

# THE NORWEGIAN DEPOSIT RETURN SCHEME (DRS)

PLAST  
ICENE

The role of humans in the life of plastic

# PROJECT REPORT

## PLASTICENE – The Norwegian Deposit Return Scheme (DRS)

This report investigates the effectiveness of the Norwegian DRS by using the waste hierarchy as a means of discussing waste management strategies such as prevention, reduction, reuse, and recycling.

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### AUTHORS

Juni S. Skogseth, Deloitte Norway

Sara L. Adielsson, Deloitte Norway

Mia C. Bratz, Deloitte Norway

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### ABSTRACT

The article does not aim to find a golden bullet solution but rather explore the advantages and disadvantages from different perspectives and achieve a better understanding of the possibilities for a circular value chain for plastic bottles in Norway.

PREPARED BY : Mia Caroline Bratz

APPROVED BY : Anders Magnus Løken

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PLASTICENE is a project funded by the Norwegian Research Council. It consists of four partners – SINTEF (represented by SINTEF Ocean, SINTEF Industry, SINTEF Community and SINTEF Helgeland), Deloitte, WWF Norway, and House of Knowledge – and is coordinated by SINTEF Ocean. The project takes a full life-cycle approach to building new knowledge and addressing important processes for increased plastic circularity and effective plastic waste management, with the aim of supporting improved plastic material utilization and protecting the environment from plastic pollution.

This is critical, as more than 460 million tons of plastic are produced globally every year as of 2019<sup>1</sup>. Plastic waste and emissions of plastic to nature represent significant societal challenges, and increased knowledge of the plastic resource flow is essential. The regulatory landscape for plastics governance in Norway and abroad is fragmented though, and nested within multiple layers of overlapping global, regional, local and industry-focused initiatives aimed at curbing the flow of plastics to the environment and ensuring circulari

# PLASTICENE

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<sup>1</sup> OECD. 2023. Global plastic waste set to almost triple by 2060. Available at: <https://www.oecd.org/environment/global-plastic-waste-set-to-almost-triple-by-2060.htm>

## 1. INTRODUCTION

The Norwegian Deposit Return Scheme (DRS) is often referred to as one of the world's leading systems for the recovery and recycling of beverage containers.<sup>2,3</sup> The current DRS is a single-use system where beverage containers go through material recycling including processes such as compression, shredding, melting and production of new beverage containers. The DRS aims to keep beverage containers in the loop through an environmental tax, a convenient return infrastructure, and a deposit value that incentivizes consumers to return their empty containers.<sup>4</sup> Norwegians return over one billion plastic and aluminum bottles and cans every year, and through collaborative efforts between consumers, retailers, and producers, a collection rate above 95 % has been achieved since 2011.<sup>5</sup> When the collection rate exceeds 95%, the environmental tax is eliminated, providing a strong incentive for producers to strive for a high collection rate. Most of the beverage containers in Norway are handled by Infinitum, which serves as both the Central System Administrator and the Producer Responsibility Organization (PRO). The Norwegian DRS scheme is regulated through the Waste Regulation (avfallsforskriften), which defines requirements for recycling and handling of waste in Norway.<sup>6</sup>

This report investigates the effectiveness of the Norwegian DRS by using the waste hierarchy as a means of discussing waste management strategies such as prevention, reduction, reuse, and recycling. The Norwegian system is mainly based on recycling and is well-known for its effectiveness and high collection rates. The system is now being challenged by the EU's new requirements<sup>7</sup> for reusable packaging, meaning a reintroduction of return, washing and reuse of beverage bottles. It is contested if this is the best solution for countries with already established DRS in terms of environmental impacts. While the Norwegian system has shown effectiveness in various aspects, its impact on reducing plastic bottle usage and curbing the consumption of virgin plastic is more limited. To evaluate the effectiveness of today's DRS, the various waste strategies will be presented before a discussion of the effectiveness considering today's urgent need to reduce plastic consumption substantially. The article does not aim to find a golden bullet solution but rather explore the advantages and disadvantages from different perspectives and achieve a better understanding of the possibilities for a circular value chain for plastic bottles in Norway.

## 2. IMPLEMENTATION AND ORGANIZATION OF THE NORWEGIAN DRS

Norway has been at the forefront of implementing a Deposit Return System (DRS), with an early system for reusable glass containers introduced as far back as 1902. Initially, this system operated on a voluntary basis, with producers collecting and reusing beverage bottles after thorough washing and refilling. While this approach allowed for multiple reuse cycles, it required transportation and washing processes for each cycle.<sup>8</sup> In the 1970s, Norway introduced reverse vending machines, automating the return process for refillable glass bottles. Subsequently, in 1999, the country implemented a DRS for single-use PET bottles and aluminum cans. This implementation was motivated by the vision of establishing a packaging system that prioritized recyclability, allowing containers to be compressed upon return. To support the DRS, the Norwegian Environment Agency developed a national regulation for a DRS system which received approval in 1995. This led to the establishment of the PRO Norsk Resirk in 1996, today known as Infinitum.

