Czech DRS

Critique of CETA's Review for the Ministry of Environment

Date: 26/07/19

Authors: Dr Chris Sherrington & Orla Woods

1.0 Introduction

In January 2019, Karlovarské minerální vody, a.s. (KMV) and Institut Cirkulární Ekonomiky (INCIEN) published a study by Eunomia Research & Consulting Ltd. (Eunomia) on a potential deposit refund system (DRS) for the Czech Republic. KMV had also commissioned a life cycle assessment (LCA) of the proposed DRS, which was undertaken by the University of Chemistry and Technology, Prague and, at the same time, INCIEN produced a report relating to the Czech Republic's existing waste management system and a critical analysis of the waste data.

These three reports led to KMV's 'Let's Deposit' initiative. After Eunomia's study outlined how a DRS could work, based on best practice elsewhere, and set out the potential costs and benefits, the aim of Let's Deposit is to investigate in more detail how exactly a DRS could work in the Czech Republic in practice and to develop an appropriate system for the Czech Republic.[1]

The Centre of Economic and Market Analyses, z.ú. (CETA) subsequently undertook an evaluation of the three studies, concluding that a DRS is not justified in the Czech Republic.[2]

KMV asked Eunomia to respond to the CETA report, which contains a number of inaccuracies and misleading assumptions and or/ conclusions. The CETA report was published in Czech, however KMV has provided Eunomia with a full translation. (Just as Eunomia's report was originally in English and subsequently translated, it is possible that some nuances in both reports have been lost/ misinterpreted).

Eunomia's response to the CETA report relates solely to the criticisms directed at the Eunomia study; the authors are not in a position to comment on either the University's LCA or INCIEN's report.

[1] https://www.zalohujme.cz/#o-projektu

[2] CETA (2019) *Impact Study on Introduction of the Deposit Return System (DRS) for PET Beverage Packaging*. June 2019

2.0 General Observations

The CETA report states that the three studies that informed the Let's Deposit initiative were all reviewed. These were three separate studies, conducted by different organisations and each had different objectives. However, it's worth noting that CETA does not always clearly differentiate between the three studies.

Nor is it always clear that CETA has read the entirety of the Eunomia report, as there are a number of instances in which Eunomia's findings or methodology are misrepresented, or simply ignored. For instance, CETA accuses Let's Deposit of:

> *"ignoring possible negative impacts on affected subjects (households; towns and cities; manufacturers and traders; waste industry)".*

There is no recognition that the Eunomia study assessed the impact on municipalities, separation facilities and Eko-Kom, and calculated costs for beverage producers. CETA of course can disagree with Eunomia's conclusions and is welcome to provide evidence to contradict them, however simply ignoring Eunomia's findings and recommendations risks exaggerating concerns and creating undue fear about the impact of a DRS.

It is notable too that CETA does not comment on the two scenarios modelled by Eunomia (a DRS for PET bottles only; and a DRS for both PET bottles and metal cans) and instead chooses to focus almost exclusively on the PET scenario, with little recognition that cans could additionally be included.

Nor is it apparent that the key principles of a DRS have been clearly understood by CETA. For example, CETA repeatedly raises concerns about the impact on retailers, but there is no recognition of the handling fees that will be used to compensate them. The funding principles have also only been partially considered, with a lot of focus on the unredeemed deposits and material revenues, but no comment on the producer fees.

CETA emphasises the different waste statistics used by Eunomia and INCIEN and seems to imply that this is either an oversight on the part of the study teams, or tries to use Eunomia's report to discredit INCIEN. In reality, the intention had always been for Eunomia to use Eko-Kom data as the official, public source of data, while INCIEN had been tasked with undertaking a thorough analysis of the waste flows. The use of Eko-Kom data represented a conservative approach from Let's Deposit because, if Eunomia had used INCIEN's *higher* estimates of the number of units placed on the market and *lower* recycling rates, the cost per container of the DRS would have been lower and the environmental impact of the DRS would have been greater.

It should be noted that CETA refers throughout to the target in the Single Use Plastics (SUP) Directive to collect 90% of plastic beverage bottles. However, they seem to ignore a key detail, as the requirement is "to ensure the separate collection for recycling", not simply the

collection.[3] As such, CETA's analysis seems to rely on collection of 90% of plastic beverage bottles, and not collecting plastic beverage bottles *separately*.

CETA rightly highlights the wider EU targets, including the need to reduce the proportion of waste that is landfilled from the estimated 45% to 10% by 2035 and the overall and material-specific packaging targets in the Packaging and Packaging Waste Directive. The report seems to suggest, however, that a DRS will not support these targets at all. It seems contradictory to try to claim, as CETA appears to, both that the amount recycled by the DRS is too insignificant to count towards to recycling targets, but is simultaneously so significant that a DRS threatens the viability of the existing waste management system.

Finally, it is disappointing that there is no recognition in the CETA report that the Let's Deposit project is the initiative of a beverage company (KMV), seeking to take both organisational and financial responsibility for the waste it places on the market, and working to increase the recycled content of its beverage containers.

CETA recommends that, if the Ministry of the Environment decides to proceed with the concept of a DRS, then discussions will all stakeholders and "a detailed analysis of the system logistics, sensitivity analyses of financing, sustainability stress tests, etc." will be needed. Having conducted an initial feasibility study, Eunomia agrees that more detailed analysis is needed, and the report's conclusion made clear that the next steps would be for KMV to explore this in more detail with other stakeholders. The study was not intended to be a detailed impact assessment or to design and model the intricate logistics operations of a DRS; the idea of Let's Deposit is to take forward the very discussions recommended by both Eunomia and CETA.

3.0 Existing Waste Management & Alternatives to the DRS

3.1 Current Performance

CETA claims that Let's Deposit concluded that:

> *"The existing system is not able to increase the collection and recycling rates of PET beverage bottles."*

Eunomia's report specifically addressed the question of the achievement of the 90% target, rather than whether or not any increase at all could be achieved under the current system. However, the Eunomia report did express doubts about the feasibility – and affordability – of achieving the 90% target through relying solely on the existing framework.

