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Legal provisions for the facilitation of the transition to a circular economy in the  
Polish legal system\*\*

*Abstract*

*The transition to a circular economy (CE) is a priority objective for European Union (EU) Member States. Specifically, this goal is stated in the 8th Environmental Action Programme (which outlines a programme until 2030), the European Green Deal, European Commission communications, and the Waste Framework Directive 2008/98/EC as amended by Directive 2018/851. As a member of the EU, Poland is obliged to align its waste management practices with the CE; this work is reflected in legislative changes related to waste, packaging, and the municipal maintenance of cleanliness and order. This article presents the legal status of the transition to a CE in Poland, including the established legal instruments. The Polish legal system has developed measures to protect the environment, life, and human health by preventing and reducing waste and improving the efficiency of raw material use. Waste management is consistent with the waste hierarchy, with a focus on maximising recovery (material and organic recycling, energy recovery), an extended producer responsibility system, and strict requirements for recovery and recycling rates, with a particular focus on plastic packaging. In Poland, the CE Roadmap—which includes a legislative toolkit on sustainable industrial production, sustainable consumption, bioeconomy, new business models, and CE implementation and monitoring – has been developed for the transformation toward a CE. Poland’s priorities in this regard include: (1) innovation, strengthening cooperation between industry and the scientific sector, resulting in the implementation of innovative solutions in the economy; (2) creating a European market for secondary raw materials, where their movement would be easier; (3) ensuring the high quality of secondary raw materials that results from sustainable production and consumption; and (4) developing the service sector.*

**Keywords:** environmental law, circular economy, waste management, legal instruments, transition, waste recovery

## 1. Introduction

Proper waste management has become a highly topical environmental, resource, and energy-related issue in the European Union (EU). Inadequate waste management contributes to adverse global climate change, depleting resources and polluting the environment. The EU’s overriding objective should therefore be to reduce the mass of waste produced and the costs of waste recovery and disposal, as reflected in the changes to the European Green Deal strategy and related policies. Moving toward a circular economy (CE) is a sure solution to these problems. Introduced by David Pearce in 1990,<sup>1</sup>

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<sup>1</sup> Pearce and Turner 1990, 112–113.



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the CE concept is based on four unrelated economic functions of the environment. The environment provides not only utility values, but also a resource base and economic benefits, as well as an essential life support system.<sup>2</sup> A CE is a regenerative system that contains resources, waste, energy emissions, and leakage, which must be minimised by slowing down, closing, and narrowing material and energy loops.<sup>3</sup> The introduction of a CE is expected to reduce waste, support reuse, and close production chains. Therefore, this approach is suitable for achieving environmental objectives.

The transition to a CE is now one of the EU's environmental priorities. However, this requires strengthening the three 'pillars' of the system, including environmental benefits, cost savings from reduced demand for natural resources, and economic benefits of creating new markets.<sup>4</sup> Member States must implement the EU's Plan for a Closed Circle Economy developed in 2015,<sup>5</sup> which is divided into sections on production, consumption, waste management, and recycling.<sup>6</sup> Further, the CE is also an appropriate model to implement in the context of the Sustainable Development Goals set out in the 2030 Agenda for Sustainable Development – especially given Goal 13 (take urgent action to combat climate change and its effects).<sup>7</sup> In the EU, the transition to a CE is currently one of the leading objectives included in the 8th Environmental Action Programme<sup>8</sup> (EAP; this programme outlines a plan until 2030). This programme sets out a framework comprising six priority objectives, the third of which is specifically about moving toward a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a CE. Notably, the 8th EAP is based on the 2019 European Green Deal (EGD),<sup>9</sup> a growth strategy that aims to transform the EU into a fair and prosperous society with a modern, resource-efficient, and competitive economy; achieve zero greenhouse gas emissions by 2050; and decouple economic growth from the use of natural resources.<sup>10</sup> The EGD situates the CE as a useful tool for accomplishing these aims. In fact, the transformation of the economy toward sustainability is based on objectives such as mobilising the industrial sector toward

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<sup>2</sup> Andersen, 2007, 133–140.

<sup>3</sup> Murray, Skene & Haynes, 2015, 379–380; See also: Geissdoerfer et al. 2017, 758.

<sup>4</sup> Taranic, Behrens & Topi, 2016.

<sup>5</sup> European Commission, Closing the Loop. An EU Action Plan for the Circular Economy Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM (2015)614/2.

<sup>6</sup> Moraga et al. 2019, 455; See also: Elia, Gnoni & Tornese 2017, 2745.

<sup>7</sup> Resolution adopted by the UN General Assembly on 25 September 2015, Transforming our world: the 2030 Agenda for Sustainable Development, A/RES/70/1.

<sup>8</sup> Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030, OJ L 114, 12.4.2022.

<sup>9</sup> European Commission, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM(2019) 640 final.

<sup>10</sup> Wolf et al. 2021, 102.

a clean, closed-loop economy.<sup>11</sup> Put differently, a CE<sup>12</sup> can support the objectives of the EGD.