<sup>2</sup> [Why does TOMRA claim Norway's deposit return scheme is one of the best in the world? | Article | Packaging Europe](#)

<sup>3</sup> [Norway Product Control Act. \(1999\) on the Recycling of Plastic and Metal Beverage Bottles - Global Plastics Policy Centre \(port.ac.uk\)](#)

<sup>4</sup> <https://www.tomra.com/en/reverse-vending/media-center/feature-articles/norway-deposit-return-scheme>

<sup>5</sup> [infinitum\\_a-rsrapport\\_2022\\_web-6.pdf](#)

<sup>6</sup> [Forskrift om gjenvinning og behandling av avfall \(avfallsforskriften\) - Lovdata](#)

<sup>7</sup> [New EU rules to reduce, reuse and recycle packaging | News | European Parliament \(europa.eu\)](#)

<sup>8</sup> [Review of life cycle assessments of reuse systems for bottles - Norsus](#)

TOMRA: An important part of the solution was the already established reverse vending machine systems from the Norwegian company TOMRA. The first reverse vending machine was created in 1970 and it was installed in Oslo in 1972. By 1996 TOMRA was an international corporation and had efficient reverse vending machine systems in 34 different countries. Norway's new DRS system was inspired by TOMRA as well as other countries, such as Sweden, which had successfully increased their return rate by implementing a deposit rate on each beverage bottle.<sup>9</sup>

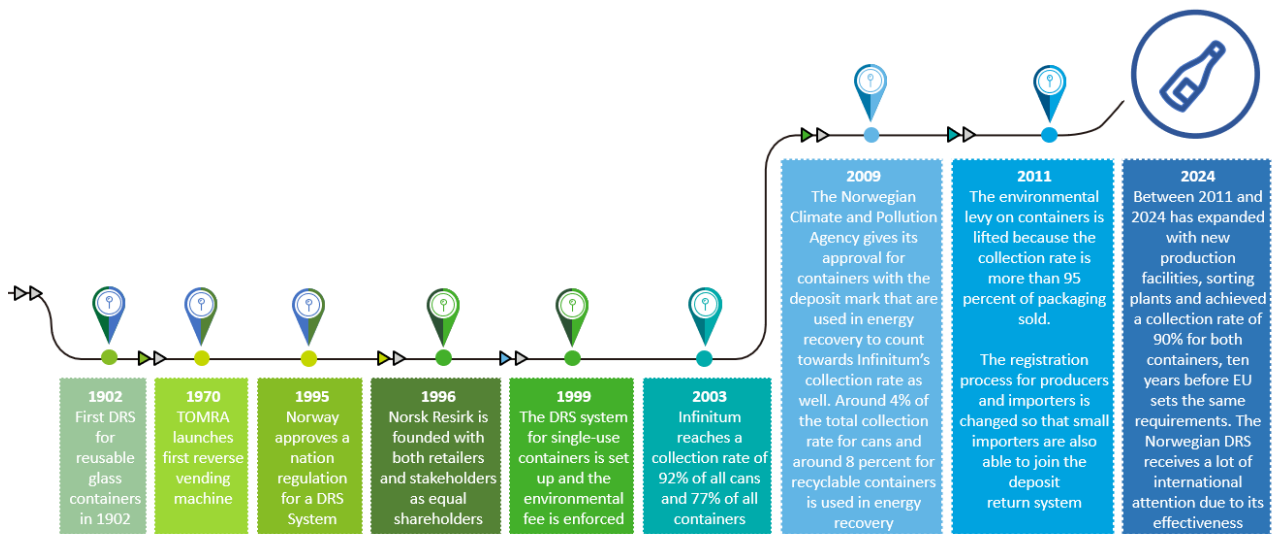


Figure 1: Norwegian DRS timeline: [infinitem annualreport 2022 pages.pdf](https://www.infinitem.no/2022/06/2022-årsrapport/)

## 2.1 THE WASTE REGULATION

The Norwegian Waste Regulation regulates the DRS for beverage packaging with the purpose of promoting an effective system with a high recovery rate. Recovery is in the regulation defined as reused, recycled or energy recovered.<sup>10</sup> The regulation requires producers to work towards waste prevention and design products for reuse and recycling. The packaging design must comply with the standards published in the Official Journal of the European Union and the national standards from the EU Commission.<sup>11</sup> According to the Waste Regulation, all producers and importers of beverages must be a part of an approved return system. This does not necessarily mean Infinitem, it can also be other PROs such as Norsirk or Grønt Punkt Norge.<sup>12</sup> Any entity can join or set up a DRS, but the Norwegian Environment Agency determines if a take-back system is approved.

