvement of public policies and the integration of more effective mechanisms in waste management. Thus, it aims to strengthen the applicability of circular economy as an essential instrument for sustainability and environmental preservation in Brazil.

1 The proposal to create the National Circular Economy Policy: advances or setbacks?

The concept of circular economy has gained relevance on the global stage as a sustainable strategy to produce, consume, and manage resources. Reflecting this trend, the Brazilian National Congress has built proposals to create circular

economy policies. This section aims to evaluate these proposals in progress, especially Bill no. 1,874/2022, which aims to create the National Circular Economy Policy.

This study will describe the legislative proposals in force (including the history of the processing of Bill no. 1,874/2022) to then show the main concepts, objectives, principles, and instruments of a project that aims to structure the operationalization of a circular economy in Brazil.

1.1 The national proposals on a circular economy and the history of Bill no. 1,874/2022

At least four legislative proposals offer similar or complementary ideas that are yet to undergo legislative deliberation.

The proposal under the number 3,899/2012—which aims to establish the "National Policy to Stimulate Sustainable Production and Consumption" (Brasil, 2012)—Bill no. 5,296/2016—which seeks to provide for the "National Policy for Sustainable Production and Consumption" and to institute the "Sustainable Product Seal and the Sustainable Service Seal for economic activity with superior environmental performance"[1] (Brasil, 2016)—and Bill no. 1,755/2022, which aims to institute the Circular Economy Incentive Program (Brasil, 2022a, free translation).

The Federal Senate also currently processes Bill no. 2,524/2022 (Brasil, 2022c), which aims to regulate a "circular economy of plastic", ratifying the scenario of broad legislative production and scarce systemic debate between the proposals and what is currently in force on the topic of circular economy.

In addition to proposals, Law no. 12,305/2010 substantiates the PNRS (the focus of this study) to find the legislative methods in force the objects of which resemble the ongoing projects and proposals.

These proposals attempt to create a system that enables regulation and contact between manufacturers, producers, distributors, traders, and consumers to reduce potential polluters from the beginning of the production chain to their final disposal, which can be achieved by reusing products. Another characteristic unites these proposals: they have neither become legislation nor have been debated or deliberated for this purpose.

1 In the original: "sobre a Política Nacional de Produção e Consumo Sustentáveis e instituir o Selo Produto Sustentável e o Selo Serviço Sustentável para a atividade econômica com desempenho ambiental superior".

Thus, this study aims to analyze Bill no. 1,874/2022, which intends to institute a "National Circular Economy Policy" (Brasil, 2022b) since, on March 12, 2024, the Federal Senate found the urgent need to process this legislative proposal (which soon approved it on March 19, 2024).

Thus, this was the first of the aforementioned projects—which only aims to exemplify the range of proposals with similar intentions—to have its urgency recognized. In addition to this urgency, it configures a more robust project than the others as it lists objectives and concepts and aims to change provisions in other equally important legislation, such as the New Public Bids and Administrative Contracts Act (Law no. 14,133/2021) and some rules on incentives in research and technology.

These facts justify the choice of this study to address Bill no. 1,874/2022, which, in addition to its more recent processing in the National Congress, brings, in its content, the idea of the Chamber of Deputies joining it to the other aforementioned bills. Thus, this topic will analyze its aims.

Bill no. 1,874/2022 constitutes one of the legislative proposals stemming from the work of the Ecological Generation Forum, which the Environment Commission of the Brazilian Federal Senate established in 2021. The Ecological Generation Forum included civil society, industrial, economic, and environmental organizations (Brasil, 2022d) and the Economic Commission for Latin America and the Caribbean of the United Nations.

After discussing the Ecological Generation Forum, the president of the Environment Commission in the Brazilian Federal Senate Senator Jaques Wagner (PT-BA) presented Bill no. 1,874/2022 on July 4, 2022. Since then, it has had regular processing, with the approval of its urgency on March 12, 2024. In total, 18 amendments to the initial text have been discussed. Finally, according to the opinion of the Committee on Economic Affairs (Brasil, 2024), it added amendments 1 through 14 and 16 through 18. The consolidated text for deliberation finally included amendment no. 19 (a substitute for the Committee on Economic Affairs).

After approval by the Federal Senate plenary, it was sent to the House of Representatives. On April 8, 2024, upon receiving the Bill, the president of the House determined its attachment to Bill no. 1,755/2022, which aims to institute the Circular Economy Incentive Program (Brasil, 2022a)—which, in turn, has had no legislative progress in the House of Representatives since July 2022.

However, before describing the concerns about the delay and disorder in the processing of similar or complementary facts in the national legislature, the points in the proposal deserve mention.

Note that discussing all its concepts, principles, or instruments exceeds the scope of this study. This research will prioritize the propositions linked to the PNRS due to the need for dialogue between policies toward their greater effectiveness.

1.2 The concepts, objectives, principles, and instruments of Bill no. 1,874/2022

The final text of the analyzed bill describes, in its Art. 2, 18 items that identify concepts to interpret the intended law. Some deserve mention, such as the concept of the product life cycle, which emerges in Art. 2, II, of the Bill (Brasil, 2022b, free translation):

> Art. 2. For the purposes of this Law, the following are considered:
> […]
> II – product life cycle: a series of steps that involve obtaining raw materials, product development and design, the production process, marketing, use, reuse, repair, remanufacturing, recycling, compostability, and regeneration; […][2].

This first example already evinces that the debates that fostered the creation of Bill no. 1,874/2022 ignored the normative framework in Law no. 12,305/2010 regarding the concept of product life cycle, as per its Art. 3, IV (Brasil, 2010, free translation):

> Art. 3 For the purposes of this Law, the following are considered:
> […]
> IV – product life cycle: a series of steps that involve the development of the product, the acquisition of raw materials and inputs, the production process, consumption, and final disposal; […][3].

A constant concern in the aim of this research refers to the absence of dialogue with existing norms during the creation of new legislative models in Brazil. This case shows a symptomatic disorder since the project—although finding the need to formally amend several Brazilian legislations, such as the New Public Bids

2 In the original: "Art. 2º. Para os fins desta Lei, consideram-se:
[…]
II – ciclo de vida do produto: série de etapas que envolvem a obtenção de matérias-primas, o desenvolvimento e o desenho do produto, o processo produtivo, a comercialização, o uso, o reuso, o reparo, a remanufatura, a reciclagem, a compostabilidade e a regeneração; […]".

3 In the original: "Art. 3º Para os efeitos desta Lei, entende-se por:
[…]
IV – ciclo de vida do produto: série de etapas que envolvem o desenvolvimento do produto, a obtenção de matérias-primas e insumos, o processo produtivo, o consumo e a disposição final; […]".

and Administrative Contracts Act (Law no. 14,133/2021) and the Pre-Salt Law (Law no. 12,351/2010)—fails to even mention the PNRS, which has prominent relevance in the topic, with tools in force in the country since 2010. The scarce dialogue between the existing norms and those that are intended to be created in Brazil can represent a serious problem of the concreteness of public policies. How many "national policies" will the Brazilian State need to be able to orderly implement environmental legislation? Environmental laws without proper enforcement are unable to serve their purposes.

