

**Written evidence submitted by Hans Kindbom and Rosalind McDermott**

## Sweden as a Model for Deposit Based Recycling in England, Wales and Northern Ireland

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## Executive Summary

The COVID-19 pandemic is creating extraordinary demands on government time and causing unprecedented financial strain. At the same time, the window of opportunity to limit global temperature rise to 1.5°C is running out<sup>1</sup> and the use of single-use plastics to prevent spread of the virus has dramatically increased, contributing to plastic pollution in our oceans.<sup>2</sup>

In this difficult context the government should prioritise effective, low-cost policies to green the post-Covid recovery. The Swedish Deposit Return Scheme (DRS) provides a simplified policy model to avoid an unnecessary burden on the government. It creates a profitable investment opportunity for industry, allowing private entities to cover the set-up costs and management of a preferred 'all-in' DRS model for a restricted scope of materials. The Swedish model will allow a prompt implementation of the DRS in order to invest into green industry in the post-Covid recovery, provide green jobs, and demonstrate that the government is working quickly to tackle environmental concerns.

Our analysis suggests that implementing the Swedish DRS model in the UK will considerably reduce litter disamenity, plastic pollution and CO<sub>2</sub> emissions (notably from recycling aluminum cans). Glass is not included in the Swedish DRS due to its high kerbside collection rate<sup>3</sup> and presumably due to its low profitability (from its weight-to-volume ratio)<sup>4</sup>. However, the UK DRS could be extended in scope in the future to cover more materials.

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<sup>1</sup> Environmental Audit Committee. [Greening the post-Covid Recovery](#). (Accessed 2020-08-03)

<sup>2</sup> Duer, J. [The plastic pandemic is only getting worse during COVID-19](#). World Economic Forum. 2020-07-01. (Accessed 2020-07-25)

<sup>3</sup> FERVER, [Sweden | FERVER - European Federation of Glass Recyclers](#) (Accessed 2020-07-22)

<sup>4</sup> British Glass. [Scottish DRS legislation](#). (Accessed 2020-08-03)

# Introduction

This report provides an analysis of the proposed Deposit Return Scheme (DRS) for beverage packaging following the initial consultation on 22nd August 2019.<sup>5</sup> Specifically, the report responds to the calls from the government for alternative models which can achieve the following outcomes set out in the consultation:<sup>6</sup>

- To reduce litter, and in turn, reduce litter disamenity
- To increase recycling of drinks containers in scope of a DRS, especially those disposed of 'on-the-go'
- To obtain higher quality recycling materials.

The report also responds to calls to '[Green the post-Covid Recovery](#)', giving evidence that a simplified DRS can provide both economic and environmental benefits.

The government was minded to introduce the DRS in 2023, and due to carry out a second consultation in early 2020.<sup>7</sup> The specific details of the DRS model were to be developed and presented in this second consultation.<sup>8</sup> It is assumed, without additional information, that this consultation has been delayed due to COVID-19.

The government is encouraged to promptly implement the DRS. The European Parliament approved a ban on single-use plastics by 2021 in the EU.<sup>9</sup> Post-EU, the UK Government must produce its own plan for sustainable consumption of single-use plastics and other materials in order to move towards a circular economy and reduce CO<sub>2</sub> emissions. With financial strain due to COVID-19, this proposal presents a simplified DRS model (both in material scope and management) to facilitate easier implementation and promptly achieve the government outcomes.

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<sup>5</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#). 2019.

<sup>6</sup> *ibid.* p.7

<sup>7</sup> *ibid.* p.65

<sup>8</sup> Department of Environment Food & Rural Affairs, [Introducing a Deposit Return Scheme \(DRS\) in England, Wales and Northern Ireland: Executive summary and next steps](#). 2019

<sup>9</sup> SDG Knowledge Hub. [European Parliament Passes Single-use Plastic Ban](#). 2019-04-02. (Accessed 2020-07-22)

# Deposit Return Scheme in the UK

The following points summarise the initial proposal for the DRS in England, Wales and Northern Ireland:

1. The government wishes to introduce a nation-wide and coherent DRS, where a deposit is added to the price of a beverage and redeemed when the consumer returns the container to any collection point.
2. The DRS would include an ambitious scope of materials: PET and HDPE plastic bottles, aluminum and steel cans, and glass bottles. The drinks included would be water, soft drinks, juice, alcohol and milk-containing drinks. All beverage producers using this packaging would be mandated to join the DRS to enter the UK market. The proposal additionally considers the size of the containers to be included in the DRS: see the “all-in” and “on-the-go” options.
3. The DRS would be managed by a central, not-for-profit body called the Deposit Management Organisation (DMO). The government is seeking feedback on who to include in the board (e.g government, industry, trade associations for hosting return points), whether the government should be involved in the set-up and management of the DMO, and if the government should set the deposit value.
4. Drinks containers would be returned via reverse vending machines (RVMs) or manual returns in hosting return points (e.g retailers and high footfall areas). The DMO would organise collection, sorting and transport of materials to recycling centres and reimburse the hosting return point.
5. The DRS would promote the use of easily recyclable packaging. The government proposes that the DMO charge producer fees which reflect the environmental cost of a product, or charge additional fees for difficult packaging. These fees would be decided by government, industry or local authorities.
6. As a not-for-profit organisation, the government proposes that an enforcement body audits the DMO's operations to ensure transparent financial flows.
7. The government notes that local authorities are important stakeholders in the process due to their interaction with waste collection and their reliance on recyclable materials as a source of income.

For full information please see the [consultation document](#).

## Consultation Response

Respondents were strongly in favour of implementing a DRS. However, views were mixed about

the effectiveness of alternative approaches to the proposed model, with 28% of respondents stating that they did not have enough information to provide a viewpoint.

For full details please see the [consultation outcome](#).

## Retailer Response

Several UK retailers have demonstrated their support for the DRS by independently trialling RVMs in their stores in 2019:

- [Iceland](#) trialled RVMs for plastic PET bottles in five UK stores. Richard Walker, Managing Director at Iceland, found that 95% consumers surveyed wanted the deposit scheme to become nationwide. He stated that Iceland was ready to implement the scheme across 950 UK stores with government support.<sup>10</sup>
- [Sainsburys'](#) partnered with TOMRA to trial a RVM at one of its stores with plastic PET, aluminum cans and glass bottles<sup>11</sup>.
- [Co-op](#) partnered with TOMRA to introduce RVMs at several summer festivals to encourage consumers to return Co-op own-brand PET water bottles.<sup>12</sup>

## Scotland and the DRS

The government notes in the consultation document that the scheme should include Scotland to ensure regulatory consistency across the UK. However, the Scottish government have since brought forward the implementation of a wide-ranging DRS to 2021, independent from England, Wales and Northern Island. Due to COVID-19, the date for implementing the scheme has been pushed back to July 2022.<sup>13</sup> This extension time could be used to work towards a UK wide scheme. However, the Swedish model could allow the separate schemes to work alongside each other (see '[Considerations](#)').

# Deposit Return Scheme in Sweden

Sweden's DRS includes aluminum cans and plastic PET bottles of all sizes (the "all-in" option proposed in the consultation).<sup>14</sup> Glass containers are not included in the system (see

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<sup>10</sup> Zimmatore, D. [Iceland's 'reverse vending machines' reach one million plastic bottles recycled](#). Climate Action. 2019-08-27. (Accessed 2020-07-29)

<sup>11</sup> Date, W. [Sainsbury's includes glass in reverse vending trial](#). Environment Media Group. 2019-08-27. (Accessed 2020-07-31)

<sup>12</sup> Williams, D. [UK festival plastic bottle deposit return scheme trial set to launch](#). Packaging Gateway. 2019-07-02. (Accessed 2020-07-29)

<sup>13</sup> Doherty, J. [Scotland delays DRS introduction](#). Environment Media Group. 2020-03-17. (Accessed 2020-07-31)

<sup>14</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return](#)

[‘Considerations’](#)). The DRS currently has high return rates for targeted materials at approximately 85%, and the government has set out further goals to reach 90%.<sup>15</sup> The following sections summarise the features of the Swedish DRS:

## Regulation

Sweden’s government set clear goals for producers and left industry to find the most efficient means of achieving them.<sup>16</sup> The ordinance on producers’ responsibility for packaging (SFS 2006:1273) was authorised in 2006 by the Ministry of Environment.<sup>17</sup> The ordinance stipulates that beverage producers using PET bottles or aluminium cans are responsible for arranging for waste materials to be returned or recycled.<sup>18</sup> Producers must include their product in an approved return system to sell on the market.<sup>19</sup> The ordinance also sets out recycling targets.