<sup>9</sup> [Emballasje til drikkevarer : miljø- og ressursmessige forhold \(nb.no\)](https://www.miljodirektoratet.no/tema/emballasje-til-drikkevarer-miljo-og-ressursmessige-forhold)

<sup>10</sup> [DRS systems based on energy recovery is only approved if reuse or recycling is not technically, environmentally, or financially feasible.](https://www.miljodirektoratet.no/tema/emballasje-til-drikkevarer-miljo-og-ressursmessige-forhold)

<sup>11</sup> <https://lovdata.no/forskrift/2004-06-01-930/s7-4> Forskrift om gjenvinning og behandling av avfall, jf. §7-4

<sup>12</sup> [Deloitte Kartlegging-av-verdikjeden-for-plastemballasje.pdf \(emballasjeforeningen.no\)](https://www.miljodirektoratet.no/tema/emballasje-til-drikkevarer-miljo-og-ressursmessige-forhold)

## 2.2 ENVIRONMENTAL TAX

An important factor for the success of the DRS today, is the performance-based environmental tax that prevents cans and bottles from entering and polluting the environment.<sup>13</sup> The tax decreases in line with the proportion of packaging collected<sup>14</sup> (starting at 25% and waived at 95%), which incentivizes the industry to ensure the return of beverage containers. This means that companies that are part of a DRS with a return rate of 95% or higher are given an exemption from the tax.<sup>15</sup> Since 2009, beverage bottles sent to energy recovered are included in the collection rate of the DRS, but only when reuse and mechanical recycling are not technically, environmentally, or economically feasible.<sup>16,17</sup> Infinitum reached this collection rate for bottles in 2011 and cans in 2012, meaning that companies that are part of Infinitum's return scheme are exempted from the tax. The environmental tax is 4,06 NOK per plastic packaging unit in 2024 for producers that does not reach the collection rate.<sup>18</sup> Independent of the environmental tax, all producers and importers of beverage bottles are obliged to pay a basic tax to be a part of the DRS if the container cannot be used again in its original form.<sup>19</sup> In 2024 the basic tax is 1,38 NOK per unit of single-use beverage packaging<sup>20</sup>.

## 2.3 ORGANIZATION OF THE DRS

Infinitum operates on behalf of grocery retailers and producers, where each party owns an equal share of the holdings. The current collection infrastructure is designed by Infinitum and to become a member, entities must pay a deposit of 10,000 NOK, follow the design requirements of Infinitum and affix the containers with the designated deposit label.<sup>21</sup> The consumers pay a deposit when purchasing beverages which will be reimbursed when returning the containers.<sup>22</sup> The deposit value incentivizes the consumer to return empty beverage cans and bottles. The deposit can be reclaimed at any supermarket, kiosk, gas stations or other selling points offering beverages. Since 2018 the deposit has been 2 NOK for bottles and cans up to 0,5 liters and 3 NOK for larger containers.<sup>23</sup> Infinitum is refunding the deposit, which means that when bottles are not returned, Infinitum retains the revenue generated from the sale of the beverage bottle as a revenue. In 2019, unreturned bottles gave Infinitum an income of 250 million NOK. This means that the current system actually rewards the PRO for unreturned bottles.

## 3. EFFECTIVENESS OF THE NORWEGIAN DRS SYSTEM

### 3.1 APPROACH TO ASSESS EFFECTIVENESS

The effectiveness of the DRS system can be assessed in various ways. In the following part, the effectiveness is assessed based on the collection rate as well as waste strategies from the waste hierarchy. We have assessed the following strategies: prevent, reduce, reuse and recycle with the aim of discussing the circularity of the DRS value chain. Recovery and disposal will be included as well, but not as solutions for improved circularity, but rather processes to avoid.

<sup>13</sup> [Norway's deposit return scheme is world's recycling role model \(tomra.com\)](#)

<sup>14</sup> Defined as beverage packaging collected for both recycling and energy recovery.

<sup>15</sup> [Forskrift om særavgifter - Kap. 3-5. Avgifter på drikkevareemballasje \(miljø- og grunnavgift\) - Lovdata](#)  
<sup>16</sup> [infinitum annualreport 2022 pages.pdf](#)

<sup>17</sup> <https://lovdata.no/forskrift/2004-06-01-930/§7-4> Forskrift om gjenvinning og behandling av avfall, jf. §6-4

<sup>18</sup> [Avgift på drikkevareemballasje - Skatteetaten](#)

<sup>19</sup> [Forskrift om særavgifter - Kap. 3-5. Avgifter på drikkevareemballasje \(miljø- og grunnavgift\) - Lovdata](#)

<sup>20</sup> [Avgift på drikkevareemballasje - Skatteetaten](#)

<sup>21</sup> [Kostnadskalkulator \(infinitum.no\)](#)

<sup>22</sup> [Deloitte Kartlegging-av-verdikjeden-for-plastemballasje.pdf \(emballasieforeningen.no\)](#)