Before trying to respond (if possible) to this provocation, other concepts in Bill no. 1,874/2022 that can innovate the legal system, such as the "just transition" in item XVII of its Art. 2, require attention (Brasil, 2022b, free translation):

> Art. 2. For the purposes of this Law, the following are considered:
> […]
> XVII – just transition: a set of principles, processes, and practices aimed at equity and social justice related to the workforce and the transition scenario to the circular economy that contribute to the professionalization in our labor markets, the creation of opportunities, the promotion of decent work, social inclusion, and the eradication of poverty[4].

Nations seeking to meet important environmental and climate goals in their legal and social vocabulary (such as those related to the energy transition for clean energy generation) often defend a "just transition" as a central concept for setting social goals for the energy transition taking place in the world (Motte-Baumvol, 2023).

Some researchers with such aim stand out, such as Julia Motte-Baumvol, for whom the just transition should avoid the increase or non-reduction of the vulnerability of social groups that disproportionately suffer from climate change due to energy transition mechanisms (2023).

Beyond concepts, some of the objectives and principles in Arts. 3 and 4 of Bill no. 1,874/2022 deserve mention. They include the "promotion of new business models based on circularity criteria and their solutions"[5] and the "maintenance of products and materials in use, regeneration of natural systems, and minimization

4 In the orginal: "Art. 2º. Para os fins desta Lei, consideram-se:
[…]
XVII – transição justa: conjunto de princípios, processos e práticas orientados para a equidade e a justiça social, relacionados à força de trabalho e ao cenário de transição para a economia circular, e que contribuem para a profissionalização em nossos mercados de trabalho, a criação de oportunidades, a promoção do trabalho decente, a inclusão social e a erradicação da pobreza".

5 In the original: "promoção de novos modelos de negócio baseados em critérios de circularidade e suas soluções".

of the use of non-renewable natural resources as inputs or raw materials, as well as the generation of waste and pollution associated with production"[6], as per items II and VIII of its Art. 3 (Brasil, 2022b, free translation).

Considering the great challenges in these objectives, one—indicated in Art. 3, IV (Brasil, 2022b)—aims to encourage research, development, and innovation to promote circularity. The point deserves mention as its legislators found that creating and executing innovative practices require the constant and profuse participation of research environments, academia, and researchers, whose work must be recognized and fostered by state incentives.

As for the principles in Art. 4 of Bill no. 1,874/2022, this study highlights that which determines the "elimination, from the beginning of the production chain, of waste and pollution, observing the design of products, services, and systems"[7] (Brasil, 2022b, free translation). This principle in item I represents the concern related to the shared responsibility for the life cycle of products and proposes a reflection on the elimination of waste and pollution since the beginning of production, directly dialoguing with the PNRS.

Similarly, the principle in item XII also suggests a great influence of the legal contributions within the PNRS—although its legislators are yet to render it explicit—as it proposes the "non-generation, reduction, reuse, sharing, recovery, and 'remanufacturing' and recycling, as well as the regeneration of nature, to create a circular system"[8] (Brasil, 2022b, free translation).

The concepts, objectives, and principles of Bill no. 1,874/2022 are embodied in the tools created and listed in its Art. 5, which can be considered another of its positive points. In addition to listing its legal purposes, it points out tools to achieve its objectives, which are often lacking in several national legal instruments.

This study will now analyze some of these tools, especially those that concern the debate on its guiding question.

Bill no. 1,874/2022 proposes the creation of the "National Forum for Circular Economy" in its Arts. 5, I, 6 and subsequent (Brasil, 2022b). In theory, the Forum has some specific attributions, such as the preparation of action plans—as

6 In the original: "manutenção de produtos e materiais em uso, regeneração de sistemas naturais e minimização da utilização de recursos naturais não renováveis como insumos ou matérias-primas, assim como da geração de resíduos e da poluição associada à produção".

7 In the original: ""eliminação, desde o início da cadeia produtiva, de resíduos e da poluição, observando o desenho dos produtos, serviços e sistemas".

8 In the original: "não geração, redução, a reutilização, o compartilhamento, a recuperação e 'remanufatura' e a reciclagem, bem como a regeneração da natureza, a fim de criar um sistema circular".

provided for in the PNRS—and the awareness and mobilization of society to promote a circular economy and its just transition.

However, note that the terms of Art. 8, I, the proposal (Brasil, 2022b, free translation) lists 10 Ministers of State as members of the Forum and that its items II and III suggest the participation of

> Art. 8. The members of the National Circular Economy Forum are:
> I – […]
> II – personalities and representatives of civil society with notorious knowledge of the subject or who are agents with responsibility for aspects of the circular economy;
> III – representatives of the industrial, commercial, agricultural, and service business sectors[9].

Bill no. 1,874/2022 provides for a Forum with an equal basis, i.e., five members from civil society representatives and five others from commercial sectors since it reserved 10 seats for the federal government.

Regarding the federative pact, Bill no. 1,874/2022 failed to determine the creation of state or municipal councils or forums, which would be very important to distinguish the specificities of each region from the whole. It only provides for the National Forum of Circular Economy to encourage the creation of state and municipal forums, which seems to hinder the regionalization of decisions.

At this point, the proposal seems to distance debate, discussions, and the production of ideas from people in general, especially from the vulnerable groups involved in the process, such as recyclable material collectors. The PNRS, in turn, establishes the integration of waste collectors "in actions that involve shared responsibility for the life cycle of products"[10] as one of its objectives (Brasil, 2010, free translation). By limiting the composition of the forum to the federal level, it risks distancing the actors closest to the problems and solutions.

Still regarding recyclable material collectors, they received a significant role in constructing the goals and objectives created by the PNRS. The participation of waste collectors represents an essential instrument to monitor the life cycle of products (Brasil, 2010), so that an environmental transition without their participation makes no sense and could not, therefore, represent the scenario of a just transition.

---

9 In the original: "Art. 8º. São membros do Fórum Nacional de Economia Circular:
I – […]
II – personalidades e representantes da sociedade civil, com notório conhecimento da matéria ou que sejam agentes com responsabilidade sobre aspectos da economia circular;
III – representantes do setor empresarial industrial, comercial, agropecuário e de serviços".

10 In the original: "nas ações que envolvam a responsabilidade compartilhada pelo ciclo de vida dos produtos".

For example, to pursue the UN Sustainable Development Goals (2030 Agenda), some authors have argued that the actions the UN seeks should be defined in a more punctual way. Adapting the Sustainable Development Goals to local realities (Andrade *et al.,* 2023) represents an important factor in the participation of local governments and entrepreneurs toward solutions and point out the specific problems of those localities.

The federal centralization of actions, discussions, and planning may threaten the concrete potential of future legislation if approved. This is what usually happens with most environmental public policies, as with the PNRS. Therefore, this tool can be relevant if it includes greater federative participation in the achievement of its objectives.

The consolidation of legislative debates combined with scientific thinking and international trends on circular economy can maximize the implementation of national environmental policies. Thus, the next topic exemplifies the concept of circular economy by describing what many countries have tried to render it a concrete tool for sustainable development.