More specifically, a CE is a production and consumption model that involves sharing, borrowing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible to lengthen their life cycles. In practice, this means minimising waste. At the end of the product life cycle, raw materials and waste should remain in the economy through recycling. Notably, they can be successfully reused to create additional value. In addition, a CE is a regenerative system in which resource use, waste, energy emissions, and leakage are minimised by slowing down, closing, and narrowing material and energy loops. The aim is to reduce waste, reuse products, and close production chains. This approach is suitable for achieving environmental objectives.<sup>13</sup> Along these lines, the CE model is a basic strategy for transforming existing production and consumption patterns toward more environmentally friendly ones. The key areas here are the reduction of resource consumption, the increase in the reuse of resources, and the recovery of resources. Broadly, it is important to decouple economic growth and environmental degradation; that is, it is necessary to decouple resources (to use fewer resources per unit of economic output [GDP]) and impact (reduce the environmental impact of all resources used).<sup>14</sup>

To achieve the EU's goal of a CE, changes must be made to the Waste Framework Directive 2008/98/EC<sup>15</sup> (WFD), especially in relation to its requirements for planning such infrastructure systems. The CE should be closely linked to the efficiency of resource productivity and waste production.<sup>16</sup> In line with the proximity principle of the WFD, an integrated and adequate waste management system should be established at the national level.<sup>17</sup> In addition, the system should be designed to enable the whole community to become self-sufficient in waste disposal and recovery. The EU's legal tool to support the transition to a CE is the Waste Package, which includes the amendment of six waste management directives.<sup>18</sup> However, the effectiveness of the implementation of this concept is determined by the applicable legislative, technical, and organisational solutions in waste management, especially with regard to the closure and 'sealing' of this system.<sup>19</sup> The need to achieve a CE is also mentioned in the context of packaging waste management in Directive 2018/252,<sup>20</sup> which sets out measures to prevent the generation of packaging waste and to reuse, recycle, and otherwise recover packaging waste, thereby

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<sup>11</sup> For more, please see: Paleari 2022; Schunz 2022.

<sup>12</sup> European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Closing the loop - An EU action plan for the Circular Economy, COM(2015) 614 final.

<sup>13</sup> See footnote no. 3.

<sup>14</sup> Glowacki et al. 2019, 168; Karpus 2023, 4–5.

<sup>15</sup> Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, OJ EU 312, 2008 (WFD).

<sup>16</sup> Robaina, Villar & Pereira 2020, 12567; Domenech & Bahn-Walkowiak 2019, 12–13.

<sup>17</sup> WFD, Art. 16.

<sup>18</sup> Wilts and von Gries 2015, 168.

<sup>19</sup> For more, please see: Zębek & Zięty 2022

<sup>20</sup> Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste, OJ L 150, 14.6.2018.

reducing its final disposal, in order to support the transition to a CE. The issue of plastics in the EU is also being addressed in the European Strategy for Plastics in a Closed Economy (COM(2018) 28 final).<sup>21</sup> This strategy sets out a vision for a new plastics economy in Europe. In particular, an intelligent, innovative, and sustainable plastics sector that fully recognises the need for reuse, repair,<sup>22</sup> and recycling in design and manufacturing will increase economic growth and employment in Europe and reduce the EU's greenhouse gas emissions and dependence on imported fossil fuels. Increasing the durability of plastics and, in turn, plastic products can allow for reuse and high-quality recycling. By 2030, all plastic packaging placed on the EU market should be cost-effectively reused or recycled.

The new action plan for the CE sets out actions for a cleaner and more competitive Europe (COM(2020) 98 final).<sup>23</sup> The aim of this plan is to accelerate the transformational change required by the EGD, while building on the CE activities implemented since 2015. The plan will ensure that the regulatory framework is streamlined and adapted to a sustainable future and that it maximises the new opportunities arising from the transition, while minimising the burden on citizens and businesses. It sets out a series of interlinking initiatives to create a robust and coherent product policy framework that makes sustainable products, services, and business models the norm and changes consumption patterns to prevent waste. This policy framework will be introduced gradually, with priority given to key product value chains. Further measures will be introduced to reduce waste and ensure that the EU has a well-functioning internal market for high-quality secondary raw materials. Further, the EU's ability to take responsibility for its waste will also increase.

In Poland, these objectives are pursued through the implementation of EU provisions and regulations into national waste management and environmental legislation, including the Waste Act of 2012 (WL),<sup>24</sup> the Packaging and Packaging Waste Act (PPWA),<sup>25</sup> and the Act on Maintaining Cleanliness and Order in Communes of 1996 (MCOC),<sup>26</sup> among others. This article presents the legal status of the transition to a CE in Poland and related established legal instruments.

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<sup>21</sup> European Commission, A European Strategy for Plastics in a Circular Economy, COM(2018) 28 final.

<sup>22</sup> See: Terryn 2019, 872; Turiel 2021, 587; Zoll 2019, 149–155.

<sup>23</sup> European Commission, A new Circular Economy Action Plan for a cleaner and more competitive Europe, COM (2020) 98 final.

<sup>24</sup> Waste Law of 14 December 2012, consolidated text LJ of 2023, items 1587, 1597 (WL).

<sup>25</sup> Act of 13 June 2013 on packaging and packaging waste management, consolidated text LJ of 2023, items 1658, 1852 (PPWA).

<sup>26</sup> Act of 13 September 1996 r. on maintaining cleanliness and order in communes, consolidated text LJ of 2023, items 1469, 1852 (MCOC).