<sup>23</sup> [Nye pantestatser \(infinitum.no\)](#)



### 3.2 THE WASTE HIERARCHY

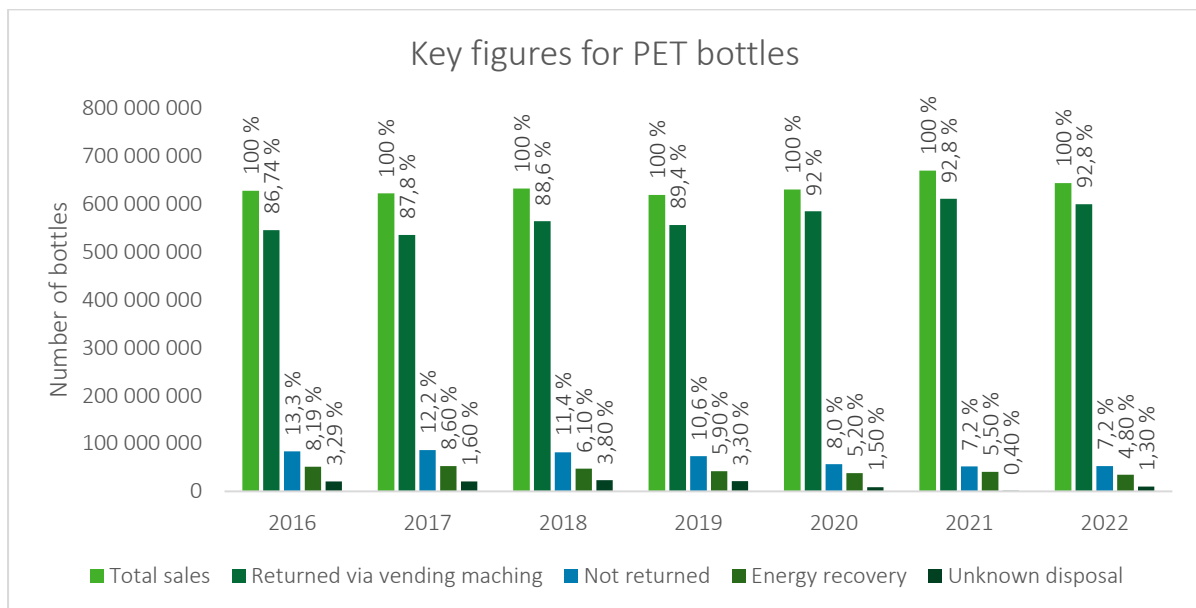
The waste hierarchy indicates the priorities in Norwegian and European waste policies. It aims to minimize waste generation and maximize resource conservation, primarily through the recovery of substances and materials, followed by energy recovery (see figure 2).<sup>24, 25</sup> The framework presents six different strategies for the treatment of waste, where preventing waste is the preferred approach, while resorting to disposal is considered the least preferred option. According to the Norwegian Waste Regulation, producers must report on the amount collected, reused, recycled, energy recovered or if other methods are deployed.<sup>26</sup> In the case of the Norwegian DRS, disposal is not considered, as methods such as landfill is not a common practice and as plastic waste that is incinerated primarily goes to energy recovery.<sup>27, 28</sup> Using the waste hierarchy can help assess the environmental impact of the waste strategies used in the Norwegian DRS. Below, is an overview of the effectiveness of the system assessed according to the waste hierarchy.



Figure 2. The Waste Hierarchy as defined by EU, and commonly applied by other organizations.

### 3.3 COLLECTION RATES

Table 1. The amount of total sold, returned, not returned, energy recovered and bottles with unknown disposal from 2016-2022.



<sup>24</sup> The waste hierarchy is an important part of the EU Waste Framework Directive (WFD), which sets targets and criteria for the handling of waste and guidance towards sustainable waste management practices.

<sup>25</sup> The directive also promotes Extended Producer Responsibility (EPR), which hold producers responsible for the environmental impacts of their products throughout their lifecycle, including financing the costs of collection, treatment, and disposal at end-of-life. [Waste Framework Directive - European Commission \(europa.eu\)](https://ec.europa.eu/euro-observatory/en/waste-framework-directive)

<sup>26</sup> [Forskrift om gjenvinning og behandling av avfall \(avfallsforskriften\) - Kapittel 7. Emballasje og emballasjeavfall - Lovdata](#)

<sup>27</sup> [Energigjenvinning.pdf](#)

<sup>28</sup> Energy recovery is currently the only permitted method for treating waste that is not suitable for reuse or material recycling due to its nature, content of hazardous substances, or quality. [Energigjenvinning.pdf](#)

The effectiveness of the DRS system is normally defined by the high collection rates. This contributes to obtaining a high level of material recycling and reduces the risk of the PET bottles ending up in the wild. The Norwegian DRS system has one of the highest return rates worldwide and provides several incentives to motivate both collection and return of beverage bottles.