[3] Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2019:155:TOC

CETA reports a 73.7% packaging recycling rate. However, as noted in Eunomia's report and in the statement from the Association of Regions of the Czech Republic in Annex 4 of CETA's report, approximately half of the plastic packaging that is collected separately is not actually recycled. CETA's report does not seem to recognise this as a weakness of the existing system or a fundamental problem that will need to be addressed. This is despite Article 11a of the revised Waste Framework Directive introducing new rules for the calculation of attainment against recycling targets. Official recycling rates across the EU are consequently expected to fall and the challenge for Member States to meet targets will be higher. CETA offers a rather optimistic estimate that the plastic recycling rate will only reduce by 1% as a result, without providing any evidence to support this.

Chart 4 in CETA's report provides the tonnes of sorted waste for each material fraction, highlighting how 632,000 tonnes is sorted. The chart does not, however, put this in the context of the total amount of municipal waste generated (5,691,000 tonnes), indicating that only 11% is sorted.

Similarly, in focusing on plastics, CETA does not comment in detail on the low 20.1% recycling rate for aluminium; the DRS could help to boost this – but would not solve the problem alone – if cans were included.

3.2 Options for Achieving Targets

CETA includes Eko-Kom's analysis of options to achieve targets, which looked at:

1) Intensification of collections;
2) Post collection sorting; and
3) A DRS (with different material scopes considered).

CETA comments that Eko-Kom: "emphasises the need to combine at least two of these categories" to achieve targets. The analysis is consequently incomplete and potentially misleading, as a DRS is not considered in conjunction with either options 1 or 2, whereas a combination of intensification and a number of sorting options are considered.

It is worth repeating, as is clearly stated in Eunomia's original report:

> *"it is not suggested that a DRS is the only solution. It can, however, be part of a package of measures intended to facilitate or incentivise separate collections."*

It would, therefore, have been helpful if the Eko-Kom analysis considered a DRS in conjunction with one of the other measures.

When considering the alternative – or complementary – approaches, CETA and Eko-Kom do not provide any indication of the methodology they have used to either calculate the likely costs or the impacts. As such, it is not possible to verify their approach or the validity of their findings.

Of the four alternatives to a DRS considered in the Eko-Kom analysis, two have higher investment costs than a DRS. This is on the basis of a DRS requiring investment of CZK 5.2-5.3 billion. However, there is no indication of what these costs comprise of, or, in this section, recognition that Eunomia calculated much lower investment costs of CZK 2.5 billion. Equally, CETA suggests the annual operating costs of a DRS for metal and plastic are CZK 3.8 billion – more than double Eunomia's estimate of CZK 1.5 billion.

CETA claims that the current system could recycle 39,100 tonnes of PET bottles, "which is only by 5,530 tonnes less than in the proposed" DRS. Even if one accepts the premise of CETA's assertion, they seem to imply that a 14% increase – implied by the gap between what would be achieved under a DRS and their claim of 39,100 tonnes - is negligible. Using an average weight of 31g per bottle, this equates to an additional 178 million bottles per year.

3.2.1 Intensification

CETA suggests that targets could be met by "further intensifying the already established waste management system" – including door-to-door collections in places and a denser frequency of containers. However they do not indicate what the costs of this would be, or, for instance, recommend a maximum interval between the collection containers. CETA asserts that door-to-door collections would "ensure in these locations almost 100% deflection of collected waste from the municipal waste", however there is no evidence from other countries to corroborate such an optimistic assumption. For a start, some beverages in bottles or cans will be consumed 'on-the-go', i.e. neither at home or in a commercial premises.

The CETA report appears to take for granted "the willingness of the population to use" the network of recycling containers and neglects the financial incentive inherent in the DRS. Chart 15 indicates the decreasing distance between containers and places of residence – which is now reduced to 92 metres – but the more pertinent question is what impact has this trend had on recycling rates; this unfortunately is not shown in the chart. As noted in the Eunomia report, Eko-Kom increased the number of containers by 22% in one year to 144,500, but this only coincided with a 1% increase in the separation rate.

3.2.2 Additional Sorting

CETA also relies on post-collection sorting, suggesting that a metal target can be "largely solved by magnetic separation" and referring to "simple additional sorting of suitable fractions of recoverable waste from the mixed municipal waste". This does not, however, necessarily meet the requirements for separate collection in both the SUP Directive and Article 10 of the revised Waste Framework Directive. Nor is there any comment on the cost of sorting machines at waste incineration plants.

It is not clear from the information CETA provides whether their suggested approach would contribute to the recycled content targets in the SUP Directive. Conversations with producers indicate that PET collected by a DRS is highly sought after because food contact materials necessarily require a higher-grade of rPET and a DRS reduces the risk of contamination.

3.2.3 Economic Instruments

Elsewhere, CETA seems to imply that increasing landfill charges will make a substantial different to meet recycling targets. While this could help as part of a wider package of measures, the evidence from other countries is that nether a landfill tax nor a landfill ban will, by itself, be sufficient, particularly as it would not deter incineration or littering.

4.0 DRS Principles

4.1 Impacts

CETA claims that Let's Deposit presents two effects of a DRS:

1) Beverage bottles will use clear PET; and
2) Higher recycling rates due to the increase in collection.

The Eunomia report does not indicate that all PET is clear (this is discussed in more detail in Section 5.6), while the second effect seems to be an over-simplification and under-values the benefits of the increased collection. Indeed, the increased collection in a DRS is largely (but not exclusively) attributable to the incentive provided by the deposit – something that is not commented on at all by CETA.

There appears to be some fundamental misunderstandings about the concept of a DRS in CETA's report.

Firstly, CETA claims that the DRS is presented as collecting 44,630 tonnes of PET bottles "i.e. by 5,530 tonnes of PET bottles more than the existing system". In fact, Eunomia's report was based on evidence from Eko-Kom that 32,148 tonnes is collected in the current system – meaning a 12,482 tonne increase.

Secondly, CETA implies in section 4.1.1 that 44,600 tonnes is presented as the maximum that could be collected under a DRS, meaning that if (as INCIEN estimates) 56,200 tonnes are actually placed on the market (rather than the 49,446 tonnes in Eunomia's report), the DRS would only collect 79%. Eunomia's modelling, however, was based on a 90% return rate, as there is no practical limit to the amount in tonnage terms that a DRS can collect. If it had been assumed that 56,200 tonnes were placed on the market, Eunomia would have modelled the collection of 50,580 tonnes (i.e. 90%).