## 2. Considering Poland's waste management principles and legal instruments in the context of a circular economy

### 2.1. Basic principles of waste management

In Poland, the transition to a CE is particularly evident in the 2012 Waste Act, especially after the regulatory changes introduced by the Act of 17 November 2021.<sup>27</sup> This Act highlights the need to adapt CE guidelines in waste management. Notably, it sets out measures to protect the environment, life, and human health by preventing and reducing waste and its negative impacts, by reducing the overall impact of resource use, and by improving the efficiency of such use to give rise to a closed-loop economy.<sup>28</sup> Section II of the Act lays down general principles for waste management to protect human life and health and the environment. Specifically, it establishes that waste management shall not: (a) cause danger to water, air, soil, plants, or animals; (b) cause nuisance through noises or odours; or (c) negatively affect the landscape or places of special interest, including cultural and natural sites.<sup>29</sup> Key to this is the waste hierarchy, which establishes that waste should be managed in the following order: (1) waste prevention, (2) preparation for reuse, (3) recycling, (4) other recovery operations, and (5) disposal.<sup>30</sup> To prevent waste, measures should be taken to reduce: (a) the quantity of waste, including by reusing or extending the life of the product; (b) the negative environmental and human health impacts of the waste generated; and (c) the content of hazardous substances in materials and products.<sup>31</sup> Prevention of waste shall include at least: (1) promoting and supporting sustainable production and consumption patterns; (2) encouraging the design, production, and use of products that are resource-efficient, durable, repairable, reusable, and upgradable, and not artificially shortening the life cycle of products; (3) encouraging the reuse of products and the establishment of systems promoting their repair and reuse, especially for electrical and electronic equipment, textiles, furniture, packaging, and building materials and products; (4) promoting the availability of spare parts, manuals, technical information or other tools, hardware, or software that enable the repair and reuse of products without impairing their quality and safety, as long as this does not infringe upon intellectual property rights; (5) the reduction of waste generation in processes linked to industrial production, mineral extraction from deposits, manufacturing, construction, or demolition, considering the best available techniques; (6) reducing the generation of food waste in primary production, processing, and manufacturing; food retail and other distribution entities; food services, and households; (7) encouraging food donations and other forms of food redistribution, prioritising human use over reprocessing for animal feed or non-food products; (8) promoting the reduction of the content of hazardous substances in materials and products; (9) reducing the generation of waste, particularly that which is not suitable for

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<sup>27</sup> Act of 17 November 2021 r. amending the Waste Act and certain other acts, LJ of 2021, item 2151.

<sup>28</sup> WL, Art. 1.

<sup>29</sup> Ibid. Art. 16.

<sup>30</sup> Ibid. Art. 17. For more, please see: Zębek 2018, 235.

<sup>31</sup> Ibid. Art. 3(33)

preparation for reuse or recycling; (10) identifying products that are major sources of litter, especially in terrestrial and marine environments, and taking action to prevent and reduce the generation of waste from these products; (11) seeking to prevent the generation and release of waste into the marine environment; (12) developing and supporting information campaigns to raise awareness of waste prevention and littering.<sup>32</sup>

Notably, the principle of prevention is closely linked to the principle of waste precaution and of comprehensiveness, which considers the eventual significant reduction of waste. Thus, the aim of this principle is also to reduce the amount of waste and its toxicity in production processes and finished products. However, despite the use of recycling methods, waste management processes generate residual waste. Consequently, the principles of waste management need to be modified to make maximum use of this residual waste, which is what the CE aims to do.<sup>33</sup>

According to this hierarchy, waste management is mainly focused on waste recovery. In legal terms, the primary outcome of recovery is that the waste serves a useful purpose by replacing other materials that would otherwise be used to fulfil a function, or by which waste is prepared to fulfil such a function in a particular facility or in the economy.<sup>34</sup> Preliminary recovery is the preparation of waste for reuse involving checking, cleaning, or repair, whereby products or parts of products that have previously become waste are prepared so that they can be reused without any other pre-processing activity.<sup>35</sup> Mechanical-biological treatment methods for mixed municipal waste can be applied to some of the waste that is collected here.

The next stage of waste recovery is recycling; in this stage, waste is reprocessed into products, materials, or substances used for their original purpose or other purposes. Recycling also includes the reprocessing of organic material (organic recycling) but does not include energy recovery and reprocessing into materials to be used as fuels or for earthworks.<sup>36</sup> Organic recycling consists of the aerobic treatment of waste (including composting) or the anaerobic treatment of waste (involving biological decomposition under controlled conditions using micro-organisms, resulting in the production of organic matter or methane). It should be mentioned that landfilling is not considered organic recycling. Polish legislation in the context of CE also distinguishes material recovery, which involves reprocessing waste into materials that can be used as fuels or other means of energy production. This recovery includes preparation for reuse, recycling, and earthworks.<sup>37</sup> Finally, energy recovery through the thermal treatment of waste is also distinguished.<sup>38</sup> The last step in the waste hierarchy is disposal, which should only apply to non-recoverable waste; it is carried out by thermal waste treatment or landfilling. According to the proximity principle, taking into account the waste hierarchy, waste is treated first at the place where it is generated.<sup>39</sup>

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<sup>32</sup> Ibid. Art. 19a.

<sup>33</sup> Korzeniowski 2014, 212.

<sup>34</sup> WL, Art. 3(14)

<sup>35</sup> Ibid. Art. 3(22)

<sup>36</sup> Ibid. Art. 3(23)

<sup>37</sup> Ibid. Art. 3(15a)

<sup>38</sup> Ibid. Art. 3(15)

<sup>39</sup> Ibid. Art. 20.