Market research from Norway showed that the biggest motivation for returning beverage bottles was getting back the deposit with a 68 % total of respondents.<sup>29, 30</sup> However, 66 % of the Norwegian respondents wanted to return the beverage bottles to show consideration for the environment. In Norway donating to charity was popular with a total of 11 % of all respondents.<sup>31 32</sup>

In 2018, there was an increase in deposit rates to incentivise consumers to return more plastic bottles which aimed to increase the return rate to 90%.<sup>33</sup> In the same year, plastic wine bottles were also incorporated in the Norwegian DRS to expand the scope of recyclable packaging.<sup>34</sup> In 2022, 92.8% of Infinium's plastic bottles were returned through a reverse vending machine. Further, 4.8% of the plastic bottles were sent to energy recovery, 7,2% were not returned through the reverse vending machines and 1,3% ended up in unknown allocations.

### 3.4 PREVENTION AND REDUCTION

Prevention and reduction are waste strategies that aim to eliminate waste before it is produced. They represent the least environmental harming strategies in the waste hierarchy<sup>35</sup>, working to prevent and reduce the material flow of plastic. Producers of beverage containers are, according to the Norwegian Waste Regulation, obliged to prevent waste.<sup>36</sup> Nevertheless, the number of sold single-use bottles has gradually increased since 2016 (see table 1), indicating that prevention and reduction have received limited attention. Today's regulations and incentives predominantly focuses on the reduction of waste and addresses downstream aspects of the value chain. However, there is a need to move the emphasis onto upstream solutions to actively reduce plastic consumption and achieve increased circularity.

### 3.5 REUSE

Reuse is using a product again without altering its initial purpose or form. It is an important strategy in the waste hierarchy because it can reduce the amount of virgin resources and prevent waste.<sup>37</sup> Reuse of bottles in their original form is not a part of today's DRS, as the system is a single-use system where recycling is used to produce new bottles. Before the single-use system was implemented in 1999, Norway had a reuse system where refillable glass containers were used multiple times. Reuse plastic bottles is likely to come back to a certain degree, as the EU is implementing amendments in the PPWR, where 10 % of the packaging must be reusable already in 2030.<sup>38</sup>

Ellen McArthur Foundation argues that reused bottles outperform single-use plastic for three environmental metrics: material use, greenhouse gas emissions and water consumption. It is elaborated that regardless of how renewable or recyclable the material is, nothing surpasses reuse in

<sup>29</sup> TOMRA did a market study on why consumers recycle and what factors contribute to successful return rate in Sweden, Denmark, Norway, Slovakia, Finland, Netherland, and Germany.

<sup>30</sup> [TOMRA Collection Consumer Insights Report 2023](#)

<sup>31</sup> [TOMRA Collection Consumer Insights Report 2023](#)

<sup>32</sup> In Norway, consumers can choose to use their refund to enter a lottery draw where it is possible to win up to 1 million NOK while the non-winning tickets go to charity: [TOMRA Collection Consumer Insights Report 2023](#)

<sup>33</sup> [Ny pantesats for første gang på over 25 år – NRK Norge – Oversikt over nyheter fra ulike deler av landet](#)

<sup>34</sup> [infinitem annual report 2019 01 low.pdf](#)

<sup>35</sup> [Waste hierarchy - EUR-Lex \(europa.eu\)](#)

<sup>36</sup> [Forskrift om gjenvinning og behandling av avfall \(avfallsforskriften\) - Kapittel 7. Emballasje og emballasjeavfall - Lovdata](#)

<sup>37</sup> [Product reuse and longer lifespans hold untapped potential to cut waste in Europe — European Environment Agency \(europa.eu\)](#)

<sup>38</sup> [Packaging: Council and Parliament strike a deal to make packaging more sustainable and reduce packaging waste in the EU - Consilium \(europa.eu\)](#)