Thirdly, CETA seems confused as to why 46,324 tonnes would be recycled if a DRS were introduced, when the DRS is only modelled to collect 44,630 tonnes. This is because, having assumed a 90% return rate, 10% of PET beverage bottles remain in the existing waste management system or are littered, and consumers forego the deposit refund. Some will go to landfill but some will be collected separately in the containers and could be recycled with other packaging (in this case, an estimated 1,694 tonnes). It is therefore inaccurate to claim in section 4.2.2 that "only 6.3% of deposits will not be refunded".

It is worth reflecting on CETA's statement that:

> *"Changing the discourse in waste management means, from a regulatory point of view, a non-conceptual step that devalues the investments made and thus sends a negative signal that the new strategy may change again in the future, thereby demotivating the involved subjects from building a good infrastructure."*

There is no rationale for this assertion and a DRS does not necessarily prevent or undermine investment in complementary waste management services. As CETA and Eko-Kom seem to acknowledge, the existing system cannot by itself achieve the 90% target so a new strategy will be needed in some form. As such, it could equally be argued that a decision to invest in additional bring-sites could later be superseded by a decision to invest in door-to-door collection vehicles, or vice-versa. A DRS arguably does not "change the discourse in waste

management" but seeks to supplement existing services to maximise recycling rates – that, after waste prevention – should remain the overall objective of any waste management system.

4.2 Return Rate

Eunomia agrees with CETA that "the introduction of a deposit scheme does not automatically mean achieving the target of 90% of collected PET bottles". Their statement that "there is no reason to automatically assume that the Czech PET bottle backup system would behave in the same way as in the six best countries, and not as the six worst countries", however, overlooks the analysis in the Eunomia report of the different design options and the comparison of features associated with a high return rate with those associated with a low return rate. Eunomia's report recognised that some DRSs do not even achieve a 50% return rate and recommended a design based on best practice elsewhere. Consequently, it is assumed that the proposed system achieves a 90% return rate, not "automatically", but because it selects design features from the best-performing systems and explicitly rejects the design associated with the "worst countries".

CETA highlights the limited number of countries that do achieve over 90% and these all, generally speaking, share the key characteristics of the design proposed by Eunomia: they are all based on the return to retail model; they all have relatively high deposit values (compared to systems with lower return rates); and most of them have centralised organisational structures. While CETA claims that the German DRS is a "great inspiration", it is not presented as such in Eunomia's report: Germany's high deposit and fraud prevention costs are not considered justified for the Czech Republic; its decentralised approach does not promote transparency and accountability or economies of scale; and making retailers the material owners, as in Germany, is explicitly rejected in Eunomia's report.

Additionally, in expressing doubts about the ability of a DRS to achieve a 90% return rate, CETA has chosen not to comment on the existing refillables system in the Czech Republic, which achieves well over 90%.

4.3 Funding

CETA is right to highlight the potential for "perverse system motivation" as a result of the system benefitting from any unredeemed deposits. This is why Eunomia's report emphasised the need for statutory targets and the benefits of a beverage container tax that incentivises producers – who own the DRS central system operator in Eunomia's proposed design – to exceed targets. As an additional safeguard, it could, in principle, be stipulated that the system only keeps unredeemed deposits if it surpasses a specified minimum return rate by a specific time. Such an approach has not, however, proved necessary in the existing European systems that have made demonstrable efforts to increase their return rates.

The second consequence of this financial arrangement, according to CETA, is that "the system becomes financially troubled because [an increased return rate] will reduce the revenue from the not recovered deposits". According to CETA, "The difference will have to be compensated by the increase material selling price". The reality, as Eunomia made clear in its report, is that net costs (after accounting for unredeemed deposits and material

revenues) are covered by producer fees – a flexible source of income that avoids the financial fragility implied by CETA.

Producer fees are entirely ignored throughout CETA's report. The system would not be unstable, as producer fees can increase to compensate for a fall in unredeemed deposits. While CETA could have chosen to comment on the fairness or affordability of such fees for producers, it is not an issue they have addressed at all and have instead suggested, falsely, that the system is inherently unstable. As the system is owned by a producer-led organisation, the system operator has the incentive and control to continually improve efficiencies in order to minimise producer fees.

CETA has both rejected the premise that the system will achieve a 90% return rate *and* claimed that the system will be financially unstable if the return rate is too high; it is worth noting that both these arguments cannot be simultaneously correct.

5.0 DRS Costs & Financing

CETA states that:

> *"On the basis of detailed analysis of projects in waste management, it is possible to assume that the proposed cost structure is significantly underestimated, i.e. it does not correspond to reality and thus distorts the forecast economic result of the system and its self-sufficiency."*

This seems to suggest that they are comparing Eunomia's costs to general waste management projects. However other forms of waste management are not necessarily representative of a DRS. CETA explicitly contrasts Eunomia's findings with a DRS study in Slovakia, and this is discussed in more detail below.

5.1 Slovakia Comparison

CETA's commentary on the costs of the DRS focuses on the initial set-up costs rather than the annual operating costs and compares Eunomia's findings on the set-up costs to estimates for Slovakia in a study by the IEP. All DRSs, however, are slightly different and at this early stage in the process, costs are necessarily indicative estimates so modelling methodologies and assumptions will vary. One factor that CETA does not seem to consider, however, is the potential for economies of scale in the Czech Republic. Other potential differences include the volume of beverage sales (a factor in addition to the population and geographic area of the countries) and whether premises for the system operator and counting centres are assumed to be bought up-front or, as in the Eunomia study, rented.

The IEP appears to be modelling a different type of system for Slovakia, given that their proposed handling fees are higher for retailers providing a manual service than for retailers with an RVM. By contrast, Eunomia's study recommended higher handling fees for RVMs to both recognise the additional cost of these and to incentivise their use, given that they reduce the overall operational costs through providing on-site compaction, thus improving transport efficiencies.