2 The concept of circular economy and the international debate

China developed one of the first examples of a state movement seeking tools for a circular economy. Faced with the necessary readjustment of its development scenario and its environmental impacts in the early 2000s, China adopted new development strategies (Lieder; Rashid, 2016) editing, in 2008, its Law for the promotion of the Circular Economy (Bleischwitz *et al.*, 2022).

Chine aimed to implement a circular economy model to attack the scarcity of natural resources by improving energy efficiency and reducing energy consumption and pollutant and greenhouse gas emissions. Its model targeted a three-level implementation: in companies, reducing the consumption of materials and energy in products and services; in the region, establishing industrial ecoparks to promote symbiosis between companies; and in society, by promoting the recycling and reuse of waste (Li; Lin, 2016).

Many countries and regions structured their own such policies after China. In 2015, the Circular Economy Action Plan of the European Union (its first comprehensive initiative) comprised an entire region and several countries. The United States launched its Sustainable Materials Management Action Plan in 2015. South Korea launched its Framework Act on Resource Circulation in 2016, and Italy, its Towards a Model of Circular Economy for Italy in 2017 (Italy, 2017).

Federative initiatives other than national ones are also noteworthy, as per municipal or regional legislation, including the Circular Economy Procurement Implementation Plan and Framework in Toronto, in 2018 (OECD, 2018); the Circular Economy Plan of Paris 2017-2020 in Paris, in 2017; and the more recent Paris 2024 Strategy for a More Circular Event.

The Chinese industrial economic model has an advantage over Western countries regarding the possibilities of economic circularity since industrial parks and export processing zones concentrate these activities. However, despite some important examples, such as the use of copper recovered from waste from other industrial parks instead of using virgin copper from the Suzhou New District, the Chinese progress has been modest (Mathews; Tan, 2016).

However, authors say that the Chinese actions toward a circular economy surpass those in other parts of the world, such as Japan, the United States, and Germany. Some of these initiatives, as per Mathews and Tan (2016, p. 441), have limited impact and scale:

> No other country has such ambitions. Germany and Japan have comprehensive plans for recycling (through Germany's Closed Substance Cycle and Waste Management Act of 1996 and Japan's 2000 Fundamental Law for Establishing a Sound Material-cycle Society). The European Commission announced a Circular Economy Package in December 2015 but has yet to implement it. The United States has hundreds of corporate recycling initiatives (including those of the machinery company Caterpillar and Interface, a carpet manufacturer). The United States also has a handful of regional programmes such as the Zero Waste scheme in San Francisco, California. Other initiatives involving closing loops to attain 'industrial symbiosis' — in which waste products of one firm become the raw materials of another — are in place in Yokohama, Japan; in Ulsan, South Korea; and in Kwinana, Australia. All these are limited in their impacts and scale.

This change in mentality regarding the creation and insertion of products in the market and the possibility of these products being reused economically requires a panoramic and systemic look at who should act so that this evolution can happen. As an example, the Circular Economy Action Plan of the European Union (EU, 2020) points out that government action plays a key role in the interaction between the affected social niches that can contribute to the development of a circular economy.

In this sense, the Economic Cooperation and Development (OECD, 2018) proposes to promote some principles: the efficient use of resources throughout the life cycle of products, the alignment of sectoral policies with these guidelines to efficiently use resources, and the strengthening of policies based on data analysis and result evaluation.

A circular economy proposes changing the logic of production and insertion of goods in the market, which must happen with the State in constant dialogue with those who suffer the effects of the new policies and those who can contribute to it. This is what Luc Ferry proposes (2023, p. 131-132, free translation) due to the need to change the current paradigm and, for this, "it is, of course, from the side of the industrialists and merchants that awareness must emerge"[11], although it is necessary to "offer them something unlike degrowth; which no one wants: neither industrialists, merchants, peoples, nor politicians"[12].

Studies on this economic concept evince the need for a systemic culture that can absorb resources and mitigate their waste with a new recycling model, which should start in the production of materials, as per Bocken *et al.* (2017, p. 6):

> Based on these different contributions, we define the Circular Economy as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.

McDonough and Braungart (2002) suggest a model that rethinks the industry so that the resources inserted in the market can return to their origin, i.e., reuse, decreasing industrial expenditures and environmental impacts. With their "cradle to cradle" vision, which continuously reuse and recycle materials in a closed loop, the authors argue that this approach tends to mimic natural cycles and promote regeneration and sustainable growth, and may eliminate the concept of waste.

Circular economy models propose the adaptation of economic scenarios to the environment, which may maintain or expand the development of people, companies, and the State. Thus, a circular economy constitutes a restorative and regenerative process that aims to maintain products, components, and materials at their highest level of utility and value, differentiating technical from biological cycles and offering the ideal approach for sustainable economic growth (Barboza *et al.*, 2019).

Bill no. 1,874/2022 proposes to establish concepts, create principles and objectives, and use tools to achieve the objectives of a circular economy. Whether this combination of efforts will be effective remains unknown. It will depend,

11 In the original: "é, evidentemente, do lado dos industriais e dos comerciantes que a conscientização deve ocorrer".

12 In the original: "lhes oferecer algo diferente de um decrescimento, que ninguém quer, nem os industriais, nem os comerciantes, nem os povos, nem os políticos".

among other things, on its ability to aggregate and engage people and governments to promote environmental public policies, which the PNRS has scarcely managed to obtain.

For Abdalla and Sampaio (2018, p. 82, free translation), the circular economy can be made effective by the corroboration of "people and governments with the promotion of public policies, investments in research, and the dissemination of the need for a profound change in social behavior in the consumption of durable and non-durable goods"[13].

Regarding the concept of circular economy, note its several concepts on changing production processes and the aspects of reuse of products in the market. There exist countless possibilities to conceptualize the term, but the problem analyzed around the world and proposed in Brazil reflects the concern with the need for a systemic conduct that can align governments, productive environments, and people. Kirchherr *et al.* (2017, p. 228) describes the problem thusly:

> […] we have gathered 114 circular economy definitions which were coded on 17 dimensions. Our findings indicate that the circular economy is most frequently depicted as a combination of reduce, reuse and recycle activities, whereas it is oftentimes not highlighted that CE necessitates a systemic shift.

Still in this vein, Leitão (2015, p. 160, free translation), finds that

> The transition to a CE [circular economy] requires systemic change, affecting all actors in the value chain, as well as substantial innovations in technology, organization, and society as a whole. It requires a pressing need for new skills from people, most especially from creative design, advertising, and digital disciplines rather than only from science, engineering, and technology[14].

In an environmental state (Sarlet; Fensterseifer, 2011), national practices would be of no use if other nations laid at the mercy of the obligation to effectively prevent environmental damage. Thus, a circular economy makes more sense in a global context in which its objectives are achieved in a structured and systemic way, which would represent what José Joaquim Gomes Canotilho (2001, p. 8, free translation) calls the "globalist postulate":

13 In the original: "pessoas e governos com a promoção de políticas públicas, investimentos em pesquisas e a difusão da necessidade de uma profunda mudança de comportamento social no consumo de bens duráveis e não duráveis".