An additional legal tool in the transition to a CE is the option of the loss of status. This is because certain types of waste cease to be waste if, as a result of recycling or other recovery operations, they fulfil the following relevant requirements: (a) an object or substance used for a specific purpose, (b) an object or substance for which a market or demand exists, (c) an object or substance that fulfils the technical requirements for its use for the specific purpose and meets the requirements set out in the legislation applicable to the object or substance concerned and the standards applicable to the product (especially chemicals), (d) the use of the object or substance does not lead to detrimental effects on life, human health, or the environment.<sup>40</sup>

## 2.2. Waste management obligations of public authorities and enterprises

Legislation on waste management has laid down appropriate rules. It also imposes many obligations on waste holders. For example, waste holders must ensure the proper planning, design, and implementation of activities that generate waste, including production methods or forms of service, raw materials, and materials that primarily prevent or reduce waste and its negative impacts on human life and health and the environment. This applies to all stages during the manufacturing of a product.<sup>41</sup> Waste that has not been prevented shall be recovered as a priority by the waste holder; specifically, 'recovery' is the first stage of preparation for reuse or recycling by the holder of the waste or, where this is not technically possible or justified on environmental or economic grounds, other recovery operations. If necessary to ensure recovery, the waste holder shall remove hazardous substances, mixtures, and components from the hazardous waste before or during recovery. Further, the waste holder shall dispose of waste that cannot be recovered. The only type of waste that should be stored is waste that cannot be disposed of by other means. Disposal shall be provided for waste from which recoverable waste has previously been separated out.<sup>42</sup> In waste management, the institution of extended producer responsibility (EPR) plays an important role, significantly changing the subjective scope of responsibility for waste. This has far-reaching implications for the specific part of waste law dealing with the rationalisation of waste management and not just the general principles of environmental law.<sup>43</sup> The transition to a CE, therefore, challenges businesses to prevent waste, use by-products directly, use renewable energy sources, and offer products that can be easily repaired, refurbished, or modified and thus reused. The range of activities implemented by companies includes: (1) sustainable business models based on CE principles, (2) eco-design practices, and (3) eco-innovation.<sup>44</sup>

The Polish legal system also imposes certain obligations on public administrations regarding recycling. Public authorities are obliged to take all measures to promote reuse or to prepare for the reuse of waste; in particular, they must encourage the establishment

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<sup>40</sup> Ibid. Art. 14.

<sup>41</sup> Ibid. Art. 18.

<sup>42</sup> For more information on waste management methods, please see: Zębek & Raczkowski 2014; Zębek, Szwejkowska & Raczkowski 2015, 652–658.

<sup>43</sup> See: Karpus 2021, 111–126.

<sup>44</sup> Pichlak 2018, 338; Pink & Wojnarowska 2020, 125–128; Gralak 2021, 32.

of reuse and repair networks and provide economic incentives. In addition, public finance entities shall apply the criteria for the reuse or preparation for reuse of waste when awarding public contracts.<sup>45</sup> To adapt the CE in Poland, the 1996 Act on Maintaining Cleanliness and Order in Municipalities established an appropriate system of selective waste collection, including paper, metals, plastics, glass, multi-material packaging waste, and biowaste, which is recycled. In addition, separated fractions from mixed municipal waste are recovered at municipal facilities. This involves the installation of the treatment of non-segregated (mixed) municipal waste or residues from the processing of such waste as per the requirements of the best available technique. Specifically, this involves: (1) the mechanical-biological processing of mixed municipal waste and its separation from fractions suitable in whole or in part for recovery, or (2) the storage of waste generated in the process of the mechanical and biological processing of mixed municipal waste and of residues from the sorting of municipal waste.<sup>46</sup>

There is also an obligation on municipalities to achieve appropriate levels of waste recovery and recycling. Specifically, municipalities are required to achieve the following levels of preparing for reuse and recycling of municipal waste: 35% in 2023, 45% in 2024, 55% in 2025, 56% in 2026, 57% in 2027, 58% in 2028, 59% in 2029, 60% in 2030, 61% in 2031, 62% in 2032, 63% in 2033, 64% in 2034, and 65% in 2035 and beyond. In addition, they are obliged not to exceed a landfill level of 30% from 2025–2029, 20% from 2030–2034 and 10% from 2035 onwards.<sup>47</sup>

In the transition to the CE, packaging waste management is an important issue. Indeed, the Packaging and Packaging Waste Management Act of 2013 sets out the obligations of businesses introducing, supplying, distributing, and exporting packaging waste and packaged products as well as those recovering and recycling packaging waste. The purpose of the Act is to reduce the quantity and environmental harmfulness of materials and substances contained in packaging and packaging waste at the production, marketing, distribution, and processing stages, especially through the manufacturing of clean products and the use of clean technologies. The Act sets out the requirements to be met by packaging placed on the market, principles for packaging recovery organisations, and principles for handling packaging and packaging waste.<sup>48</sup> Plastic packaging, such as oxo-degradable plastic shopping bags, are subject to special regulations.<sup>49</sup> The producer of packaging is obliged to limit the quantity and negative environmental impact of substances used for the production of packaging and the packaging waste generated to ensure that (1) packaging does not contain harmful substances in quantities that pose a risk to the product, the environment, or human health and (2) the maximum sum of lead, cadmium, mercury, and hexavalent chromium in the packaging does not exceed 100 mg/kg. Additionally, the producer is also obliged to reduce the volume and negative environmental impact of substances used in the production of packaging and packaging waste. In doing so, it must ensure that the volume and weight of the packaging are reduced to the minimum necessary to fulfil the function

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<sup>45</sup> WL, Art. 19.

<sup>46</sup> Ibid. Art. 35(6)

<sup>47</sup> MCOC, Art. 3b.

<sup>48</sup> PPWA, Art. 1.