Eunomia's costs are based on discussions with existing central system operators. It is of course possible that the actual costs in the Czech Republic will vary in reality, but it is

important to remember that the investment costs in Eunomia's modelling are spread over 5 years (counting centres) and 7 years (central admin), with the costs in one year distributed between 1,731,000,000 containers. Consequently, the impact on the producer fee per container is not necessarily as significant as might first be thought.

While a like-for-like comparison of the two studies is less straightforward than CETA seems to suggest, it seems odd that CETA chose to focus exclusively on set-up costs and not to compare the on-going operating costs of the two modelled systems. Gross annual operating costs in the Czech Republic are estimated to be 73% higher, which seems to be more in line with the difference CETA would have expected. For many, the key indicator of a DRS, and the prime determinant as to whether it is affordable, is the net cost per container placed on the market – i.e. the producer fee. While there were differences between the IEP and Eunomia fee for PET bottles (€0.015 in Slovakia compared to €0.0078 in the Czech Republic in the PET and metal scenario), the fees for cans were remarkably similar (€-0.005 and €-0.0052 respectively).

5.2 Transport Costs

CETA wrongly states that Let's Deposit assumes traffic costs "can be ignored". If this were the case, it is not clear why the results tables in section 7.3 of the Eunomia report list transport costs of €8.5 million and €9.1 million, or why the Technical Appendix details the process and assumptions for modelling in the "Logistics and Costs of Collection" and "Haulage".

Indeed, CETA elsewhere acknowledges Eunomia's vehicle costs, suggesting they are lower than road freight vehicle costs. The costs were obtained from a local source and the description of "road freight vehicles" suggests that CETA may be anticipating larger, more expensive vehicles, than those used in the modelling.

There are a number of inaccuracies and misleading claims in CETA's statement that:

> *"Eunomia envisages that consumers, manufacturers and other involved subjects would be able to handle most of the traffic on a regular journey, so that there would be no increase in traffic. It is important to realize that all transport cannot be performed in this way.*
>
> *Especially when collecting hand-picked PET bottles. The same driver who brings the goods cannot take back empty and contaminated PET bottles into the cargo bay. It is a waste that cannot come into contact with food and other goods."*

Firstly, it implies that Eunomia used reverse logistics in its modelling, whereby distributors take-back returned used containers when they deliver new stock. While this was discussed in the report as an option – as such arrangements do exist in some DRSs – Eunomia did not include any backhauling in the modelling and instead assumed that the system operator purchases its own vehicles and organises its own collections. The results consequently reflected both the financial and environmental effects of this.

Secondly, a common concern raised by opponents of a DRS is the hygiene implications. However these are often over-stated and ignore how DRSs work perfectly well in other European countries. CETA also ignores, once again, that back-hauling is considered a viable option in other countries.

Thirdly, in terms of consumers, the intention behind the return to retail model is to enable consumers to return their used containers when they do their shopping – avoiding any additional journeys. Eunomia's modelling does, however, assume that a small proportion of consumers will make a special journey explicitly to return their used containers. While no DRS would factor in the economic cost of this, Eunomia's environmental modelling does include additional transport emissions for these journeys.

5.3 RVMs & Manual Returns

5.3.1 Number of RVMs

CETA implies that Eunomia under-estimated the number of RVMs needed:

> *"Norway, which sets a notional example, has 3,500 reverse vending machine collection points (RVMs) for its population of roughly 5.3 million. The Deposit Initiative envisages 3,808 RVMs for the Czech Republic."*

While population is undoubtedly one consideration, so too is population density, the number and size of shops and the expected through-put of the RVMs. Eunomia calculated the number of RVMs on the basis of a reasonable through-put per RVM, so concerns about possible queues at machines are over-stated. Undoubtedly, though, there is potential to have more RVMs in the Czech Republic. The effect of expanding the use of RVMs – providing each RVM still had a reasonable through-put and was not under-used – would be to reduce the annual operating costs of the DRS. While RVMs add to the initial investment costs, the resulting reduction in transport costs and, most likely, fraud losses, produce net gains.

CETA repeatedly emphasises that 80% of retailers do not have an RVM and, at times, it seems this could possibly have been misinterpreted to mean that a similar percentage of beverage containers are returned manually. This is not, however, the case; for instance, in Norway, there are approximately 12,000 return locations but only 3,700 RVMs and over 90% of containers are returned via RVM. Eunomia has assumed that 27% of containers are returned manually. As the system develops, the proportion returned to RVMs and the number of RVMs is likely to increase further. In the Estonian DRS's second year in 2006, only 20% of containers were returned to RVMs but this proportion had increased to 94% by 2018.

While in places CETA suggests that Eunomia has not included enough RVMs, in other places they seem to imply that all retailers may be required to install RVMs, as they rightly highlight that it can be difficult for small retailers in particular to make space for RVMs. This is why Eunomia assumed that small retailers would not have an RVM and why the handling fee has been designed to compensate all retailers for their lost retail space – whether that is to accommodate the RVMs and/or to store the returned containers.

5.3.2 Cost of the RVMs

CETA seeks to compare the cost of an RVM in Eunomia's report to estimates from Eko-Kom and IEP in Slovakia, although it is not clear why they did not provide a cost per unit for Slovakia (€28,800 – €30,600) to enable direct comparisons with Eunomia's figures of €20,000 – €28,500. As such, while the Eunomia estimates are lower and this will reduce the costs of the system, the differences have arguably been somewhat exaggerated. CETA goes on to suggest that:

> *The lower costs in the Czech Republic may be explained by a plan to buy machines with limited functionality, such as compacting (sic) machines for PET beverage containers and cans. Of course, this will be reflected in both handling and transport costs, which will be significantly higher. Transport of not pressed PET bottles and cans will be more logistically demanding because they are larger than the compacted PET bottles and cans.*

This, however, ignores the fact that Eunomia has clearly stated that compacting RVMs are assumed to be used and the resulting bulk densities for storage and transport purposes are provided in the Technical Appendix.

5.3.3 Implications of RVMs

CETA again raises hygiene concerns by asserting that:

> *"there is a risk of biological processes associated with bacterial proliferation, mould, fungi, etc. When the bottle is pressed in the RVM, there is a risk of loosening some of these contents"*

They do not, however, provide any evidence from other countries to indicate that this is a problem in reality. It also potentially ignores the fact that Eunomia's modelling included staff time, and the associated costs, for cleaning RVMs, many of which are specifically designed to be easily cleaned.