14 In the original: "A transição para uma EC exige uma mudança sistémica, que afeta todos os intervenientes na cadeia de valor, assim como inovações substanciais na tecnologia, na organização e na sociedade como um todo. Requer uma necessidade premente de novas habilidades das pessoas, muito especialmente, de disciplinas criativas de design, publicidade e digital e não apenas dentro da ciência, engenharia e tecnologia".

> The globalist postulate can be summarized as follows: the protection of the environment should not be done at the level of isolated legal systems (state or not) but at the level of legal-political, international, and supranational systems so as to achieve a reasonable ecological environmental standard at a planetary level and, at the same time, to structure a global responsibility (of states, organizations, groups) regarding the requirements of environmental sustainability[15].

Thus, an effective national circular economy requires more than a simple bill: an engagement of various sectors and the construction of policies in other countries. In the case of the European Union, the Commission presented a document entitled "A new Circular Economy Action Plan – For a cleaner and more competitive Europe" (2020).

In its recent experience, the European Union approved its Action Plan for the Circular Economy in 2020, establishing an orderly project to recycle waste. According to the new legislative package, the percentage of municipal waste sent for recycling should reach 55% in 2025, 60% in 2030, and 65% in 2035. The amount of municipal waste landfilled should remain below 10% in 2035 and plastic packaging recycling should increase from 50% in 2025 to 55% in 2030 (EU, 2020).

The goals of the European Union intend to make concrete strategies to design products that, by their production process, can achieve the potential for reuse by producers and consumers.

Thus, consolidating a circular economy finds clear support in international attempts and faces difficulties as it proposes a certain disruption of traditional models. However, it may offer an element of union between the dialogues of economic initiative that are usually used to reject environmentally appropriate hypotheses.

The challenge is greater in Brazil in view of its recent experiences. Created in 2010, the PNRS exemplifies a program to generate the circularity of the economy that suffers from the inefficiency of the mechanisms to carry out its activities, as per the next section.

15 In the original: "O postulado globalista pode resumir-se assim: a proteção do ambiente não deve ser feita a nível de sistemas jurídicos isolados (estatais ou não), mas sim a nível de sistemas jurídico-políticos, internacionais e supranacionais, de forma a que se alcance um standard ecológico ambiental razoável a nível planetário e, ao mesmo tempo, se estruture uma responsabilidade global (de estados, organizações, grupos) quanto às exigências de sustentabilidade ambiental".

3 The example of the PNRS and its relationship with Bill no. 1,874/2022: how to avoid repeating the same mistakes?

The PNRS, instituted by Law no. 12,305/2010, represents an important milestone in waste management in Brazil, establishing guidelines for the integrated and sustainable management of solid waste. But, over the years, several gaps and challenges have become evident in the implementation of this policy, requiring critical analysis and the search for innovative solutions. Bill no. 1,874/2022 arises in this context, and this section will address how the PNRS interacts with Bill no. 1,874/2022, highlighting the need to avoid current mistakes and explore new approaches for more effective waste management.

This section will first discuss the history and evolution of the PNRS, emphasizing how a circular economy can complement and strengthen this policy. Then, it will analyze whether the new proposals constitute any innovation of the current legislation or if they repeat established strategies (as in reverse logistics). Finally, it will examine the crucial role of producers in the transition to a more sustainable economy and the implications for a just economic transition, addressing possible mechanisms and incentives to ensure the effectiveness of these policies.

3.1 The context of the PNRS and its relation with the circular economy proposal

Establishing the writing criteria for this topic requires great care as determining a legislative standard between the PNRS and circular economy proposals may confuse readers, especially regarding Bill no. 1,874/2022, which offers yet another attempt to create a "national policy" for the environment.

In 2010, by creating the PNRS, Brazilian legislators seem to have established concepts, objectives, principles, and tools to reduce waste production in Brazil and to perhaps improve the efficiency of the productive sector by rendering it accountable for the life cycle of products.

The objective of the text was to create a system that aimed (and still does) to stimulate the adoption of sustainable patterns of production and consumption of goods and services by the cooperation between the several spheres of power and society (Brasil, 2010).

Since 2010, a legislative text can determine the dialogue between the production sectors and lead the Brazilian state and private sectors toward the notions of a circular economy. Analyzing some of the principles of the PNRS render its

statements even more clearly (Brasil, 2010, emphasis added, free translation):

> Art. 7. The objectives of the National Solid Waste Policy are:
> […]
> II– **non-generation, reduction**, reuse, recycling, and treatment of solid waste, as well as environmentally appropriate final disposal of waste;
> III – encouragement for the **adoption of sustainable patterns of production and consumption of goods and services**;
> IV – adoption, development, and improvement of **clean technologies** as a way to minimize environmental impacts;
> […]
> VI– **encouragement of the recycling industry**, with a view to promoting the use of raw materials and inputs derived from recyclable and recycled materials;
> […]
> XI– **priority in government procurement and contracting** toward:
> a) recycled and recyclable products;
> b) goods, services, and works that consider criteria compatible with socially and environmentally sustainable consumption patterns;
> […]
> XIV– incentive to the development of **environmental and business management systems aimed at improving production processes** and the reuse of solid waste, including energy recovery and use; […][16]

Bill no. 1,874/2022 fails to represent a legislative innovation in Brazil as its legislators suggested neither alteration, recognition, improvement nor complementation to the existing provisions in force since 2010 in any line of its proposal.

The final report of the Ecological Generation Forum of the Environment Committee of the Federal Senate, which provided the theoretical substrate

16 In the original: "Art. 7º. São objetivos da Política Nacional de Resíduos Sólidos:
[…]
II – **não geração, redução**, reutilização, reciclagem e tratamento dos resíduos sólidos, bem como disposição final ambientalmente adequada dos rejeitos;
III – estímulo à **adoção de padrões sustentáveis de produção e consumo de bens e serviços**;
IV – adoção, desenvolvimento e aprimoramento de **tecnologias limpas** como forma de minimizar impactos ambientais;
[…]
VI – **incentivo à indústria da reciclagem**, tendo em vista fomentar o uso de matérias-primas e insumos derivados de materiais recicláveis e reciclados;
[…]
XI – **prioridade, nas aquisições e contratações governamentais**, para:
a) produtos reciclados e recicláveis;
b) bens, serviços e obras que considerem critérios compatíveis com padrões de consumo social e ambientalmente sustentáveis;
[…]
XIV – incentivo ao desenvolvimento de **sistemas de gestão ambiental e empresarial voltados para a melhoria dos processos produtivos** e ao reaproveitamento dos resíduos sólidos, incluídos a recuperação e o aproveitamento energético; […]".

to formulate Bill no. 1,874/2022, failed to even mention the literal confusion between some of the concepts, objectives, principles, and tools that make the PNRS and Bill no. 1,874/2022 very similar (including grammatical aspects).

The Analysis these texts shows a mostly empty innovative content of Bill no. 1,874/2022 due to the objectives this section has analyzed and the several tools from the PNRS that were repeated by the literalness of the bill that aims to create the National Circular Economy Policy.