<sup>49</sup> Ibid. Art. 8a.



of the packaging and ensure the safety of the product, taking into account the expectations of the user. Furthermore, it should market packaging designed and manufactured in such a way that it can be reused and then recycled, if reuse is not possible, or recovered by means other than recycling if recycling is not possible.<sup>50</sup>

Reusable packaging waste should be recovered under conditions that meet the health and safety requirements for recyclable packaging. Packaging subjected to specific types of recovery must meet the following requirements: (1) regarding recycling, the packaging must have been manufactured in such a way that a certain percentage by weight of the material from which the packaging is made can be recycled; (2) regarding composting, the packaging must have a biodegradability level that does not impede separate collection of such bio-packaging, composting processes, or other operations to which they are submitted; (3) regarding biodegradability, the packaging must have the capacity to decompose physically, chemically, thermally, and biologically and the ultimate decomposition of the resulting compost into carbon dioxide, biomass, and water must be ensured; (4) regarding energy, the packaging have a minimum lower calorific value to optimise energy recovery.<sup>51</sup>

In Poland, there is a niche market for bio-based packaging, including compostable packaging. It is estimated that in 2018, the share of biodegradable packaging was only 2%. There is a need to support the development of bio-packaging supply chains to strengthen the potential and competitiveness of Polish companies on the international and global market. Bio-packaging supply chains are mainly co-produced by suppliers of natural raw materials and biopolymers, producers and distributors of bio-packaging, producers of finished products, and consumers.<sup>52</sup>

Notably, Polish law introduced requirements for producers of beverage packaging; that is, producers of disposable plastic bottles of three litres or less. Specifically, these producers must ensure that such packaging, including plastic caps and lids, contains at least: (1) from 2025, 25% recycled plastic if the main component is polyethylene terephthalate; (2) from 2030, 30% recycled plastic.<sup>53</sup>

### **3. Considering Poland's system of legal and economic waste management instruments in the context of a circular economy**

#### **3.1. Legal instruments of waste management**

Polish legislation has established legal instruments to implement the previously described principles and hierarchy of waste management and to ensure that waste is handled in accordance with environmental law. These include: (a) waste management plans, (b) a waste collection and treatment permit and registration system, and (c) a waste evidence system. Waste management plans are intended to achieve the objectives set out in environmental policy and decouple the trend in the growth of waste generation and its impact on the environment from the trend in national economic growth. In addition,

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<sup>50</sup> Ibid. Art. 11.

<sup>51</sup> Ibid. Art. 12.

<sup>52</sup> Brzeziński et al. 2022, 27–28.

<sup>53</sup> PPWA, Art. 14a.

these plans support the implementation of the waste hierarchy and the principle of self-sufficiency and proximity, as well as the creation and maintenance of an integrated and sufficient network of waste management facilities in the country, meeting the requirements of environmental protection.<sup>54</sup> These plans cover waste generated in the area at national and provincial levels, including municipal waste, biodegradable waste, packaging waste, and hazardous waste. They also include the previously described waste prevention measures. Further, the plans contain analyses of the current state of waste management in the area, including information on: (1) waste types, quantities, and sources; (2) waste subjected to particular recovery and disposal processes; (3) waste management problems, such as existing waste collection systems and measures to improve their functioning, measures to prevent the placement of recyclable waste in landfills, and rates of municipal waste going to energy recovery processes; (4) waste management policies, including the technologies and methods planned for their implementation; measures to improve (from an environmental point of view) the preparation for the reuse, recycling, and non-recycling recovery and disposal of waste; measures to encourage the separate collection of biowaste for composting, digestion, or other treatment that offers a high level of environmental protection; and the use of environmentally safe materials produced from biowaste capable of protecting human life and health and the environment.<sup>55</sup>

Other legal instruments include waste collection and treatment permits, which have a rationing function. This rationing enables the stable regulation of waste handling; in particular, the primary function of these instruments should be the prevention of waste. The implementation of the preventive function of legal instruments in waste management should also be the result of a comprehensive approach to waste management designed to significantly reduce waste.<sup>56</sup> Another ~~form~~ instrument is registration, which applies to entities that: (a) introduce products and packaged products, (b) operate retail or wholesale units where plastic shopping bags are offered, (c) manage waste, and (d) are entrepreneurs.<sup>57</sup> These entities are also obliged to report on their products, packaging, and management of related waste in their annual reports.<sup>58</sup> It is also worth mentioning that waste holders are obligated to keep separate quantitative and qualitative records for each type of waste.<sup>59</sup>

The transformation of the CE is also already visible in Polish jurisprudence, particularly with judgements in relation to inappropriate methods of waste management, which, according to the guidelines of this system, should be aimed at reuse (i.e. the recovery and recycling of waste). The judgements allege that there are insufficient preparatory processes for the recovery of waste; for example, glass cullet cannot be classified as recycling, making it impossible to classify the cullet as a recycling material.<sup>60</sup>

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<sup>54</sup> WL, Art. 34.

<sup>55</sup> Ibid. Art. 35.

<sup>56</sup> Korzeniowski 2014, 27.

<sup>57</sup> WL, Art. 49.

<sup>58</sup> Ibid. Art. 77.

<sup>59</sup> Ibid. Art. 66. See: Zębek 2018, 258–260.

<sup>60</sup> Judgment of the Provincial Administrative Court in Warsaw, IV SA/Wa 857/21, LEX no. 3318691.