Additionally, CETA claims that heavier PET bottles will be needed so that they can be processed by the RVMs because the "collapsing" of thinner bottles "makes it impossible to check them efficiently and to pay the deposit". There is no evidence or source to support this claim, so it is not clear on what basis it is made. Modern RVMs only need to be able to scan the barcodes and check the weight and dimensions of the bottles; once the bottle has been verified, the RVM compacts it.

Elsewhere, CETA refers to a "crisis scenario" if an RVM breaks down. While RVMs can, like any technical equipment, break down, this is not an insurmountable problem in other countries or for the existing RVMs for refillables in the Czech Republic. Modern RVMs are designed to minimise down-time – especially because some manufacturers are paid on a through-put basis so will lose income if their machines are not operational – and some faults can be diagnosed and fixed remotely. If an RVM is unavailable, and the retailer only has one machine, they can simply take back containers over the counter temporarily. So, while there are potential inconveniences, it seems an exaggeration to describe this as a "crisis".

5.3.4 Manual Returns

Perhaps because they over-estimate the number of containers returned manually, the CETA report seems to exaggerate any issues related to manual returns. For instance, the say it is a "crucial question" whether the bags for holding manually returned containers are single-use or reusable. While this is a valid question and reusable bags would be more in line with waste prevention, presenting it as a "crucial" question arguably over-states the point when discussing a system that is designed to recycle over a billion plastic bottles and hundreds of millions of metal cans each year. It is also a question that was answered in the Technical Appendix, where Eunomia made clear that the bags were single-use (so that cost estimates

are conservative by assuming more bags have to be bought). The Eunomia report also provided detail as to the number of bags that would be needed in a year and the cost of these.

CETA goes on to state that "It can be assumed that about 15 to 20% of the total weight of the transported PET bottles will be represented by the bags for their storage", but they do not provide any evidence for this assumption, which seems excessive.

5.4 Education

CETA states that:

> *"Extension of the existing system does not require such high investment in education and other costs associated with switching to another system. The need for training for the introduction of a deposit system is confirmed by the findings in Eunomia study, which does not count on 90% of collected PET bottles after the system is in place."*

They also recognise in section 3.1 however, that intensification of the current system would require "continuous education and information to the population" but, as the costs of this have not been quantified, it is difficult to make comparisons. Eunomia included education costs in the system operator's expenses, so these costs would be covered by the system operator and, ultimately, producers. It is not, however, clear who would be responsible for awareness campaigns and the costs of these in intensification of the current system.

In terms of the time needed for consumers to fully understand the DRS and to become accustomed to returning their used beverage containers to shops, it is worth noting that Lithuania achieved a 92% return rate in only its second year.

5.5 Funding

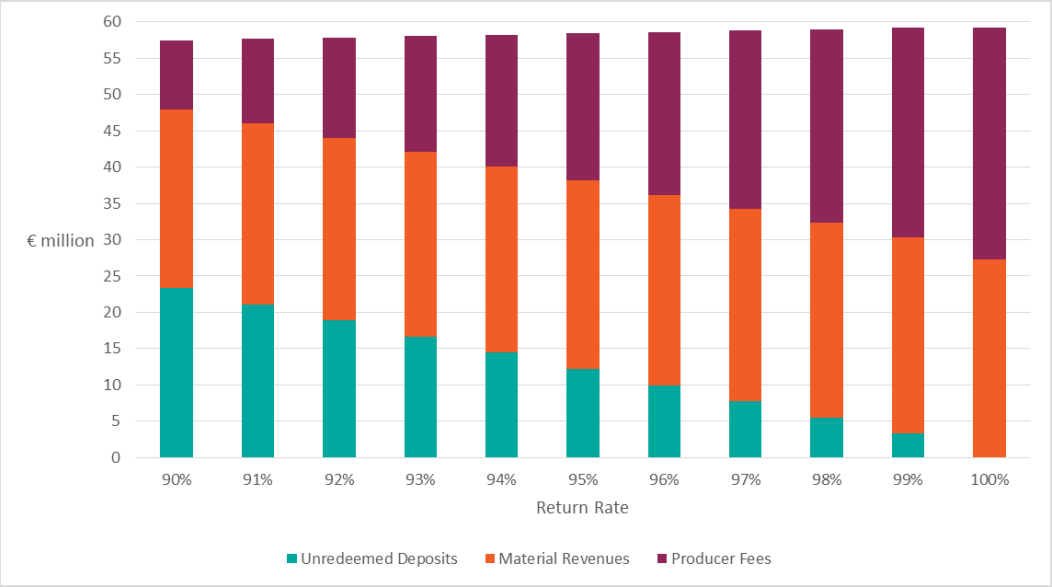
CETA warns that the "financial sustainability of the system under different development scenarios" has been "insufficiently discussed". They are right that, before any DRS is introduced, more detailed logistics planning will be needed and costs can be more accurately calculated once the sites and/or premises (for the system operator and counting centre) have been identified. If they sign up to join a central system, individual beverage companies can also provide more detail on their beverage sales, historic trends and market projections on a confidential basis. As such, Eunomia's study represented the first stage of the process.

While CETA's analysis, understandably, focuses to a significant extent of the costs of a DRS, it is surprising that they make no mention at all of producer fees. Eunomia had included the set-up costs to be transparent about the investment required but made clear that this would re-paid over several years and explained how this would be funded on an annual basis. Simply focusing on the investment costs out of context, as CETA seems to do, risks creating undue alarm about the affordability of the system.

KMV has more recently commissioned further analysis of the impact of increasing return rates, the results of which are summarised in Figure 5-1. This indicated that, at a theoretical 100% return rate, the total annual costs only increase by 3% compared to a 90%; the proportion of costs paid by producers does, however, increase to 54%, meaning an average

producer fee of €0.017 per container placed on the market, which would still be lower than some producer fees in existing European DRSs.