As an example, the following instruments of the PNRS have existed since 2010 in the Brazilian normative plan (Brasil, 2010, emphasis added, free translation):

> Art. 8 The instruments of the National Solid Waste Policy are, among others:
> […]
> III – selective collection, **reverse logistics systems** and other tools related to **Implementing shared responsibility for the product lifecycle**;
> […]
> VI – technical and financial cooperation between the public and private sectors for the **development of research into new products, methods, processes, and technologies for the management, recycling, reuse, waste treatment, and environmentally appropriate final disposal of waste**;
> VII – scientific and technological **research**;
> VIII – environmental **education**;
> IX– **tax**, financial, and credit **incentives**;
> X – the National Fund for the Environment and the National Fund for Scientific and Technological Development; […][17].

On the date of its enactment in 2010, the text of Law no. 12,305 proposed the disruptive innovation of the existing models. Therefore, its concepts, objectives, and tools remain in line with the current progressive protection of environmental law and the systemic action of organisms, reducing the environmental impacts from the generation of polluting products by seeking alternatives to create

17 In the original: "Art. 8º São instrumentos da Política Nacional de Resíduos Sólidos, entre outros:
[…]
III – a coleta seletiva, os **sistemas de logística reversa** e outras ferramentas relacionadas à **implementação da responsabilidade compartilhada pelo ciclo de vida dos produtos**;
[…]
VI – a cooperação técnica e financeira entre os setores público e privado para o **desenvolvimento de pesquisas de novos produtos, métodos, processos e tecnologias de gestão, reciclagem, reutilização, tratamento de resíduos e disposição final ambientalmente adequada de rejeitos**;
VII – a **pesquisa** científica e tecnológica;
VIII – a **educação** ambiental;
IX – **os incentivos fiscais**, financeiros e creditícios;
X – o Fundo Nacional do Meio Ambiente e o Fundo Nacional de Desenvolvimento Científico e Tecnológico; […]".

a scenario that can think products regarding their reuse from the beginning of the production chain.

Despite its modern text and alignment with international discussions, the Bill still fails to establish how to implement the practices in the PNRS and how to evaluate whether circular economy proposals can contribute to this or if they will only print already legislated texts, corroborating the practical inefficiency of national environmental policies such as the reverse logistics system.

3.2 Circular Economy Policy as a complement or repetition of the reverse logistics system

Brazilian environmental public policies suffer from the lack of concreteness of their modern concepts (on paper). The reverse logistics system serves as an example as it "aims to reduce the amount of solid waste by planning manufacturers, aiming [sic] that the consumer reuses the packaging, promising to reduce waste and damage to the environment"[18] (Nascimento; Lima, 2018, p. 205, free translation), a system that, despite being created in 2010, is yet to significantly affect the national production chain.

According to the most up-to-date data from the National Information System on Solid Waste Management (Brasil, 2020), the implementation of reverse logistics programs remains precarious. The case of "packaging in general" serves as an example, as it features in a system the managing entity Coalizão Embalagens coordinates, which, despite its 1,922 member companies, only develops the system in 374 municipalities in Brazil.

According to the Brazilian Association of Public Cleaning and Special Waste Companies (2022), "packaging in general" still has low recycling potential in the country. Estimates suggest that, despite a potential 40.1% recycling of paper and cardboard in 2022, Brazil only recycled 23.9% of all metal, 23.2% plastic, and 11.2% glass waste. Note that the numbers had been tallied under the regulation proposed for reverse logistics by Decree no. 10,936 of January 12, 2022, the text of which aimed to unite the State and the productive sector in reusing and creating products that encourage non-disposal (Brasil, 2022), which seems to be the central objective of Bill no. 1,874/2022.

Thus, the history of the PNRS can offer an important lesson for those who

18 In the original: "visa reduzir a quantidade de resíduos sólidos, por meio do planejamento dos fabricantes, visando [sic] que o consumidor reutilize a embalagem, prometendo reduzir o desperdício e o prejuízo ao meio ambiente".

intend to approve the National Circular Economy Policy. What does this new bill offer regarding effective novelties to the national environmental protection system? The answer seems easy when one finds that the legislative debate forgets some points considered important for implementing a circular economy, such as producers' responsibility.

3.3 Producers' responsibility and a possible path toward a just economic transition

With the analysis focused on the history of the PNRS, it seems unsafe to say that the texts that propose a circular economy can differently and, therefore, efficiently execute their objectives, especially because Bill no. 1,874/2022 suggests the regulation of several points, such as the National Forum of Circular Economy (Art. 8, sole paragraph) and the percentages of incentives for technological development and innovation (Art. 13).

The Global Sustainable Development Report (UN, 2023) warns of serious obstacles hindering the achievement of objectives. Thus, partnerships and strategies with the public and private sectors tend to be relevant for the pursuit of meeting goals and for Brazil to effectively constitute a "restorable paradise" (Caldeira *et al.*, 2020).

The profusion in the emergence of new "national policies" that remain on paper must not be the strategy Brazil seeks to fulfil the UN 2030 Agenda. Its possible National Circular Economy Policy must dialogue with the Brazilian legislative scenario to complement it and prevent it from configuring another policy that becomes "soft law" (Andrade *et al.*, 2023), i.e., recyclers of other laws that remain only on paper.

Environmental laws with low effectiveness potential fail to serve current needs, which demand urgency for mechanisms that dialogue with the development of sustainable practices. In the context of the transition to a circular economy model, the great debate around extended producer responsibility aims toward greater engagement of producers to insert recyclable, returnable, and reusable products in the market.

The Economic Cooperation and Development (OECD, 2016) shows that the concept has grown in recent decades in Asias, African, and South American countries:

> EPR [extended producer responsibility] policies to help improve recycling and reduce landfilling have been widely adopted in most OECD countries; product coverage has been expanded in key sectors such as packaging, electronics, batteries and vehicles; and EPR schemes are spreading in emerging economies in Asia, Africa and South America, making it relevant to address the differing policy contexts in developing countries.

As part of the development of circular policy discussions on plastic pollution, the United Nations Environment Programme (UN, 2022) reached an agreement in 2022 to end plastic pollution by 2024.

The United Nations Environment Programme (UN, 2023) has published a report to examine the economic and business models needed to address the impacts of the plastics economy, considering extended producer responsibility as one of the most important topics in the quest to combat plastic pollution and the ability to compel companies to take joint responsibility for their products and the packaging waste they create, as per the discussed topic:

> In an EPR scheme, companies must take either individual or collective responsibility for their products and packaging waste. Since it is more challenging to monitor and enforce systems based on individual responsibility, collective responsibility models are more common. A collective responsibility system requires a central organisation within the EPR to coordinate activity within the system. This organisation is known as the PRO or the system operator, and takes over the responsibilities of the obliged companies in the collective system. This obliges companies to take joint responsibility for their products and the packaging waste that they create (OECD, 2016).