Another case concerns waste treatment facilities (for recovery and disposal) that do not meet the technical requirements for methods of preparing waste for recovery and do not follow the waste hierarchy, such as facilities for the separation of secondary raw materials from selective collection and packaging from trade and industry, as well as associated infrastructure. The waste treatment hierarchy assumes that there are higher-level waste treatment options (waste prevention, preparation for reuse, recycling) and management options (which are subordinate to the higher treatment options). Subsequent waste treatments must be compatible (non-contradictory) with the higher treatment options in the hierarchy and designed to achieve the objectives of the CE model.<sup>61</sup>

### 3.2. Financial waste management instruments

Economic and other instruments are used to create incentives for the waste hierarchy. Examples of economic instruments and other measures to encourage the waste hierarchy are set out in the WL. These include: (1) charges for and restrictions on the use of landfill and incineration to encourage waste prevention and recycling, retaining landfill as the least desirable waste management method; (2) proportionate waste levy schemes on waste generators based on the actual amount of waste generated and designed to encourage the separation of recyclable waste at the source and the reduction of mixed waste; (3) tax incentives for free product donations, especially food donations; (4) EPR schemes for different types of waste and measures to improve their efficiency, profitability, and management. This system is established to ensure that producers of products, including packaged products, are financially and organisationally responsible at the life cycle stage of the product when it becomes waste; (5) deposit return schemes and other measures to encourage the efficient collection of used products and materials; (6) sustainable public procurement to encourage better waste management and the use of recycled products and materials; (7) the gradual removal of surcharges incompatible with the waste hierarchy; (8) the use of fiscal or other measures to promote the use of products and materials prepared for reuse or recycling; (9) encouraging research and innovation on advanced recycling and product remanufacturing technologies; (10) the use of the best available waste treatment techniques; (11) economic incentives for local and provincial government bodies, especially to promote waste prevention and the expansion of separate collection systems, without promoting landfilling and incineration.<sup>62</sup>

## 4. Legislative and organisational measures involved in the transition to a circular economy in Poland

In Poland, the Roadmap for Transformation to a Circular Economy<sup>63</sup> was adopted in 2019. This plan includes a set of tools to create conditions for the implementation of

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<sup>61</sup> Judgment of the Provincial Administrative Court in Warsaw, IV SA/Wa 1816/20, LEX no. 3161881; Judgment of the Supreme Administrative Court, II OSK 2525/17, LEX no. 2739886.

<sup>62</sup> WL, Annex 4a.

<sup>63</sup> Resolution 136/2019.

the new economic model. Notably, the tools are not only legislative. The plan is one of the projects of the Strategy for Responsible Development, which contains five chapters:

Chapter 1, 'Sustainable industrial production', is intended to draw attention to the important role of industry in the Polish economy and to new opportunities for its development. Indeed, there is great potential for improvement in Poland with regard to the management of industrial waste, especially from mining and quarrying, industrial processing, and energy production and supply. Conducting production activities that generate less waste and managing as much industrial waste from these activities as possible in other production processes and sectors of the economy can significantly increase the profitability of production in Poland and reduce its negative impact on the environment. Also highlighted here is the aspect of EPR, an approach that obliges the producer to collect and manage the waste generated from the same products it puts on the market. This chapter also analyses the Environmental Life Cycle Assessment, an approach to assessing the environmental impact of a product or business activity.

Chapter 2, 'Sustainable consumption', shows how much potential there is in this historically overlooked stage of the life cycle. Sustainable consumption is a style of consumption that satisfies basic human needs while minimising the use of natural resources and reducing waste and emissions. Measures aimed at consumers as part of the CE transition include ensuring the availability of repair and spare parts information, better enforcement of warranties, eliminating false claims about environmental impact, or determining the maximum shelf life of a product without harming the consumer or the environment. This framework analyses three aspects: (1) Municipal waste: the framework outlines that the creation of an economy that fully realises the CE approach will require intensified efforts to prevent the generation of and manage as much municipal waste as possible through recycling. The latter requires that waste be collected separately and is of good quality (the quality of municipal waste consists in particular of its cleanliness, understood as not being contaminated with other types of waste); (2) Food waste: the framework assumes that the separate collection of food waste and its management in facilities suitable for this purpose is an essential part of waste management; (3) Education: the framework cites education as crucial for the success of the transition toward the CE.

Chapter 3, 'Bioeconomy', deals with the management of renewable raw materials, which hold great potential in Poland. The circular bioeconomy is the biological cycle in the economy. Notably, the biological cycle is one of the two pillars of the CE, along with the technological cycle. In the CE, the biological cycle is related to the management of renewable resources (so-called 'biomass') throughout their life cycle; that is, across their processing, the production of goods (e.g. food, feed, bioenergy), the sale of goods, the use phase, and the management of biowaste. The bioeconomy provides the basis for the functioning of the primary sector of the economy, which consists of agriculture, forestry, and fisheries, as well as many secondary sectors, including food, feed, forestry and wood, pulp and paper, pharmaceuticals, textiles, furniture, construction, biotechnology, cosmetics, fuel, and organic recycling industries. The CE Roadmap focuses, on the one hand, on general actions to create conditions for the development of the bioeconomy in Poland. On the other hand, it focuses on actions related to the development of the bioeconomy in selected areas; that is, in the creation of local value chains, in industry, and in the energy sector.

Chapter 4, 'New business models', identifies opportunities to re-engineer the ways in which different market players operate based on the idea of the CE. The transformation toward the CE requires a re-engineering of the operating model of virtually all market participants, including businesses, public institutions, and consumers. The corporate business model consists of the following elements: key partners/suppliers, key activities, key resources, customer relationships, distribution channels, customer segmentation, costs, and revenues.