Figure 5-1: Annual Costs and Sources of Funding at Different Return Rates



5.6 Material

As indicated in Section 4.0 above, a fundamental weakness of the CETA report is that it implies all the Let's Deposit studies "ignor[e] the real colour portfolio of PET bottles placed on the market", apparently meaning that both the assumed recycling rate and the material value are too high. As a result, CETA suggests that

> *"If one wants to use a more realistic income estimation a combined calculations should be used, which would use a weighted average of the price."*

This once again adds to the impression that Eunomia's report has not been considered in its entirety. As explained in Appendix A.3.6, Eunomia used a PET value of €397 per tonne, which was a weighted average based on the market share and value of each colour group. The table below is Table A 15 from Eunomia's report, which shows that Eunomia used the same market shares provided by Eko-Kom that CETA cited in its report.

PET type	Material revenue, € per tonne	Market share, %
Transparent	€ 550	38%
Blue	€ 340	35%
Green	€ 340	15%
Brown, Orange	€ 195	5%
Colour Mix	€ 117	7%
Overall	€ 397	N/A

It is therefore inaccurate to say that Eunomia used "the expected price of CZK 10,000 [€397] per ton of recycled material regardless of the colour. This is a standard price… of the clear (colourless) PET". The standard price of clear PET is €550.

CETA cites prices in Germany to suggest that Eunomia's values are too high. However, they do not provide a source for this information. The prices in Eunomia's report were provided by reprocessors in the Czech Republic, so are representative of current prices at the time the report was written. The material returned via a DRS is generally of a higher quality and less contaminated, however, the prices were not inflated to reflect this. It is not clear if the German prices are for DRS-PET specifically or for all PET, although the assertion that 10-35% of material in Germany is contaminated would indicate that it is the latter. In any case, the German DRS has a different ownership model whereby retailers own the material and are responsible for its sales, so may not necessarily be able to secure the best prices if they are not marketing it on a national scale.

Indeed, CETA reports that the PET is processed "to be ready for further use alike the sorted material from yellow collection containers". This is not necessarily the case, however, as material collected at bring-banks may not be of food-grade quality so cannot always be used to manufacture new beverage bottles, as the DRS material could be.

Finally, CETA does not take into account the scope of the DRS to incentivise the use of clear PET by charging a higher producer fee for coloured bottles. This happens in Sweden, where nearly 90% of PET bottles are clear. As explained above, however, Eunomia did not make any assumptions about producers' decisions or change in behaviour and instead uses the same market shares as at present. Similarly, CETA notes that PVC sleeves on bottles "significantly reduces their recycling", but it was again recommended that producer fees be structured to deter the use of sleeves and some DRSs, such as Norway, do not permit the use of PVC.[4]

6.0 Additional Impacts

6.1 Recycling Rates

CETA is concerned that "Redirecting investments to meet the SUP would hamper investment in meeting CEP goals, thereby complicating their achievement." While beverage containers may represent a small percentage of packaging overall, they do nevertheless contribute to the more general packaging targets, which will be supported by higher return rates under a DRS. The scope of the DRS could also be expanded to include glass, cartons and HDPE to further support glass, paper/ cardboard and plastics targets.

6.1.1 Municipalities

A key theme in CETA's report is the impact on existing waste services, with the assertion that:

[4] https://infinitum.no/file/10/d76f5cbeb26620a83c7cb0293f81bf23/161115_Ny_Tech_Spec.pdf

> *"it is clear that a significant portion of the plastic waste being diverted into the dual system will represent a significant loss of municipal income."*

CETA suggests the Let's Deposit initiative "does not pay attention to these discussions" relating to lost income from material revenues. However this was quantified and discussed in Section 7.1 (Impact on Existing Waste Services) of Eunomia's report. It is surprising that CETA does not appear to have given any consideration to Eunomia's analysis of the financial impacts in terms of:

- Staff collection costs savings;
- Vehicle collection costs savings;
- Bulking and hauling cost savings;
- Disposal cost savings;
- Material revenue losses; and
- Reduced income from PRO fees for Eko-Kom.

Indeed, Eunomia's findings are overlooked when CETA states that removing bottles from yellow containers will lead to "lower transport performance". Nor is it clear what their rationale is for saying containers cannot be collected less frequently because of "hygienic reasons".

CETA suggests that diverting the beverage containers away from existing sorting lines may mean some lines have to close, but they do not comment at all on the potential to increase the collection and recycling rates of other forms of packaging – something the Czech Republic will need to do to meet other targets.

Indeed, CETA elsewhere acknowledges that "in order to meet CEP objectives, the existing lines need to be operational and their network needs to expand gradually", so they recognise that the capacity is needed for packaging other than beverage containers. They go on to say that "it will be necessary to obtain funding from other sources if the deposit return system is to be introduced." It is not clear what the sources of funding would be to expand the lines even without a DRS, unless CETA is implying that the funding would be wholly dependent on beverage containers.

CETA states that:

> *"Payment by authorized packaging companies to municipalities for sorted waste constitutes a significant income item for the municipalities and cities, which effectively reduces fees for waste management paid by households to the municipalities."*

The implication is that the fees municipalities charge householders will have to increase. But under the new Waste Framework Directive, it is producers who are liable and EPR fees may well have to increase to cover the full net costs of separately collecting, sorting and treating packaging waste.

6.1.2 Germany Comparison

According to CETA:

> *"With the introduction of a deposit system, there is a risk of a decline in the willingness to sort other wastes. This phenomenon has occurred; for example, in*

neighbouring Germany, where the sorting rate of plastic decreased by 11 percentage points."

However, CETA provides no evidence to link the reported decline in the sorting rate to the DRS; a correlation is not proof of causation. It is worth noting that Diagram 16 in their report, showing "a clear drop of the recycling rate of plastic packaging waste after 2003, when the PET bottle deposit-refund system was implemented in Germany" does not show any results before 2003; it would have been more informative to put the reported decline in the context of immediately preceding and longer-term trends. Nor is it clear why CETA chooses to focus on one year and not the steady increase in the recycling rate since 2004. Germany has the third highest packaging recovery rate of the EU-28 (97% in 2016)[5] and the highest municipal waste recycling rate in the world.[6]

Although CETA directly and solely links the decline in 2003 to the introduction of the DRS, there are a number of factors that could have contributed to this, not least incineration prices dropping close to zero, so much of the packaging recovered through other methods was incinerated rather than recycled. Indeed, there is still a significant gap between Germany's recovery rates and recycling rates. Additionally, the German DRS was partly intended to promote refillables, which would not be properly accounted for in the recycling rates as reported.