The PNRS indicated the shared responsibility for the life cycle of products as one of its principles and evinced the need for specific responsibility for producers, as per its Art. 31:

> Art. 31. Without hindering the obligations set out in the solid waste management plan and with a view to strengthening shared responsibility and its objectives, **manufacturers, importers, distributors, and traders have responsibilities that include**:
>
> I – investment in the development, manufacture, and marketing of products:
>
> a) suitable for reuse, recycling, or other environmentally appropriate forms of disposal after use by the consumer;
>
> b) of which the production and used generate the least amount of solid waste as possible;
>
> II – dissemination of information regarding ways to avoid, recycle, and eliminate solid waste associated with their respective products;
>
> III – collection of products and waste remaining after use, as well as their subsequent environmentally appropriate final disposal in the case of products subject to a reverse logistics system in accordance with Art. 33;

> IV – a commitment to, when agreements or terms of commitment are signed with the Municipality, participate in the actions provided for in the municipal plan for integrated solid waste management in the case of products not yet included in the reverse logistics system[19] (Brasil, 2010, free translation, emphasis added).

Despite the international recognition of the need to stipulate a system of accountability aimed at producers to reduce waste and promote a circular economy, national legislative proposals on circular economy such as Bill no. 1,874/2022 fail to directly mention this tool.

Bill no. 1,874/2022 only indicates, as one of its principles, the traceability of inventories and flows — as per item VIII of its Art. 4. However, it seems necessary to expressly mention the responsibility of producers as a government incentive model that can create an effective interest in producers to keep products in the cycle for as long as possible and establish an instrument that can complement or replace the PNRS with concrete elements that can promote a just transition to a circular economy.

Regarding the intention of promoting a just transition to a circular economy, Bill no. 1,874/2022 (Brasil, 2022b, free translation, emphasis added) proposes the creation of a just transition mechanism with the following objectives:

> I – **to support the transition to low-carbon and climate-resilient activities**;
> II – to stimulate the creation of new jobs in the circular economy;
> III – to encourage research and innovation for social technologies, the development of individual or collective skills in circular design, **including knowledge of Indigenous peoples and small farmers in the regenerative use of natural resources, and the development of circularity technologies, including knowledge acquired from waste collectors on the recyclability of materials, as well as from the workers involved** in the value retention phase, such as repair, reuse, and remanufacturing;
> IV – to promote the provision of technical assistance;
> V – **to promote access to finance for local public authorities[20]**.

19 In the original: "Art. 31. Sem prejuízo das obrigações estabelecidas no plano de gerenciamento de resíduos sólidos e com vistas a fortalecer a responsabilidade compartilhada e seus objetivos, **os fabricantes, importadores, distribuidores e comerciantes têm responsabilidade que abrange**:
I – investimento no desenvolvimento, na fabricação e na colocação no mercado de produtos:
a) que sejam aptos, após o uso pelo consumidor, à reutilização, à reciclagem ou a outra forma de destinação ambientalmente adequada;
b) cuja fabricação e uso gerem a menor quantidade de resíduos sólidos possível;
II – divulgação de informações relativas às formas de evitar, reciclar e eliminar os resíduos sólidos associados a seus respectivos produtos;
III – recolhimento dos produtos e dos resíduos remanescentes após o uso, assim como sua subsequente destinação final ambientalmente adequada, no caso de produtos objeto de sistema de logística reversa na forma do art. 33;
IV – compromisso de, quando firmados acordos ou termos de compromisso com o Município, participar das ações previstas no plano municipal de gestão integrada de resíduos sólidos, no caso de produtos ainda não inclusos no sistema de logística reversa".

20 In the original: "I – **apoiar a transição para atividades de baixo carbono e resilientes ao clima**;

The proposal also includes the offer of targeted support by the just transition mechanism "to the most affected regions and sectors", which represents another indication that the projects for the circular economy in Brazil have a non-specific character and fail to establish evaluation criteria to analyze its allocation to regions and sectors, which will greatly affect assessments of the degree of justice of this transition.

This evinces the need for a serious and systemic legislative discussion that can assess whether projects contribute to the legislative system to avoid activities that fail to contribute to the proposed purposes that, such as climate demands, are urgent in their concrete application.

Conclusion

The normative text the National Congress discusses adds normative elements to the concept of circular economy and supports measures to transform the relations between the State and the most profusely productive and mercantile sectors to reduce the emission of waste and enhance the reuse of products in the market.

The relevant provisions in Bill no. 1,874/2022 even refer to the recent experiences of the European Union on the subject. It has generally clear concepts and tools that seem to sustain the application of its objectives and proposal, clearly aiming to change some current normative contexts in Brazil, such as the New Public Bids and Administrative Contracts Act and the Pre-Salt Law.

Thus, its text aligns itself with the concept of circular economy and with the dictates recently faced by the international community. However, any concept, objective, principle, and tool provided for in Bill no. 1,874/2022 fail to serve as legal innovations in Brazil since they resembled the PNRS, created by Law no. 12,305/2010, the mechanisms of which face many concrete difficulties to protect the Brazilian environment.

Parts of the legislative in Bill no. 1,874/2022 failed to consider the previous public policies that several factors rendered ineffective.

II – estimular a criação de novos empregos na economia circular;

III – incentivar a pesquisa e a inovação para tecnologias sociais, o desenvolvimento de competências individuais ou coletivas em desenho circular, **incluindo conhecimentos de povos originários e pequenos agricultores no uso regenerativo de recursos da natureza, e o desenvolvimento de tecnologias de circularidade, incluindo conhecimentos adquiridos de catadores de materiais recicláveis sobre a reciclabilidade de materiais, bem como dos trabalhadores envolvidos** na fase de retenção de valor, como reparo, reúso e remanufatura;

IV – promover a prestação de assistência técnica;

V – **promover o acesso ao financiamento para as autoridades públicas locais**".

Rehashing robust, complex, and old public policies fails to configure the best way for Brazil to seek to meet the UN Sustainable Development Goals (2030 Agenda) given the risk that new "national policies" will resemble old ones in view of the "innovation of the time" and their practical inefficiency as the State and the legislated entities fail to meet its objectives.

This is the case with the PNRS, which has undergone constant regulation, extending its proposals almost *ad aeternum* so they might be concretely established one day. This study suggests that legislative debates follow a dialogue with current standards to enable concrete and balanced solutions and integrate environmental policies, the effectiveness of which depends on an articulated rather than an isolated approach.

Thus, Brazilian legislators must learn the lesson from the PNRS so a National Circular Economy Policy would avoid "running in circles".

References

ABDALLA, F. A; SAMPAIO, A. C. F. Os novos princípios e conceitos inovadores da Economia Circular. *Revista Entorno Geográfico, Calle*, n. 15, p. 82-102, fev./jun. 2018. Available from: https://www.researchgate.net/profile/Entorno-Geografico/publication/353687653_Os_novos_principios_e_conceitos_inovadores_da_Economia_Circular/links/610a935c1e95fe241aaca88d/Os-novos-principios-e-conceitos-inovadores-da-Economia-Circular.pdf. Access on: April 2, 2024.

ANDRADE, I. O *et al*. Organização das Nações Unidas e o Objetivo de Desenvolvimento Sustentável 14: desafios para o Brasil na Década do Oceano. *Texto para Discussão.* Brasília-Rio de Janeiro, maio 2023. Available from: https://repositorio.ipea.gov.br/bitstream/11058/12243/1/TD_2881_web.pdf. Access on: March 10, 2024.