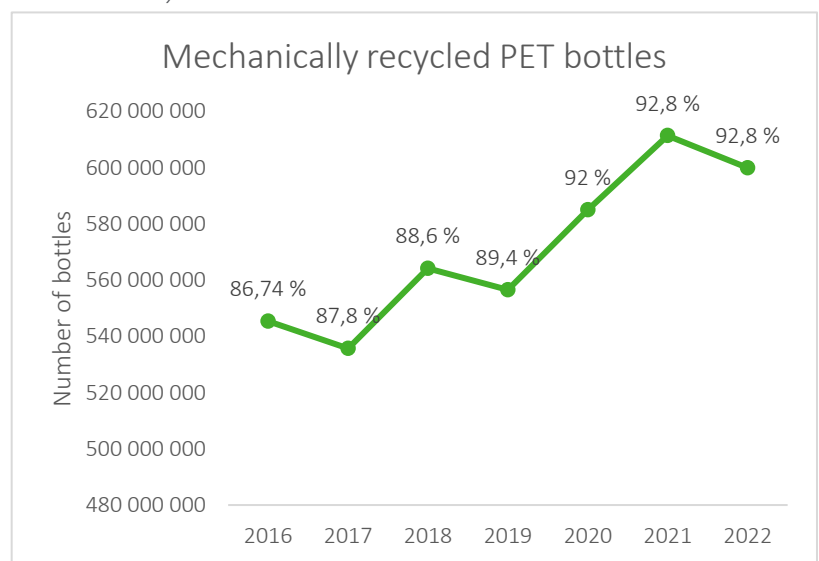
minimizing environmental impact.<sup>39</sup> European Commission Joint Research Centre (JRC) also published a case study (2024) on single-use versus reusable packaging where multi-use bottles had a lower or tied impact score compared to single-use. This Life Cycle Analysis (LCA) incorporated more than greenhouse gas emissions and water use, it also included ozone depletion potential, cancer and non-cancer related human toxicity, acidification, in addition to ten other impacts.<sup>40</sup> On the contrary, research by Norsus on behalf of Infinitum (2023) suggests that recycling has a lower impact on climate change, cumulative energy demand, and terrestrial acidification compared to reuse. Norsus has conducted an LCA, comparing an alternative reuse system with Infinitum's recycling system and concluded that the latter is more climate- and environmentally friendly in terms of the Norwegian DRS.<sup>41</sup> Due to a variety of results, more research is needed to fully understand the impacts of the DRS versus a modern reuse system in a Norwegian context.

### 3.6 MECHANICAL RECYCLING

Mechanical recycling is when plastic waste is turned into secondary raw materials or products without significantly changing the material structure.<sup>42</sup> This includes processes such as sorting, washing, shredding and melting. Mechanical recycling is the main strategy of the current DRS in Norway and represents how the majority of collected beverage containers are treated. In 2022, a total of 22,145 tonnes of plastic were mechanically recycled, achieving a 92,8% recycling rate.<sup>43</sup>

In order to meet the EU's requirement for 25% recycled content in all plastic bottles by 2025, the production and availability of high-value, transparent recycled PET (rPET) becomes crucial. Several producers<sup>44</sup> are already using 100% recycled plastic or are aiming to increase the percentage of recycled plastic in their bottles to both comply with the new regulations and to decrease their environmental impact. As a result, the scarcity of high-value recycled plastic in the market is increasing, driven by the rapidly increasing demand.<sup>45</sup> Norwegian producers have raised concerns about the new regulatory requirements, as a consistent supply of rPET polymers is a challenge.<sup>46</sup> The recycled plastic from Infinitum is often sold to other industries and producers who use it to strengthen their sustainability profile and by doing so avoid recycling their own products. Some of the rPET are sold to countries without a DRS system, which represents a dead-end for the materials that could have been recycled

Table 2. The amount of mechanically recycled PET bottles from 2016-2022 based on total sales each year.



<sup>39</sup> [Unlocking a reuse revolution - scaling returnable packaging.pdf \(thirdlight.com\)](#)

<sup>40</sup> [JRC publishes case studies on single-use versus reusable packaging | Food Packaging Forum](#)

<sup>41</sup> [Infinitum](#)

<sup>42</sup> <https://plasticseurope.org/sustainability/circularity/recycling/mechanical-recycling/>

<sup>43</sup> [infinitum\\_a-rsrapport\\_2022\\_web-6.pdf](#)

<sup>44</sup> Coca-Cola have redesigned their bottles in 2020 to contain 100% recycled plastic: [Recycled Plastic Packaging in Netherlands and Norway - News & Articles \(coca-colacompany.com\)](#). Ringnes did the same to their Imsdal bottles in 2019: [Nyheter » Derfor velger Ringnes 80 prosent resirkulert plast fremfor 100 prosent « Ringnes AS](#)

<sup>45</sup> [Får ikke tak i nok resirkulert plast til drikkevarer i Europa | Nordic Pack AS](#)

<sup>46</sup> [PowerPoint Presentation \(emballaseforeningen.no\)](#)