6.1.3 Kantar Survey

On a number of occasions, CETA quotes an opinion poll which indicated that 3% of respondents would limit their sorting of other waste if a DRS is introduced. There is, however, little acknowledgement of the remaining 97% and no consideration at all that, at least for a proportion of this 97%, the DRS could have the opposite effect by encouraging additional sorting. Indeed, in Lithuania, 93% of consumers reported that the introduction of a DRS had meant they were more likely to consider sorting all their waste more responsibly.[7] While it is reasonable to suggest that a small proportion of consumers could be negatively affected (because they expect a financial reward for sorting all their waste), there is also evidence that a DRS can have the opposite effect a – positive impact – on a far higher proportion of the population.

Other results from the opinion poll, which CETA chose not to comment on, include:

- 98% of people who buy beverages in refillable bottles return the bottles (which would seem to support the argument that a DRS is a viable option for the Czech Republic);
- 83% welcome the idea of a returnable system for PET bottles, and 76% for cans (indicating that the majority of the population would support the introduction of a DRS);

[5] Including Finland, which reports a 109.8% recovery rate. https://ec.europa.eu/eurostat/statistics-explained/index.php/Packaging_waste_statistics#Recycling_and_recovery_rates

[6] https://www.eunomia.co.uk/reports-tools/recycling-who-really-leads-the-world/

[7] USAD (2018) Lithuania's Deposit System. Presentation to the 1st European Conference on Deposit Systems for Beverage Containers. 20th November 2018.

- 90% expect a DRS to reduce waste in nature (so the vast majority of respondents believed a DRS would reduce littering); and
- If the deposit was CZK5, 98% would return their bottles/ cans; if the deposit was CZK 3, 93-96% would return their cans/ bottles (supporting Eunomia's hypothesis that a deposit of CZK 3 would support a 90% return rate).

Including some of the other opinion poll findings in CETA's report could have provided a more representative picture of the survey results. Indeed, CETA raised concerns about whether consumers would have space in their homes for the containers, but Kantar specifically asked about this and only 7-9% reported that it would be a major problem, with at least half saying it would not be a problem at all.

6.2 Retailers

6.2.1 Costs

In a return to retail model, retailers are a central part of the DRS, but it is not clear why CETA has chosen to rely on a study from 2008 upon which to base its claims while ignoring substantial parts of Eunomia's analysis. This 11-year old study indicated that 96.7% of investment costs and 88.1% of operating costs are paid by retailers, and both the total investment and operating costs are significantly higher than the costs calculated by Eunomia. CETA does not, however, seek to compare them and simply states that "It can be assumed that a similar phenomenon of cost allocation will also occur in the Czech Republic".

Firstly, Eunomia's report makes clear that RVMs represent the majority of the initial investment costs, which are assumed – in this model – to be paid for initially by retailers. Eunomia's report goes on to explain in some detail the additional space and staff costs that would likely be incurred by retailers. In focusing on the 2008 study, CETA has not indicated whether it agrees or disagrees with Eunomia's cost estimates. More troublingly, CETA's report misleadingly implies that the costs are borne by the retailers, whereas Eunomia makes clear that retailers receive compensation in the form of a handling fee for every container taken back. This handling fee is intended to cover the average costs of retailers with an RVM and retailers without an RVM and, in Eunomia's analysis, it is clear that these handling fees represent the majority of the system operator's costs. CETA on page 45 does refer to "the so-called handling fee", but such phrasing seems unnecessarily dismissive and CETA gives no further information on it.

Secondly, judging by the title listed in the sources at the end of the report (it is not clear in the report itself), the 2008 study related to Germany.[8] If this is the case, it should be noted that Germany does not have a centralised system and, unlike other European systems, retailers are not paid a handling fee. As discussed in the Eunomia report, retailers in Germany are instead the material owners so rely on this as a source of income.

CETA reports that

[8] Berger, R. (2008) *Experience with the introduction of a mandatory deposit system in Germany.* Presented at PRO EUROPE Deposit Workshop.

> *"As a result of the deposit payment, the waste becomes de facto a kind of valuable that requires specific handling, staff training, security, storage in secure areas, but separate from food, etc. It is clear that this aspect will increase the level of administration and real storage requirements for traders."*

While this is true, it seems to over-state what is needed and the implication is that this is more challenging than it seems to be for retailers in other countries with an existing DRS. Moreover, once again, no consideration is given to the handling fee that is designed to compensate retailers for their costs.

CETA rightly highlights that the impact on retailers' cash-flow should be considered. In Norway, the system operator is able to reimburse retailers with an RVM twice per month, while it can take longer for retailers without an RVM due to the additional time needed to count the containers and process the data. As such, it can take up to two months, but retailers without an RVM are likely to receive lower volumes.

6.2.2 Small Retailers

CETA reports that

> *"Small shops will face several cost shocks after implementing the deposit return system. These will be caused mainly by increased administration, increased requirements for personnel in the operation, requirements for securing the collected material, and the necessity to define space for the material storage."*

This once again overlooks the handling fee and could create more concern than is justified. In arguing that there could be long queues in small shops, CETA has chosen not to reflect on the evidence in Eunomia's study, which cited small retailers reporting that the deposit system is "good for business" or to consider that tourists visiting shops to claim their deposit may be considered a positive thing, because the tourists might then also buy something.

Elsewhere, CETA suggests that, if small retailers are not included in the system and consumers return containers to supermarkets, this will drive customers away from small shops. This is one reason why Eunomia recommended that small retailers be included in the system but it also seems to be jumping to contradictory extremes for CETA to suggest that small retailers will be inundated by consumers if they opt into the system and lose customers to larger shops if they opt out.

CETA comments that:

> *A side effect of the deposit-refund system is a strategic decision of which packaging will be offered by the shops (i.e. which packaging will have to be repurchased pursuant to the legislation). Present practice shows that after implementation of the deposit-refund system, the beverage manufacturers consolidate the brands in shops, which results in a limited offer in the individual beverage segments (premium beverages, middle class, cheap beverages).*

They do not appear to provide any evidence to corroborate this claim and it is not clear what their reasoning is, given that Eunomia makes clear that shops should take back any containers, not only the type of container they sell (because this is simpler for both retailers and consumers and would avoid such unintended consequences).