ASSOCIAÇÃO BRASILEIRA DE EMPRESAS DE LIMPEZA PÚBLICA E RESÍDUOS ESPECIAIS. *Panorama dos Resíduos Sólidos no Brasil 2022*. São Paulo: ABRELPE, 2022. Available from: https://abespb.com.br/wp-content/uploads/2023/12/Panorama_Abrelpe_2022.pdf. Access on: April 20, 2024.

BARBOZA, V. D. A *et al.* Aplicação da economia circular na construção civil. *Research, Society and Development*, Vargem Grande Paulista, v. 8, n. 7, e9871102, 2019. Available from: https://rsdjournal.org/index.php/rsd/article/view/1102/918. Access on: April 10, 2024.

BLEISCHWITZ, R. *et al.* The circular economy in China: achievements, challenges and potential implications for decarbonisation. *Resources, Conservation and Recycling*, Birmingham, v. 183, ago. 2022. Available from: https://www.sciencedirect.com/science/article/pii/S0921344922001951. Access on: April 14, 2024.

BOCKEN, N. M. P. *et al.* The circular economy – a new sustainability paradigm? *Journal of Cleaner Production*, Amsterdam, v. 143, n. 1, p. 757-768, fev. 2017. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0959652616321023?via%3Dihub. Access on: April 16, 2024.

BRASIL. Decreto n. 10.936, de 12 de janeiro de 2022. Regulamenta a Lei n. 12.305, de 2 de agosto de 2010, que institui a Política Nacional de Resíduos Sólidos. *Diário Oficial da União:* seção 1, Brasília, DF, p. 2, 12 jan. 2022. Available from https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/decreto/D10936.htm. Access on: April 2, 2024.

BRASIL. Lei 12.305, de 2 de agosto de 2010. Institui a Política Nacional de Resíduos Sólidos; altera a Lei no 9.605, de 12 de fevereiro de 1998; e dá outras providências. *Diário Oficial da União:* seção 1, Brasília, DF, ano 147, p. 3, 3 ago. 2010. Available from: https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm. Access on: April 2, 2024.

BRASIL. Lei n. 12.351, de 22 de dezembro de 2010. Dispõe sobre a exploração e a produção de petróleo, de gás natural e de outros hidrocarbonetos fluidos, sob o regime de partilha de produção, em áreas do pré-sal e em áreas estratégicas; cria o Fundo Social – FS e dispõe sobre sua estrutura e fontes de recursos; altera dispositivos da Lei no 9.478, de 6 de agosto de 1997; e dá outras providências. *Diário Oficial da União:* seção 1, Brasília, DF, ano 147, n. 245, p. 1, 23 dez. 2010a. Available from: https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12351.htm. Access on: April 2, 2024.

BRASIL. Lei n. 14.133 de 1º de abril de 2021. Lei de Licitações e Contratos Administrativos. *Diário Oficial da União:* seção 1, Brasília, DF, p. 1, 1 abr. 2021. Available from: https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/l14133.htm. Access on: April 2, 2024.

BRASIL. Ministério do Meio Ambiente. Sistema Nacional de Informações sobre a Gestão de Resíduos Sólidos. *Relatório Nacional de Gestão de Resíduos Sólidos.* Brasília, DF: SINIR, 2020. Available from: https://sinir.gov.br/relatorios/nacional/. Access on: Feb. 24, 2025.

BRASIL. *Projeto de Lei n. 1.755 de 2022. Ins*titui o Programa de Incentivo à Economia Circular. Brasília, DF: Câmara dos Deputados, 2022a. Available from: https://www.camara.leg.br/proposicoesWeb/fichadetramitacao/?idProposicao=2330233. Access on: April 2, 2024.

BRASIL. *Projeto de Lei n. 1.874 de 2022*. Institui a Política Nacional de Economia Circular e altera a Lei n. 10.332, de 19 de dezembro de 2001, a Lei n. 12.351, de 22 de dezembro de 2010, e a Lei n. 14.133, de 1º de abril de 2021, para adequá-las à nova política. Brasília, DF: Câmara dos Deputados, 2022b. Available from: https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=2422879. Access on: April 2, 2024.

BRASIL. *Projeto de Lei n. 2.524 de 2022*. Estabelece regras relativas à economia circular do plástico; altera a Lei n. 9.605, de 12 de fevereiro de 1998, para dar coercitividade à nova Lei, tipificando condutas relativas ao seu descumprimento; e altera a Lei n. 14.119, de 13 de janeiro de 2021, para incluir as atividades das cooperativas e associações de catadores de materiais reutilizáveis e recicláveis no Programa Federal de Pagamento por Serviços Ambientais. Brasília, DF: Senado Federal, 2022c. Available from: https://www25.senado.leg.br/web/atividade/materias/-/materia/154790. Access on: April 16, 2024.

BRASIL. *Projeto de Lei n. 3.899 de 2012*. Institui a Política Nacional de Estímulo à Produção e ao Consumo Sustentáveis. Brasília, DF: Câmara dos Deputados, 2012. Available from: https://www.camara.leg.br/proposicoesWeb/fichadetramitacao/?idProposicao=545304. Access on: April 2, 2024.

BRASIL. *Projeto de Lei n. 5.296 de 2016*. Dispõe sobre a Política Nacional de Produção e Consumo Sustentáveis e institui o Selo Produto Sustentável e o Selo Serviço Sustentável para a atividade econômica com desempenho ambiental superior. Brasília, DF: Câmara dos Deputados, 2016. Available from:https://www.camara.leg.br/proposicoesWeb/fichadetramitacao/?idProposicao=2084625. Access on: April 2, 2024.

BRASIL. Senado Federal. *Fórum da Geração Ecológica:* sumário executivo – relatório final. Brasília, DF: Senado Federal, 2022d. v. 1. Available from: https://ww2.contag.org.br/documentos/pdf/relatorio-final-do-forum-de-geracao-ecologica.pdf. Access on: March 19, 2024.

BRASIL. Senado Federal. *Parecer (SF) n. 4 de 2024*. Da Comissão de Assuntos Econômicos, sobre o Projeto de Lei n. 1.874 de 2022, da Comissão de Meio Ambiente (SF), que institui a Política Nacional de Economia Circular e altera a Lei n. 10.332, de 19 de dezembro de 2001, a Lei n. 12.351, de 22 de dezembro de 2010, e a Lei n. 14.133, de 1º de abril de 2021, para

adequá-las à nova política. Brasília, DF: Senado Federal, 5 mar. 2024. Available from: https://legis.senado.leg.br/sdleg-getter/documento?dm=9557655&ts=1711548732195&rendition_principal=S&disposition=inline. Access on: March 19, 2024.

CALDEIRA, J.; SEKULA, J. M; SCHABIB, L. *Brasil, paraíso restaurável*. Rio de Janeiro: Estação Brasil, 2020.