## Independence from Government

Sweden’s DRS is industry-led. Private entities have set up nationwide and compatible deposit schemes in order to meet the ordinance requirements. A company can run a DRS for any number of brands so long as it is approved by the Swedish Board of Agriculture (as the supervisory authority).<sup>20</sup> The primary DRS is run by Svenska Returpack AB (Returpack), a private company owned by the Swedish Brewery Association, Food Retailers’ Federation and Grocery Store Federation.<sup>21</sup> In 2019, Returpack achieved a recycling rate of 84.9% for targeted materials and obtained a profit margin of 5.53%.<sup>22</sup> As the system is independently run, all set-up and management costs are covered by Returpack.

## Deposit Value

The second ordinance (SFS 2005:220)<sup>23</sup> was passed in conjunction with SFS 2006:1273 to require a financial incentive to be used to encourage the return of PET bottles and aluminum cans. As the ordinance does not require a specific deposit value, it is up to the private entity to decide the amount for effective collection rates and attract producers to their return system. The deposit value must be approved by the Board of Agriculture.

*Returpack charges a deposit rate of 1 SEK (~£0.09) per can or plastic bottle <1L.*

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[Scheme in England, Wales and Northern Ireland](#). 2019. p.50

<sup>15</sup> Zero Waste Scotland. [Deposit return in Sweden, A case study](#). (Accessed 2020-07-23)

<sup>16</sup> Suter, M, Kuomo, N. [The Swedish Deposit Return System – What Could the UK Learn?](#). Anthesis. 2019-05-10. (Accessed 2020-07-22)

<sup>17</sup> [SFS 2006:1273](#). Förordning om producentansvar för förpackningar

<sup>18</sup> Renström, C. [Recycling of ready for consumption beverage packaging](#). De Groene Zaak. (Accessed 2020-07-22)

<sup>19</sup> Pantamera. [Breweries & Importers](#). (Accessed 2020-07-22)

<sup>20</sup> [SFS 2005:220](#). Förordning om retursystem för plastflaskor och metallburkar

<sup>21</sup> Pantamera. [About Returpack](#). (Accessed 2020-07-24)

<sup>22</sup> Returpack Svenska AB. [Hållbarhetsredovisning 2019](#). (Accessed 2020-07-22)

<sup>23</sup> [SFS 2005:220](#). Förordning om retursystem för plastflaskor och metallburkar

## Beverage Design and Labelling

SFS 2005:220<sup>24</sup> also requires products in a DRS to be clearly labelled with a barcode and refund amount. This is to clarify to consumers which products belong to the DRS scheme and optimise the recycling process. To register with Returpack producers must meet these requirements,<sup>25</sup> and label design is negotiated between Returpack and the producer, with approval by the Board of Agriculture.

Product design is also negotiated between Returpack and the producer. Returpack charges additional sorting fees to the producer for hard-to-recycle containers such as coloured PET bottles and additional plastic materials. This encourages easily recyclable product design and eliminates the need for government regulation on the design of packaging (as considered in the UK consultation document).<sup>26</sup>

## Reverse Vending Machines

The UK consultation document sought feedback on whether RVMs should be owned by the DMO or by the hosting return point.<sup>27</sup> Under the condition that the DMO own the RVMs, the consultation document highlighted it would be a key set-up cost.<sup>28</sup>

In Sweden, retailers are responsible for purchasing their own RVM when they become a customer of Returpack. Retailers receive guidance from Returpack on approved RVM manufacturers and the appropriate model for their store conditions.<sup>29</sup> Returpack receives 94% of packaging volume through these retail RVMs, but sports clubs and airports (etc.) can also become a customer by purchasing a RVM.<sup>30</sup> The machines are read each week for the recovery statistics to calculate the deposit refund.