CETA says there are "further questions, e.g. how to treat HoReCa (hotels, restaurants, coffee houses and other catering facilities", but this again was an issue that was specifically addressed in Eunomia's report.

6.3 Households & Consumers

There is a possibility, as CETA implies, that producers pass on their producer fee to consumers by incorporating it into the purchase price of the beverage:

> *"The cost of implementing and operating the system will be passed on to customers, which will be reflected in the rise in beverage prices."*

This does not, however, seem to take account of the EPR fees currently paid by producers and the requirement in future for full cost coverage in respect of all packaging. Additionally, Eunomia found that the producer fee for an aluminium can would be lower than the existing EPR fee and that the deposit system may in fact 'pay' producers for the aluminium. CETA does not suggest that beverage prices could fall as a result.

6.4 Littering

As discussed in the Eunomia report, litter reduction can be a prime reason for introducing a DRS, with past research indicating that a DRS could reduce the littering of deposit-bearing beverage containers by more than 95%.[9] CETA does not reflect on the evidence, but instead claims that "The implementation of deposits does not even address littering." CETA does not provide any research to support this or to dispute the evidence from studies in the USA on the reduced littering of deposit-bearing containers, but instead provides a number of scenarios in which a beverage container could still be littered.

Firstly, it is not claimed – as CETA's argument seems to presuppose – that a DRS means no beverage containers are littered. Secondly, CETA does not consider the possibility that, even if a deposit-bearing container is littered because the original consumer is not motivated to find a bin or redeem their deposit, someone else will pick it up in order to claim the deposit.

They do acknowledge this motivation elsewhere in the report, commenting that, in Sweden:

> *"it was necessary to distribute a system of transparent collecting containers in parallel to the existing litter bins to avoid this activity. Various groups of residents motivated by a vision of received refunds searched litter bins and other waste collection containers to get deposit packaging, which led to throwing the content of containers out. The result was waste scattered around the containers and wind-blown down the streets. The city administration responded by the distribution of a network of containers for PET bottles and cans in parallel to the standard litter bins."*

While it is certainly conceivable that some people will look through bins to find deposit-bearing containers, CETA unfortunately does not provide a source to indicate that this creates additional litter or that the parallel containers resulted from this – rather than

[9] Eunomia (2017*) Impacts of a Deposit Refund System for One-way Beverage Packaging on Local Authority Waste Services*. 11th October 2017

reflecting a positive decision to provide more opportunities to increase the return rate. It should also be noted that Returpack, which runs the Swedish DRS, has offered the containers or "pipes" alongside litter bins to municipalities, into which used beverage containers can be placed by those who do not wish to redeem their deposit at no cost.[10]

CETA disputes the estimate of the amount of beverage containers that are littered, which was based on analysis by INCIEN. Rather than providing evidence that more beverage containers are actually recycled or landfilled, CETA suggests the estimate cannot be accurate because, if it were, every beverage container that has been littered during the past twenty years should be visible:

> *With the idea that 1 832 tons of PET bottles remain in nature every year during the last 20 years, then there would be now 20 * 1832 = 36 640 tons of PET bottles. If we consider the weight of an average PET bottle being 30 g, which is in accordance with the initiative's calculation, then 1.221 billion PET bottles would have to be found in the Czech Republic. The Czech Republic has an area of 78,866 square kilometres, and when calculating with such a number of PET bottles for a given area, we conclude that at any point in the Czech Republic with an area of 10 x 10 meters, including fields, forests, water areas, built-up areas, roads and roofs, mountain slopes, sports fields, etc. should be two discarded PET bottles. The eye of a human 170 cm tall can see at a distance of about 4.7 km, but it can focus and recognize objects at a distance that is several times shorter. If we accept the idea that one can distinguish objects within 50 meters of the observation site, according to the initiative's calculation, there should be 157 PET bottles thrown in the area of the circle around the observer at any location in the Czech Republic (7854 m_2).*

This does not appear to be a sensible suggestion, given that it is known how plastic can be carried away in watercourses and breakdown. There is a "rubbish island" or "trash vortex" in the Pacific Ocean – this is not items that were consumed and discarded in the middle of the Ocean but is an accumulation of litter from all over the world, just like litter is washing up on beaches hundreds of miles from its country of origin. While the Czech Republic is of course land-locked, this does not mean its rivers cannot transport discarded bottles and cans, or indeed hide bottles that have become entangled or weighed down and lie on the riverbed. It is also possible for a bottle or can to be picked up many years after it was originally littered, but by this point it has already caused environmental harm.

6.5 Beverage Market

CETA warns that a DRS could distort the beverage market:

> *Consumers will prefer other types of packaging materials (e.g. Tetrapack, lightweight glass, plastics for which the deposit is not paid, etc.) for activities that expect generating of waste without the possibility of collecting the deposit back (e.g.*

[10] http://www.mynewsdesk.com/se/pressreleases/haelften-av-landets-kommuner-har-pantroer-nu-erbjuder-pantamera-alla-kommuner-att-testa-2577747

mountain hike). This fact will not reduce the risk of littering, it only transforms it into another form.

However, it is questionable whether people who are not motivated to carry an empty plastic bottle home would be more motivated to take a glass bottle (likely to be heavier) or carton (possibly bulkier) just so that they do not lose CZK 3 or have to carry the bottle back to a shop.

Even if the premise is accepted, a solution to this particular problem would be to include all container types within the scope of the DRS, so that a deposit is charged on them all. Alternatively, a beverage container tax could be applied, which is likely to increase the cost beverage containers outside the scope of the DRS.

CETA's report further highlights:

> *"One of risks of the deposit implementation is an overall drop in consumption of packed beverages, especially due to a shift of a part of portfolio to alternate options, which is mainly the tap water, syrups, and home makers of sparkling beverages. In terms of economy, this is a shift caused by a market distortion due to regulations."*

It would be interesting to see any research that supports CETA's assertion that sales would be affected, as they unfortunately did not provide any evidence.