Chapter 5 'Monitoring system', deals with the implementation and monitoring of the CE. Monitoring the CE is a major challenge due to the complexity of the CE concept itself; specifically, the CE encompasses policies across many different areas and their interdependencies and has a multidimensional impact on national socio-economic development. Therefore, the CE Roadmap specifically outlines an action for developing a conceptual approach to such monitoring in Poland. The activities detailed in this chapter are shown in Table 1.

| Chapter                                  | Activities  |
|--|---|
| <b>Sustainable industrial production</b> | <p data-bbox="502 774 1174 826"><b>Management of waste from mining, processing, and energy industries</b></p> <ul style="list-style-type: none"> <li data-bbox="550 832 1174 884">– Analyse the potential of and proposals for legislative changes to increase the economic use of combustion by-products;</li> <li data-bbox="550 890 1174 996">– Provide guidelines for Waste-Free Coal Power Generation to minimise the environmental nuisance associated with coal mining and the generation of electricity and heat from coal combustion;</li> <li data-bbox="550 1002 1174 1054">– Conduct feasibility study for the creation of a dedicated platform for recyclable materials;</li> <li data-bbox="550 1060 1174 1190">– Analyse the potential for opening up and utilising waste heaps from the processing and extractive industries and of the morphological composition of extractive waste and the possibilities of its utilisation in individual branches of Polish industry, as well as proposing legislative changes on this basis.</li> </ul> <p data-bbox="502 1215 550 1240"><b>EPR</b></p> <ul style="list-style-type: none"> <li data-bbox="550 1246 1174 1406">– Review the regulations on packaging, end-of-life vehicles, waste electrical and electronic equipment, tyres, batteries and accumulators, and lubricating oils and lubricating preparations; additionally, the development of proposals to amend Polish regulations to bring them in line with the requirements of EU law and steer their transformation toward the CE;</li> <li data-bbox="550 1412 1174 1489">– Analyse strengths, weaknesses, opportunities, and threats in EPR control and reporting and develop proposals to address deficiencies in this area;</li> <li data-bbox="550 1495 1174 1547">– Conduct awareness campaign on the benefits of EPR for business image.</li> </ul> <p data-bbox="502 1572 889 1597"><b>Life Cycle Environmental Assessment</b></p> <ul style="list-style-type: none"> <li data-bbox="550 1603 1174 1711">– Develop information and education material on calculating the environmental impact of products and economic activities, based on methodologies developed by the European Commission (i.e. Product Environmental Footprint Category</li> </ul> |

|                                       |  |
|---------------------------------------|--|
|                                       | <p>Rules and Organisation Environmental Footprint Sector Rules)</p>  |
| <p><b>Sustainable consumption</b></p> | <p><b>Municipal waste</b></p> <ul style="list-style-type: none"> <li>- Monitor the effectiveness and efficiency of current regulations and develop recommendations for adapting and amending national municipal waste legislation;</li> <li>- Prepare proposals for hazardous waste legislation;</li> <li>- Identify all municipal waste streams, including post-consumer waste, not yet accounted for but of economic importance and related to achieving recovery and recycling targets in waste management;</li> <li>- Food waste</li> <li>- Conduct information campaign to raise awareness among consumers and producers on how to prevent food waste;</li> <li>- Develop a concept for distribution mechanisms and appropriate handling of products with a minimum shelf life;</li> <li>- Develop a concept for a system of incentives and obligations for entrepreneurs to counter food waste;</li> <li>- Conduct periodic statistical studies on the scale, structure, and direction of food waste processes in Poland.</li> <li>- Education</li> <li>- Develop a concept for a government information platform on CE;</li> <li>- Conduct a public campaign on sustainable consumption patterns.</li> </ul>            |
| <p><b>Bioeconomy</b></p>              | <p><b>Key actions in the area of creating conditions for the development of the bioeconomy</b></p> <ul style="list-style-type: none"> <li>- Establish a permanent team among heads of departments from ministries responsible for particular areas of the bioeconomy and appoint a coordinator of this team, define directions for bioeconomy development, supervise the implementation of tasks in particular areas, and improve the flow of information between ministries;</li> <li>- Review existing regulations and create uniform requirements/standards for biomass;</li> <li>- Analyse biomass supply potential at national and regional levels, preceded by the development of an appropriate methodology;</li> <li>- Identify research, development, and innovation priorities for the development of the bioeconomy in Poland.</li> </ul> <p><b>Activities in the area of building local value chains and the raw material base</b></p> <ul style="list-style-type: none"> <li>- Feasibility study for the creation and development of local biorefineries;</li> <li>- Awareness campaign for farmers to increase their knowledge and guide them toward CE.</li> <li>- Activities in the field of energy</li> </ul> |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>- Conduct information campaign on the principle of biomass cascading;</li> <li>- Analyse barriers to the use of advanced biofuels in transport.</li> </ul> <p><b>Activities in the area of industry</b></p> <ul style="list-style-type: none"> <li>- Conduct information campaign on products made from biomass;</li> <li>- Establish norms and standards for specific categories of biomass products;</li> <li>- Develop a concept for an information platform on the current quantity, quality, location, and source (agriculture, forestry, fisheries, biowaste, biomass);</li> <li>- Establish a working group with entrepreneurs to develop a concept and create a bio-economic development cluster.</li> </ul>  |
| <b>New business models</b>                     | <p><b>To create the right conditions for CE business models, the following activities are proposed:</b></p> <ul style="list-style-type: none"> <li>- Analyse the feasibility of changes to the tax system that would enable CE business models to become more competitive;</li> <li>- Develop a proposal for the legal regulation of the sharing and co-sharing of immovable and movable property, especially in relation to the regular short-term rental of vacant residential space and the carriage of persons;</li> <li>- Analyse the feasibility of introducing reporting and inspection concessions for entities applying environmental standards (e.g. EU Eco-label, EMAS, ISO) and entities in the Polish Register of Cleaner Production and Responsible Entrepreneurship;</li> <li>- Develop proposals for changes in public procurement law;</li> <li>- Develop a concept for an ecosystem of support for businesses based on CE business models;</li> <li>- Develop guidelines for enhancing the role of CE in economic clusters for the circulation of raw materials and waste from specific industries, including process industries;</li> <li>- Establish a connected automated driving focal point for road transport automation;</li> <li>- Develop a concept for the creation of a nationwide multi-industry online platform for product lending and the sharing of low-frequency products;</li> <li>- Establish a national intelligent specialisation for CE;</li> <li>- Develop a system of incentives for universities to introduce CE issues into research and teaching programmes;</li> </ul> |
| <b>Implementation and monitoring of the CE</b> | <ul style="list-style-type: none"> <li>- Implement the 'oto-CE' project (Gospostateg). The aim of the 'oto-CE' project is to develop two methodologies to assess progress in the transformation toward CE in Poland and to evaluate the impact of CE on socio-economic development at the meso-economic (regional) and macro-economic (national economy) levels.</li> </ul>  |