Customers (i.e hosting return points) are incentivised to purchase a RVM as they receive a variable handling fee per can and bottle, deposit compensation for the collected materials, and an additional fixed annual fee for the RVM. This management remuneration is paid weekly by Returpack. The calculations for the handling compensation are estimated yearly from large and small stores (as well as different locations) and cover the trade's cost for RVM purchase, servicing, labour, time, premises and materials.<sup>31</sup>

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<sup>24</sup> Ibid.

<sup>25</sup> Pantamera. [Breweries & Importers](#). (Accessed 2020-07-22)

<sup>26</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#). 2019. p.63

<sup>27</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#). 2019. p.36-37

<sup>28</sup> Ibid. pp.36-37

<sup>29</sup> Pantamera. [Pantautomater](#). (Accessed 2020-07-30)

<sup>30</sup> Pantamera. [Så går det till](#). (Accessed 2020-07-30)

<sup>31</sup> Pantamera. [Hanteringsåttning](#). (Accessed 2020-07-30)

## Manual Customers

Retailers are able to become a customer of Returpack without a RVM. Termed manual customers, the returned packaging is collected in bags and labelled appropriately. The wholesaler who delivered the drinks to the retailer will pick up the materials (paid by Returpack) and the store will receive the deposit value and variable handling fee after counting at the recycling centre.<sup>32</sup> This process allows restaurants and cafés to participate in manual collection and obtain the deposit if consumers leave their beverage packaging on the premises.<sup>33</sup>

## Financial Flows

Importers or producers entering the Swedish market must pay a non-returnable fee for each PET or aluminum package sold to Returpack as the primary DRS organisation. This covers costs of administration, collection and sorting. The importer or producer also pays a 10,000 SEK (~ £870) connecting fee to the DRS for the first year of membership which is passed on to the Board of Agriculture to fund supervision.<sup>34</sup>

The deposit value is subsequently added to the price of the beverage and the fee is passed through suppliers, wholesalers, retailers, and finally the consumer, encouraging them with nudge tactics to return the packaging to return points after use. Returpack manages collections from RVMs and reimburses wholesalers for delivering manual deposits to their sorting centers.<sup>35</sup>

As Returpack is owned by breweries and importers they are able to use the stable stream of recyclable material for new packaging. Their profits come from material revenue from the high-quality materials, producer fees and unredeemed deposits.<sup>36</sup>

## Advertisement

Returpack is able to invest its profits into advertisements to improve collection rates and public understanding of the scheme. Branding their campaign '[Pantamera](#)' (Recycle More) brand recognition is as high as 'Coca-Cola' in Sweden.<sup>37</sup>

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<sup>32</sup> Pantamera. [Så går det till](#). (Accessed 2020-07-30)

<sup>33</sup> *ibid*.

<sup>34</sup> Pantamera. [Producenter & Importörer](#). (Accessed 2020-07-30)

<sup>35</sup> Pantamera. [Producenter & Importörer](#). (Accessed 2020-07-30)

<sup>36</sup> *ibid*.

<sup>37</sup> Zero Waste Scotland. [Deposit return in Sweden](#). (Accessed 2020-07-22)

# Key Summary of the Swedish Model

<b>Materials in scope</b>	Aluminum cans, Polyethylene terephthalate (PET) bottles
<b>Drinks in scope</b>	Exceptions for products which consist mainly of dairy products
<b>Size of containers</b>	Corresponding “all-in” option in the consultation report
<b>Management of the DRS</b>	Private entities manage the DRS following approval from the Swedish Board of Agriculture. The primary organisation is Svenska Returpack AB (Returpack).
<b>Financing the DRS</b>	Set-up costs are covered by the private entity and profits are made from material revenue, producer fees and unredeemed deposits. The Board of Agriculture receives a connecting fee from producers to fund their regulatory role.
<b>Advertisement</b>	Returpack invests in advertisements for ‘ <a href="#">Pantamera</a> ’ (‘Recycle More’) to improve return rates.
<b>RVM ownership</b>	Retailers are responsible for purchasing their own RVM when they become a hosting return point, and receive an income flow of management remuneration for the RVM from Returpack.
<b>Deposit Values</b>	Returpack sets the deposit value to maximise packaging returns. Market equilibrium is achieved as higher deposit values provide a greater incentive for the consumer to return materials but Returpack must also satisfy producers who sign up to their system.
<b>Design and Labelling</b>	Producers are motivated to use recyclable designs to avoid additional fees from Returpack. Producers must include clear labelling of the deposit value and barcoding on packaging to enter the Returpack system, as approved by the Board of Agriculture.