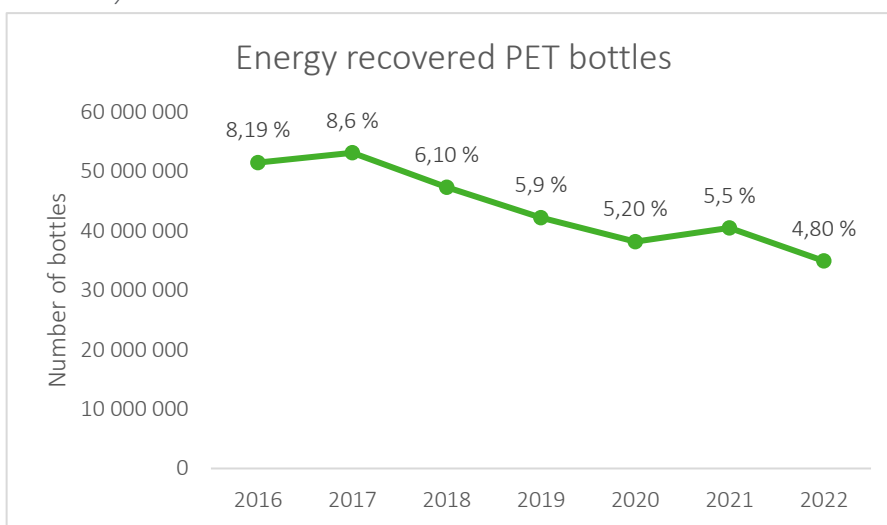
many times over.<sup>47</sup> As a consequence, high value plastic is removed from Infinium’s plastic loop and must be replaced by virgin plastic.

### 3.7 ENERGY RECOVERY

Energy recovery is a part of the waste hierarchy; however, it is not a strategy to improve circularity, but rather a way to deal with waste already created. Energy recovery is when waste is incinerated to produce energy and should only be applied when better strategies from the waste hierarchy are not feasible. In the Norwegian DRS, Energy recovery is accounted for in the collection rate, although this is not directly a circular strategy.<sup>48</sup> In Norway, there is a requirement in the Waste Regulation, that Energy utilization Incineration plants should be designed, constructed, and operated in a manner that maximizes the utilization of all thermal energy generated by the incineration process to the extent that it is practically feasible<sup>49</sup>.

PET Bottles are sent to energy recovery when they are too dirty or contaminated to be used for recycling. In Norway, there has been a gradual decrease in bottles sent to energy recovery over the last years. Energy recovery represented 4.8% of all returned beverage containers in 2022. A reason for dirty plastic bottles is that they are thrown in the residual waste, which makes the

Table 3. The amount of energy recovered plastic bottles from 2016 – 2022 based on total sales each year.



plastic unsuitable for recycling. Infinium regularly counts bottles and the residual waste and estimates how many bottles that are sent for energy recovery.<sup>50</sup> In 2022, Infinium sent 44,650,054 beverage plastic bottles for energy recovery, which amounts to 1,283 tonnes of unrecycled materials and 4.8% of total bottles in the DRS system. Because the number from energy recovery is accounted for in the collection rate, Infinium reached a 98% collection rate in 2022. If bottles sent to energy recovery were to no longer be accepted as a recycling method in Norway, Infinium would fail to meet the exception of the environmental tax (95% collected) as only 92,8% are mechanically recycled.<sup>51</sup>

<sup>47</sup> [Infinium closes the loop](#)

<sup>48</sup> [Waste hierarchy - EUR-Lex \(europa.eu\)](#)

<sup>49</sup> [Forskrift om gjenvinning og behandling av avfall \(avfallsforskriften\) - Kapittel 10. Forbrenning av avfall - Lovdata](#)

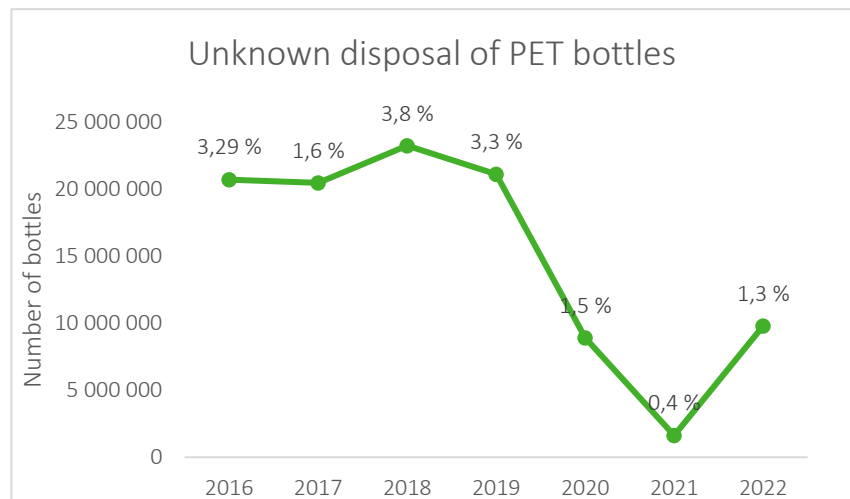
<sup>50</sup> [Kastet 100 millioner rett i søpla \(aftenposten.no\)](#)

<sup>51</sup> [infinium a-rsrapport 2022 web-6.pdf](#)

### 3.8 LEAKAGE TO THE ENVIRONMENT

Disposal is defined as an operation that does not include recovery of materials.<sup>52</sup> Disposal is at the bottom of the waste hierarchy and has the worst environmental consequences. There are strict requirements for disposal in Norway and such practices are not carried out for PET bottles.<sup>53</sup> Nevertheless, some PET bottles are still ending up in nature. Numbers from Infinitum show that 9,9791,771 bottles were not accounted for (in 2022), representing 1,30% of bottles sold. Infinitum does not know where the bottles end up, representing 300 tonnes of unallocated PET.<sup>54</sup>

Table 4. The amount of bottles with unknown disposal from 2016 – 2022 based on total sales each year.