Table 1. Actions for the responsible development strategy

The state of Poland's transition to a CE can be analysed using the monitoring indicators proposed by the European Commission,<sup>64</sup> which can be grouped into the following four areas: (1) production and consumption, (2) waste management, (3) secondary raw materials, and (4) competitiveness and innovation. This analysis shows that the Polish economy is among the top ten EU economies that consider indicators for municipal waste generation per capita in the EU, such as the circular material use indicator, which is defined as the ratio of circular material use to domestic material consumption, the amount of private investment in the CE sector, and the number of jobs in these sectors relative to total jobs.<sup>65</sup>

## 5. Conclusions

The CE concept assumes that all parts of the production chain – products, materials, and raw materials – should remain in circulation for as long as possible. Waste generation should be kept to a minimum. Therefore, the transition to a CE model requires appropriate measures to be taken at all stages of a product's life cycle, starting with the acquisition of raw materials, through design, production, consumption, to waste collection and management. The implementation of the CE concept is not possible without organisational, process, and product innovation. The transition to a closed-loop economy is currently a priority objective for EU Member States, including Poland. In line with the 8th EAP and the guidelines within it, the EGD, the communications of the European Commission, and the amendments to the WFD by Directive 2008/98/EC, Poland is adapting its waste management principles<sup>66</sup> to strive for the maximum use of raw materials while limiting the amount of waste generated. This is reflected in regulatory changes to a number of acts, especially the Act on Waste, Packaging, and the Maintenance of Cleanliness and Order in Municipalities (the overall aim of which is to move toward a CE). An analysis of this legislation shows that measures have been developed to protect the environment and human life and health by preventing and reducing waste (thus reducing its negative impacts) and improving the efficiency of environmental resource use (thus reducing the demand for these resources). Management then becomes resource efficient and promotes the protection of environmental elements in terms of both quantity and quality. In particular, waste management must align with the waste hierarchy set out in the WFD, which aims to maximise recovery (material recycling, organic recycling, energy recovery), leaving only waste fractions that cannot be recovered for disposal. The loss of waste status has also been introduced for those fractions that are recycled and, at the same time, become secondary raw materials for further use, thus helping maintain an appropriate level of recovery.

Another aspect favouring the transition to a CE is the commitment of public administrations and economic operators to take appropriate measures in this direction.

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<sup>64</sup> European Commission, Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Circular Economy Action Plan, COM(2019) 190 final.

<sup>65</sup> Kulczycka 2018, 85.

<sup>66</sup> See also: Hopej-Malinowska 2023, 25–28; Bándi 2022, 18–73; Olajos & Mercz 2022, 79–82.



This applies in particular to the introduction of an effective selective waste collection system and the establishment of mixed municipal waste treatment facilities aimed at separating and preparing waste for recovery. In this way, the recycling of materials and organic substances takes place via two routes, that is, from selectively collected and non-segregated waste, which increases the efficiency of the system. In addition, an EPR system has been introduced for different types of waste along with legal and economic measures to prevent waste and improve its efficiency and management. Legislative measures include the promotion of sustainable production and consumption patterns, the use of sustainably repairable products, and other incentives. In particular, Polish legislation has focused on the recovery of plastic waste to reduce the amount of plastic microbeads in the environment. This issue is currently being widely analysed, particularly in relation to microplastics entering surface and groundwater, which is often a source of drinking water. However, the system needs to strengthen the management of biodegradable litter. In addition, both local authorities and operators are required to achieve appropriate levels of recovery and recycling, which will be increased over the years. Supporting instruments for the implementation of the CE are waste management planning, a system of permits for waste generation, collection and processing, and record keeping and reporting.

Finally, Poland has developed a roadmap for the transformation to a CE, which includes a set of legislative and organisational tools to create conditions for the implementation of the new economic model. These measures target activities in sustainable industrial production, sustainable consumption, the bioeconomy, new business models, and the implementation and monitoring of the CE. Poland's priorities within the CE include: (1) innovation and strengthening cooperation between industry and the scientific sector to facilitate the implementation of innovative solutions in the economy; (2) creating a European market for secondary raw materials to facilitate their movement; (3) ensuring high-quality secondary raw materials resulting from sustainable production and consumption; and (4) developing the services sector. When assessing Poland's legislative and organisational activities for the transition to the CE, they should be considered at a high level and in line with EU guidelines. This is evidenced by the fact that the Polish economy is among the top ten EU economies in terms of CE monitoring indicators. In the coming years, this can significantly contribute to creating a resource-efficient economy and reducing the amount of waste generated. Ultimately, this will enhance the sustainability and protection of environmental resources, which will undoubtedly have an impact quality of life and economic development.

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