# Current Recycling Rates and Market Size in the UK and Sweden

The data used in the analysis has been taken from the most up-to-date available sources.

## Recycling Rates

Swedish recycling rates are taken from 2019 and include cans and PET bottles. The recycling rate for PET bottles includes total deposit-based recycling whereas cans recycled are only those through Returpack (as the primary deposit company).<sup>38</sup> The data from Sweden has high accuracy as Returpack has a comprehensive overview of the recycling chain.

UK recycling rates are less accurate as a DRS is yet to be established, meaning the data is more difficult to obtain. It is estimated that 75% of aluminum cans were recycled within the UK in 2018<sup>39</sup> and 74% of plastic drink bottles in 2016. The figure for plastic bottles includes all types of plastic (including PET) so will most likely overestimate the actual figure for PET plastic bottles.<sup>40</sup>

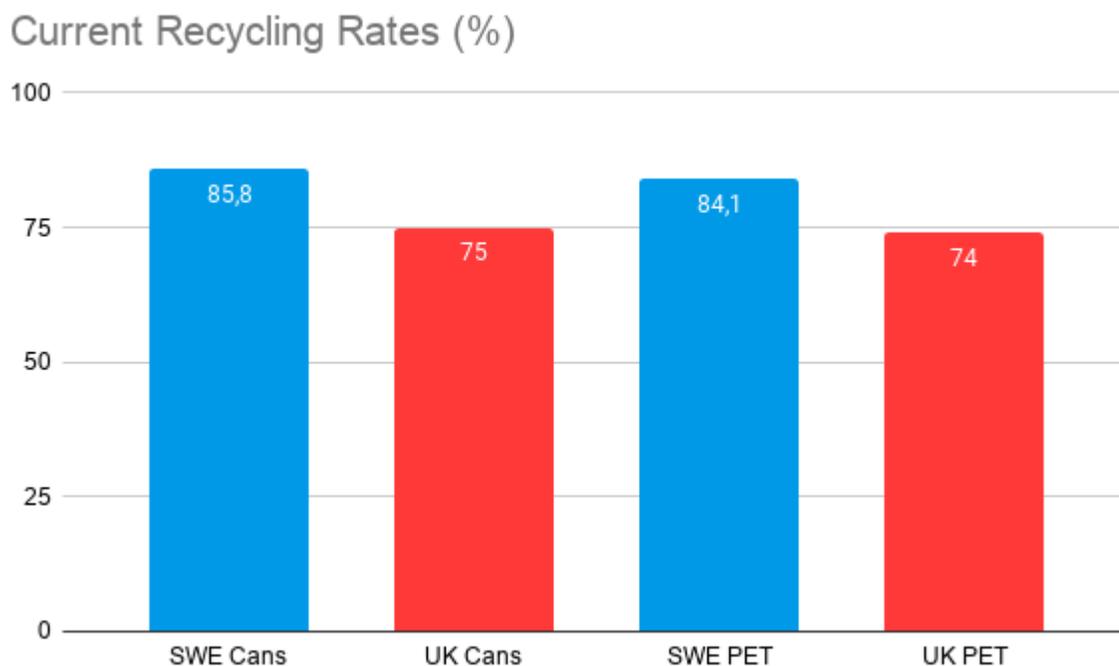


Figure 1. Difference in current recycling rates for aluminum cans and PET bottles between

<sup>38</sup> Pantamera. [Pantstatistik](#). (Accessed 2020-07-22)

<sup>39</sup> Alupro. [ALUMINIUM DRINK CANS HIT 75% RECYCLING RATE, AN INCREASE OF 38% IN JUST EIGHT YEARS](#). 2019-06-13. (Accessed 2020-07-24)

<sup>40</sup> Department of Environment Food & Rural Affairs, [Voluntary & Economics Incentives Working Group Report](#). Feb 2018. p.13

