EXECUTIVE SUMMARY

Scoping Study for a Nationwide Deposit Return System (DRS) for Vietnam

The Norwegian Embassy in Hanoi and Innovation Norway, in consultation with Vietnam's Ministry of Agriculture and Environment (MAE) commissioned Eunomia Research & Consulting (Eunomia) to assess a possible design for, and the costs and impacts of, a well-designed nationwide Deposit Return System (DRS) for single-use beverage containers for Vietnam. This report is intended to provide MAE with an evidence base to inform future research and policy development around such a system. Alongside Extended Producer Responsibility (EPR), a DRS in Vietnam offers a potentially significant and effective measure implementing the Government's drive towards a circular economy, as is outlined in Article 142 of the 2020 Law on Environmental Protection.[1] Specifically, a DRS can achieve very high recycling rates and therefore reduce the reliance on raw materials for new products and reduce adverse impacts on the environment, which are aims in Article 142.

A DRS for single-use beverage containers typically applies a small, fully refundable deposit to each beverage container included in the system. This deposit creates a financial incentive for consumers and others (e.g., waste reclaimers) to return used beverage containers to a return location to redeem the deposit. Return locations may include retailers, and hotels, restaurants, and cafes (HORECA), or dedicated return points. The returned containers are usually sent to a counting centre for monitoring purposes and/or a sorting facility to be sorted, before going to a recycling facility to be recycled. The increase in collection rate achieved in a DRS has associated benefits in reducing litter and the loss of materials to terrestrial and marine environments, in reducing greenhouse gas emissions, and in improving local air quality, creating jobs, and increasing the circularity of the materials in scope.

DRSs are recognised as a proven mechanism for achieving very high return rates of beverage containers for recycling. There are over 40 jurisdictions around the world that have a DRS for single-use beverage containers, including in Europe, America, Africa, the Middle East, and Oceania. Particularly well-designed DRSs can achieve return rates of over 90%, and tend to be mandatory.[2] Introducing a DRS creates various jobs, including roles in collection, sorting, and administration. While a common argument made against DRS for single-use beverage containers is that it negatively impacts beverage sales, there is no definitive evidence suggesting that this is the case.

This study considers a nationwide DRS for Vietnam, covering single-use PET bottles and aluminium cans – though the scope could expand to include additional materials over time. Research suggests that around 98% of single-use beverage containers placed on the market in Vietnam consist of PET bottles (33% of total) and aluminium cans (65% of total). While the existing collection rates of these containers are relatively high (believed to be about 50% for PET and 80% for aluminium), the large majority of the material is downcycled into other products. For example, one study suggested that of the aluminium cans recovered in Vietnam, only 1% are exported for closed-loop ("can-to-can") recycling, with the remainder

[1] The National Assembly (2020). Law No. 72/2020/QH14 on Environmental Protection. Available at: https://faolex.fao.org/docs/pdf/vie212027.pdf

[2] Reloop (2024). Global Deposit Book 2022: An Overview of Deposit Systems for Single-Use Beverage Containers. Available at: link

downcycled or disposed.[3] A DRS can capture high volumes of high-quality, food-grade recyclable material for closed-loop recycling.

As Vietnam is socially, economically, and infrastructurally different from the jurisdictions where a DRS has so far been (or is due to be) implemented, it is especially important that a DRS for Vietnam is carefully designed with the specific national context in mind. This includes consideration of the beverage market, existing waste management processes, informal sector, politics, economy, culture, and geography.

While no other Southeast Asian country has yet implemented a nationwide DRS for single-use beverage containers, the system's success in Vietnam could serve as a model for neighbouring nations. By adopting global best practices and lessons learned and tailoring them to local conditions, Vietnam could demonstrate leadership in sustainable development and circular economy practices. A DRS also provides job and business opportunities in the green economy, such as logistics, sorting, administration, and recycling.

Approach and Key Findings

This study consisted of a mixed methods approach, involving reviews of academic and grey literature (e.g., reports and documents by non-government organisations and consultancies), analysing data provided from project partners, interviews with key stakeholders (including representatives of the informal sector), and two workshops. Along with the proposed nationwide DRS, a pilot DRS was also designed and recommended. A pilot could test the key design elements of the DRS, providing valuable lessons learned for the potential nationwide DRS.

The study presented here models one potential outcome of implementing a nationwide Deposit Return System (DRS) in Vietnam. This represents a "central case" estimate, meaning that where assumptions have a range of possible values, the assumptions used for modelling are based on midpoint values — positioned between the minimum and maximum potential outcomes.

While there are uncertainties in some of the assumptions used, and risks around DRS implementation, it is possible to mitigate these through informed DRS design and appropriate supporting policy instruments (see the 'Managing Uncertainties and Risks' Executive Summary subsection, below). The results show that the modelled DRS could produce various environmental, economic and social benefits to Vietnam, as detailed in the subsections below.

DRS Design for Vietnam

In designing a DRS for Vietnam, the study considered how best practice design elements from existing DRSs apply in Vietnam's specific context. It also included bespoke elements that incorporate the informal sector, which is currently delivering much of the country's recycling. The key DRS design elements are summarised in Table E-1.