CANOTILHO, J. J. G. Estado constitucional ecológico e democracia sustentada. *Revista do Centro de Estudos de Direito do Ordenamento, do Urbanismo e do Ambiente (CEDOUA)*, Coimbra, v. 4, n. 2, p. 9-16, 2001. Available from: https://www.cedoua.fd.uc.pt/wp-content/uploads/RevCEDOUA/Rev_8.pdf. Access on: Feb. 24, 2025.

CONSELHO DA UNIÃO EUROPÉIA E PARLAMENTO EUROPEU. Conselho aprova conclusões intituladas "Tornar a recuperação circular e ecológica". *Comunicados de imprensa*, 17 dez. 2020. Available from: https://www.consilium.europa.eu/pt/press/press-releases/2020/12/17/council-approves-conclusions-on-making-the-recovery-circular-and-green/. Access on: March 30, 2024.

FERRY, L. *Ecomodernismo*: as sete faces da ecologia política. Tradução Idalina Lopes. Santana de Parnaíba: Manole, 2023.

ITALIA. Ministero dello Sviluppo Economico. *Towards a model of circular economy for Italy:* overview and strategic framework. Roma: Ministerio dello Sviluppo Economico, 2017. Available from: https://circulareconomy.europa.eu/platform/sites/default/files/strategy_-_towards_a_model_eng_completo.pdf. Access on: March 16, 2025.

KIRCHHERR, J. *et al.* Conceptualizing the circular economy: an analysis of 114 definitions. *Resources, Conservation and Recycling,* [*S. l.*], v. 127, p. 221-232, dez. 2017. Available from: https://www.sciencedirect.com/science/article/pii/S0921344917302835. Access on: April 18, 2024.

LEITÃO, A. Economia circular: uma nova filosofia de gestão para o séc. XXI. *Portuguese Journal of Finance, Management and Accounting*, Porto, v. 1, n. 2, p. 149-171, set. 2015. Available from: https://repositorio.ucp.pt/entities/publication/6cbaa87f-65a5-41c8-bf37-4fa4e9e8c0dc. Access on: March 30, 2024.

LI, W.; LIN, W. Circular economy policies in China. *In:* ANBUMOZHI, V.; KIM, J. (ed.). *Towards a circular economy:* corporate management and policy pathways. Jakarta: ERIA, 2016, p. 95-111. Available from: https://www.eria.org/RPR_FY2014_No.44_Chapter_7.pdf. Access on: April 16, 2024.

LIEDER, M. RASHID, A. Towards circular economy implementation: a comprehensive review in context of manufacturing industry. *Journal of Cleaner Production, Ams*terdam, v. 115, p. 36-51, mar. 2016. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0959652615018661. Access on: April 19, 2024.

MATHEWS, J. A.; TAN, H. Circular economy: lessons from China. *Nature*, London, v. 531, p. 440-442, 2016. Available from: https://www.nature.com/articles/531440a. Access on: April 18, 2024.

MCDONOUGH, W.; BRAUNGART, M. *Cradle to cradle:* remaking the way we make things. New York: North Point Press, 2002.

MOTTE-BAUMVOL, J. La régulation du commerce équitable du cacao. *In:* CABANNES, X.; BLAIRON, K.; MOTTE-BAUMVOL, J. *Chocolat 100% droit*. Paris: Enrick B, 2023. p. 55-69. Available from: https://shs.hal.science/halshs-04047269. Access on: Jan. 2, 2024.

NASCIMENTO, J. R. H; LIMA, R. A. O sistema de logística reversa como forma de desenvolvimento das empresas brasileiras: o caminho do capital natural. *Veredas do Direito*, Belo Horizonte, v. 15, n. 32, p. 201-217, maio/ago. 2018. Available from https://revista.domhelder.edu.br/index.php/veredas/article/view/1247/24600. Access on: April 12, 2024.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD). *Circular Economy Procurement Implementation Plan and Framework.* Toronto, 2018. Available from: https://www.toronto.ca/legdocs/mmis/2018/gm/bgrd/backgroundfile-115664.pdf. Access on: April 20, 2024.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD). *Extended Producer Responsibility: Upd*ated Guidance for Efficient Waste Management. Paris, 2016. Available from: https://www.oecd-ilibrary.org/environment/extended-producer-responsibility_9789264256385-en. Access on: April 20, 2024.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. Assembleia do Meio Ambiente aprova acordo para acabar com poluição plástica até 2024. *ONU News*, 2 mar. 2022. Available from: https://news.un.org/pt/story/2022/03/1781522. Access on: April 20, 2024.

ORGANIZAÇÃO DAS NAÇÕES UNIDAS. *Transformando Nosso Mundo:* a Agenda 2030 para o Desenvolvimento Sustentável. Genebra: ONU, 2015. Available from: https://brasil.un.org/sites/default/files/2020-09/agenda2030-pt-br.pdf. Access on: April 21, 2024.

SARLET, I. W.; FENSTERSEIFER, T. *Direito Constitucional Ambiental:* estudos sobre a Constituição, os Direitos Fundamentais e a Proteção do Ambiente. São Paulo: Editora dos Tribunais, 2011.

UNIÃO EUROPEIA. Comissão Europeia. Direção-Geral da Comunicação. *Plano de ação para a economia circular:* para uma Europa mais limpa e competitiva. Luxemburgo: UE, 2020. Available from: https://op.europa.eu/pt/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1. Access on: March 30, 2024.

UNITED NATIONS. *Global Sustainable Development Report 2023*. New York: UN, 2023. Available from: https://sdgs.un.org/gsdr/gsdr2023. Access on: April 20, 2024.

ABOUT THE AUTHORS

Tarin Cristino Frota Mont'Alverne
Post-Doctorate research from Universidade Federal do Ceará (UFC), Fortaleza/CE, Brazil. PhD in International Environmental Law from Université Paris Descartes (Paris V), Paris, France and Universidade de São Paulo (USP), São Paulo/SP, Brazil. Has a master's degree in Public International Law from Paris V and a bachelor's degree in Law from Universidade de Fortaleza (UNIFOR), Fortaleza/CE, Brazil. Full professor at UFC.

João Ricardo Holanda
PhD student in Law at Universidade Federal do Ceará (UFC), Fortaleza/CE, Brazil. Has a master's degree in Law from Centro Universitário Christus (UNICHRISTUS), Fortaleza/CE, Brazil. Has a bachelor's degree in Law from Faculdade Luciano Feijão (FLF), Sobral/CE, Brazil. Professor of Law at FLF.

Authors' participation
Both authors actively participated in the discussions of the results, contributing jointly to the conception and development of this study. João Ricardo Holanda designed the research, helping to formulate the general objectives of this study. Tarin Cristino Frota Mont'Alverne participated in the investigation, collecting and analyzing data and developing the methodology of this study.

How to cite this article (ABNT):
MONT'ALVERNE, T. C. F.; HOLANDA, J. R. The circular economy and its relation with the Brazilian National Solid Waste Policy: innovation or a risk of recycling the policies that remained on paper? *Veredas do Direito*, Belo Horizonte, v. 22, e222800, 2025. Available from: http://www.domhelder.edu.br/revista/index.php/veredas/article/view/2800. Access on: Month. day, year.