## Sweden and the UK

### Tonnes of Material Placed on the Market

The significant difference in market size between the two countries determines the amount of material it is possible to recycle (placed on each domestic market annually) shown in Figure 2. In Sweden, an estimated 23,159 tonnes of aluminum cans and 27,639 tonnes of PET bottles were placed on the market in 2019. These numbers are calculated by using data on recycling rates and recycled tonnes of material.<sup>41</sup>

In the UK, Valpak estimate that 317,000 tonnes PET bottles were placed on the market in 2017<sup>42</sup> and an estimated 131,313 tonnes of aluminum cans. The amount of aluminum has been calculated by multiplying the 9.1 billion cans sold in 2016<sup>43</sup> by the average weight of one aluminum can (0.01443 kg).<sup>44</sup> This is a key consideration when analysing the impacts of a percentage change increase in recycling rates in the UK, as compared to Sweden.

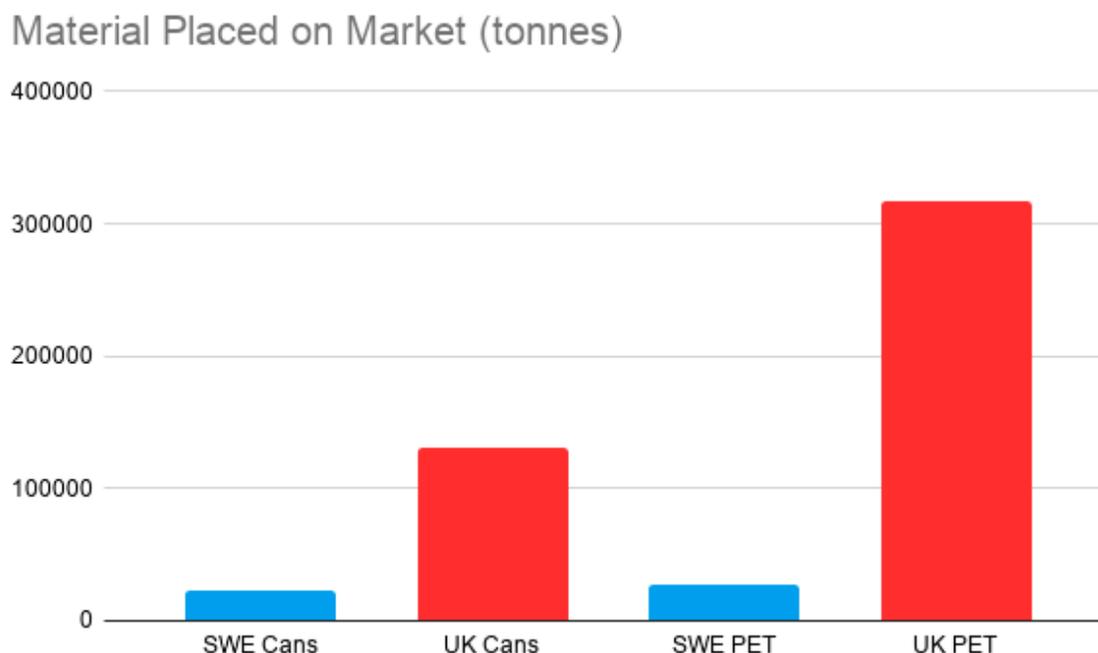


Figure 2. An illustration of the amount of PET and aluminum packaging placed on each country's market

<sup>41</sup> Pantamera. [Pantstatistik](#). (Accessed 2020-07-22)

<sup>42</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#). 2019. p.18

<sup>43</sup> Department of Environment Food & Rural Affairs, [Voluntary & Economics Incentives Working Group Report](#). Feb 2018. p.12