### 4. CONCLUSION

The effectiveness of the Norwegian DRS may be assessed according to its contribution to achieving or avoiding the strategies in the waste hierarchy. This case study shows that the current Norwegian DRS is effective in terms of achieving high collection rates, and it can also be argued that this lowers the risk of bottles ending up in the environment. The high collection rates further lay the foundation for high recycling rates and establishes a flow of high value rPET. However, some important strategies for improved circularity are nevertheless not addressed to the same extent. Today's regulations in Norway are focused on waste and how to deal with downstream plastics and have a limited focus on the reduction of plastic consumption.

**Prevent and Reduce:** Limited attention is paid to the implementation of measures to reduce the actual number of plastic beverage bottles put on the market. Design criteria set out by the PRO could contribute to reducing the volume of plastic used, however limited design requirements are set by the PROs. This will, however, now be challenged by EU's new design requirements in the PPWR, where minimizing the use of unnecessary plastic in packaging design is a criterion for bottle design, including reduction targets of 5% by 2030 and 15% by 2040.<sup>55</sup> Here, Norwegian PRO's could help accelerating the change and drive the reduction of virgin plastic. As one of the best DRS worldwide, the Norwegian system could be at the forefront of adapting to new requirements.

**Reuse:** The Norwegian DRS is not based on reuse in the sense that bottles are used again in their original shape. However, changes in regulatory requirements of the PPWR requires that at least 10% of beverages sold should have reusable packaging.<sup>56</sup> If this is implemented into Norwegian law, this could

<sup>52</sup> [Waste hierarchy - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/)

<sup>53</sup> [Deponering av avfall \(miljodirektoratet.no\)](https://miljodirektoratet.no/)

<sup>54</sup> [infinitum annualreport 2022 pages.pdf](#)

<sup>55</sup> [New EU rules to reduce, reuse and recycle packaging | News | European Parliament \(europa.eu\)](#)

<sup>56</sup> [New EU rules to reduce, reuse and recycle packaging | News | European Parliament \(europa.eu\)](#)



pose some challenges for the current DRS which would need to implement a certain amount of reused plastic. Although it is often argued that recycling is the better option in a Norwegian context, several studies are showing the contrary and more research is needed to fully understand the impacts.

**Recycling:** As a system based on recycling, the Norwegian DRS is highly effective when it comes to collecting and recycling bottles which results in a high material recovery rate. Keeping the plastic from beverage bottles in a closed loop is already a priority for Infinitum, but there is still a potential of increasing the amount of recycled plastics per bottle. A suggestion is to exchange the basic tax for beverage bottles with a material tax which will be based on the amount of recycled plastics. This will then encourage producers to reduce their use of virgin plastic. Infinitum therefore wants the Norwegian beverage packaging fee to be replaced with a material fee for recycled plastic to be able to compete with virgin plastic on market and give their members an incentive to buy the recycled plastic from Infinitum.<sup>57</sup>

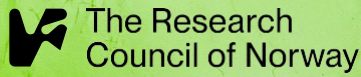
**Energy Recovery:** There is potential for increasing the share of bottles sent to material recovery, and reducing the share sent to energy recovery. Currently, the system does not incentivize higher material recovery rates, due to energy recovery being counted in the 95% collection rate. With 4.8% of plastic bottles from Infinitum being energy recovered in 2022, it could suggest that the deposit rate still can be increased to incentivize consumers to both clean if necessary and return all bottles.

**Leakage to nature:** Nevertheless, beverage bottles escaping the system and ending up in nature is still a problem in Norway. In 2022, 1.3% of all PET bottles ended up in unknown allocations. There is still potential to reduce littering and an increased deposit rate and other measures aimed at consumers could reduce littering further.

The Norwegian DRS is a good example of how a well-designed and regulated system can promote a circular economy and reduce environmental impact. While the current Norwegian DRS is effective in terms of high collection rates and recycling, it can be argued that it is less effective in addressing strategies such as reuse, prevention and reduction in the waste hierarchy. There is still room for improvement to make the system as environmentally friendly as possible while preserving its effectiveness. Certain adaptations might have to be implemented due to regulatory requirements from the EU, but Norway now has a chance to prove why we have one of the best DRS in the world and increase the effectiveness even further.

<sup>57</sup> [The environmental tax system \(infinitum.no\)](https://www.infinitum.no/en/the-environmental-tax-system)





**Deloitte**