<sup>44</sup> Skill. [MILJÖSTATISTIK 2012](#). 2012-10-15. p.7

# Greening the Post-COVID Recovery and Meeting Government Outcomes

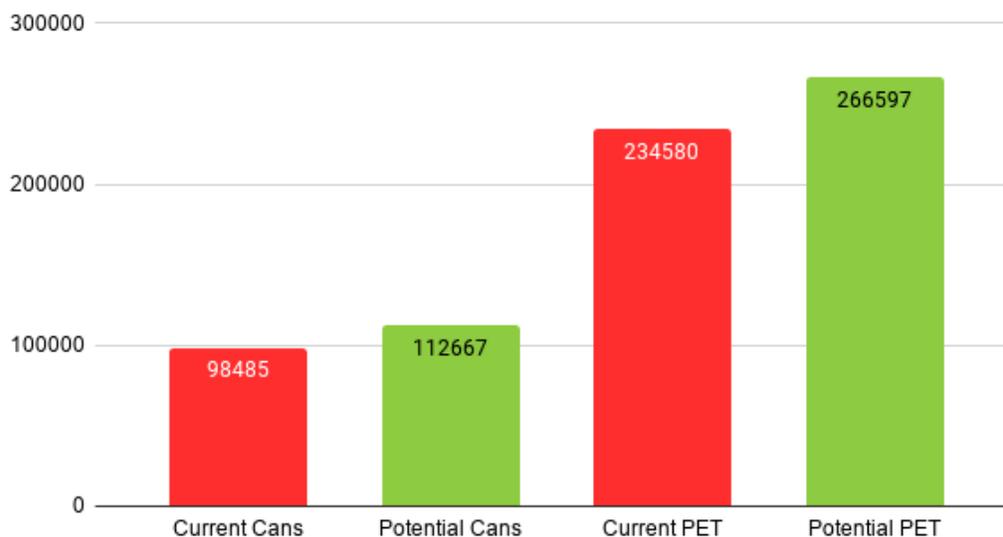
Sweden's DRS model is easier to implement due to its restricted material scope and private ownership, contrasted with suggestions in the initial proposal which centre government involvement and a wide-scope of materials. Implementing the simplified model in the UK will allow the government to quickly make progress towards greening the post-Covid recovery while meeting the stipulated outcomes for the DRS. The scheme could be extended in scope in the future to cover more materials.

## Litter Disamenity and CO<sub>2</sub>

In applying the higher Swedish collection rates to the UK, approximately 14,000 more tonnes of aluminum and 32,000 more tonnes of PET would be collected for recycling per year under the DRS. It is expected that increasing the collection of these materials will meet government outcomes by reducing litter disamenity. Should the materials included under the scheme be littered, members of the public will likely collect the materials to obtain the deposit. This could also result in local authorities achieving savings on litter clearance.

The current amount of aluminum cans and PET bottles collected for recycling in the UK was calculated by multiplying the recycling rate with the corresponding number in Figure 2. The predictions were calculated by using the Swedish recycling rates applied to the UK market size.

Current and Potential Material Collected for Recycling (tonnes)



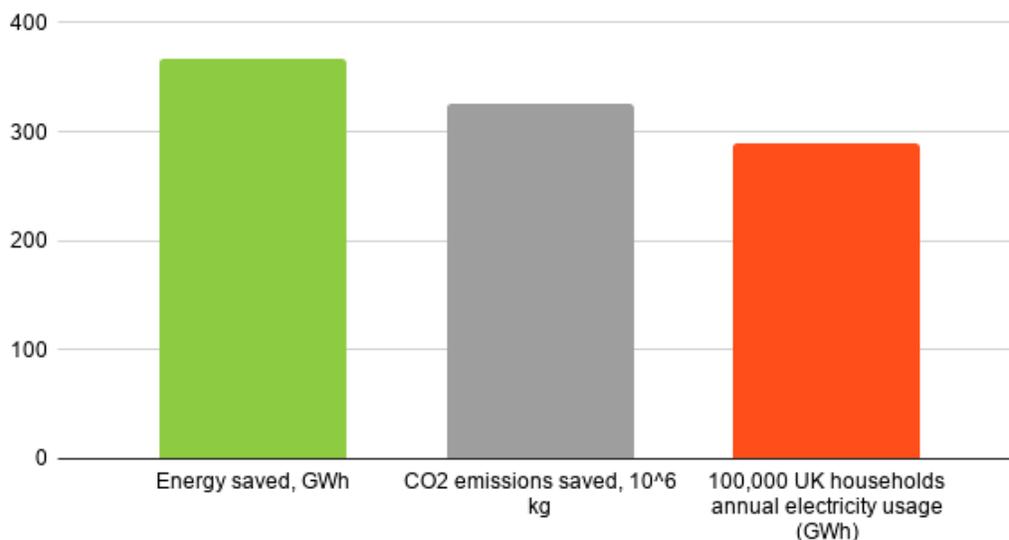
*Figure 3. Material collected in the UK under current recycling rates compared to predicted amounts under the Swedish DRS model*

Reducing the UK's annual CO<sub>2</sub> emissions continues to be a key target given the short window of opportunity to keep global temperature rise to a manageable level. Implementing the Swedish DRS model will substantially reduce CO<sub>2</sub> emissions from industry through saving energy in packaging production, which can be observed in Figure 4. As climate change mitigation is at the heart of greening the post-Covid recovery, implementing the scheme promptly will demonstrate a commitment to meeting environmental goals.

Saved energy and CO<sub>2</sub> are calculated by multiplying the difference in collected tonnes of material by energy (and CO<sub>2</sub>) saved per tonne, for both aluminum and PET. When 1 kg of recycled aluminum is used instead of new material, 14 kWh and 20 kg CO<sub>2</sub> are saved. The same figures for PET are 5.26 kWh and 1.3 kg respectively.<sup>45</sup> The large savings in CO<sub>2</sub> from aluminum cans highlight the importance of including them under the DRS.

The data used is from 2012, so it may be outdated. The estimates also do not take CO<sub>2</sub> production from running the DRS into account and Scotland is not treated separately in the calculations. Regarding the electricity usage for households, the total consumption is obtained using the Typical Domestic Consumption Value of 2,900 kWh for a medium Class 1 Household.<sup>46</sup>

#### Energy and CO<sub>2</sub> savings with SWE model



*Figure 4. How much CO<sub>2</sub> and energy that would be saved annually if the UK implemented the Swedish model, compared to 100,000 households' annual electricity usage.*

<sup>45</sup> Skill. [MILJÖSTATISTIK 2012](#). 2012-10-15. pp.7-8

<sup>46</sup> ofgem. [Typical Domestic Consumption Values](#). (Accessed 2020-07-27)

# Considerations

## Glass

Glass was included in the initial proposal for the DRS. Sweden does not include glass as it is deemed unnecessary due to high rates of recycling at 90%,<sup>47</sup> collected through densely situated kerbside bottle banks. It is also likely that glass was not included in the DRS due to its low material profitability (from its weight-to-volume ratio)<sup>48</sup> as well as health and safety concerns noted in the UK consultation report.<sup>49</sup>

As glass can be continuously recycled without losing quality, further research should focus on insights from Swedish kerbside recycling to improve collection rates for local governments.

## Local Government

In the initial proposal there were concerns raised that local governments would lose valuable income from recyclable materials under a wide-scope DRS. These concerns may be reduced when implementing the Swedish DRS model as glass and alternative plastics (for example HDPE milk bottles which are typically consumed at home) would be left to kerbside recycling. Further costing research should be done to calculate how local governments may be financially impacted by the DRS and compensated to continue effective kerbside collections of principle wastes (e.g organic waste).

## Scotland and the DRS

As Scotland moves forward to implement a DRS scheme independently, future research should be done on how England, Wales and Northern Ireland could implement the Swedish Model. Research on how the different DRSs of Sweden and Denmark interact between the open border of Malmo and Copenhagen could give insight into how Scotland's DRS could operate independently. How producers are able to engage in simultaneous DRS schemes when targeting both markets, or how DRS containers deposited in the wrong country could be refunded to the private entity are two routes for exploration.

## About the Authors

**Hannes Kindbom**

KTH Royal Institute of Technology

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<sup>47</sup> FERVER, [Sweden](#) (Accessed 2020-07-22)

<sup>48</sup> British Glass. [Scottish DRS legislation](#). (Accessed 2020-08-03)

<sup>49</sup> Department of Environment Food & Rural Affairs, [Consultation on introducing a Deposit Return Scheme in England, Wales and Northern Ireland](#). 2019. p.42

M.Sc. Machine Learning,  
M.Sc. Industrial Engineering & Management, Optimization and Systems Theory  
[LinkedIn profile](#)



**Rosalind McDermott**  
University of Birmingham  
BA/B.Sc. Liberal Arts and Sciences  
[LinkedIn profile](#)



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