[3] Roland Berger (2023). Aluminium Cans Market Assessment – Vietnam. No link

Table E-1: Key Design Elements of a DRS for Vietnam

DRS Element	Recommendation	Rationale and Further Information
Container materials	PET bottles and aluminium cans	Around 98% of single-use beverage containers placed on the market in Vietnam consist of PET bottles (33% of total) and aluminium cans (65% of total). It is possible to capture very high volumes of high-quality recyclable material in a DRS. Due to comparatively low consumption levels of HDPE, PP, glass, and liquid paperboard beverage cartons, these are deemed unsuitable for inclusion at the initial stage of a DRS – although additional materials could be included over time.
Container size	150ml – 3L (inclusive)	It is believed that most single-use beverage containers in Vietnam are between 150ml and 3L, with no known beverage containers <150ml and a limited proportion being over 3L.
Beverage types	Exemptions for wine, spirits, and milk-based dairy drinks	The scope of the DRS would include water, soft drinks, juice, beer, cider, iced tea, and other drink types. Import complications associated with wine and spirits, plus a lack of identified wine and spirits in PET or aluminium beverage containers, means they should be exempt. Storing empty milk-based dairy drink beverage containers at return location may lead to hygiene issues, so these should also be exempt.
Deposit level	1,000–2000 VND per container	A deposit value of 1,000–2,000VND per container could result in a return rate of 80–90%. A midpoint deposit value of 1,500VND per container has been modelled, although in practice it would be practical to avoid the now rarely used 500VND note. This rate should be monitored and potentially increased if required. The pilot DRS should provide further insights into a suitable deposit value, if this is pursued.
Consumer returns	Retailers and depots	Using retailers and depots as return locations for consumers would maximise convenience and improve return location coverage. At all return locations, consumers would be refunded the full deposit per returned used beverage container. Retailers would be paid a "Service Fee" per used beverage container that they receive. This would compensate them for receiving, scanning, and storing the containers. Retailers with automated returns (i.e., using Reverse Vending Machines) would receive higher Service Fees per container than those using a manual return approach. This reflects the higher capital and operational expenditures associated with RVMs. However, RVMs contribute to reductions in system-wide expenditures, particularly in relation to collection logistics and counting centre operations. The higher Service Fee thus also functions as a financial incentive to encourage return points, where the scale of containers returned merits it, to adopt RVMs. Depots do not require a Service Fee, since they would be operated and funded by the System Operator.

DRS Element	Recommendation	Rationale and Further Information
Waste reclaimer returns	Registered junkshops	Junkshops would be return locations for waste reclaimers. In order for junkshops to be return locations, they would need to register with the DRS System Operator. At the junkshops waste reclaimers would receive the full deposit per used beverage container (collected from consumers or recovered from bins, litter, or landfill). The containers would need to be uncrushed (i.e., the DRS label being readable) in order for the DRS label to be scanned and deposit to be refunded. Interviews with informal sector stakeholders indicated that waste reclaimers do not typically crush bottles or cans, though further assessment of this may be required. Registered waste reclaimers (i.e., those registered with the DRS System Operator) would receive an additional "Collection Fee" per container in addition to the deposit value. Like retailers, registered junkshops would be paid a "Service Fee" per used beverage container that they receive. This would compensate the junkshop for receiving, scanning, and storing the containers. The junkshop Service Fee would be lower than that paid to retailers due to the estimated lower costs incurred by junkshops.
Legal status	Mandatory	DRS is a form of Extended Producer Responsibility (EPR), since it makes producers responsible for paying the costs of the system to achieve targets set out in legislation. As such, to align with Vietnam's existing mandatory status of EPR for packaging, the proposed DRS in Vietnam should be mandatory for all in-scope producers and obligated retailers, and not voluntary. A voluntary DRS would risk limited participation from producers and retailers, likely resulting in low return rates from consumers. A mandatory DRS, on the other hand, would require all obligated producers and retailers to participate in the system, which may achieve economies of scale to improve system efficiencies. Making it mandatory would maximise participation rates from producers and retailers, maximise coverage of return locations, ensure fairness and consistency, and maximise return rates from consumers. A mandatory DRS would require legislation to be created, including the scope, deposit value, stakeholder responsibilities, targets, and penalties for non-compliance.
Ownership	Industry	The most effective systems are those run by the beverage industry (i.e. the obligated producers) with strong involvement of the retailers as return locations (return to retail). Industry ownership means that the beverage industry can use its expertise to improve cost-effectiveness. By allowing industry to operate a DRS, obligated producers can strive to minimise producer fees through engaging retailers network as return points for containers, while delivering on the requirements that are set on the System Operator by law. In Vietnam, the system ownership could be adapted with careful consideration of how retailers and the informal sectors are involved in the system governance to improve efficiencies.
System Operator	Single System Operator	A single System Operator has full visibility of all the flows of data, and this is essential in ensuring the DRS is well run and cost-effective. It would also reduce complexities associated with multiple System Operators. The System Operator will continually look for ways to improve the efficiency of the DRS. There are various methods of forming a System Operator (e.g., via government tender or [preferably] industry formed with government licensing).

DRS Element	Recommendation	Rationale and Further Information
Return rate target	90% for PET bottles and aluminium cans	Well-designed DRSs can achieve return rates of 90% or greater after several years of operation. Targets, set in legislation by government, are an essential component of a DRS.

Environmental Benefits

Modelling undertaken for the study estimated that implementing the proposed DRS would result in significant environmental benefits, as follows:

- **Increased recycling:** A DRS could be expected to result in an additional **21 to 77 thousand tonnes of used beverage containers being recycled per annum**, diverting waste from landfill, dumpsites, and open burning, and reducing littering.
- **Reduced greenhouse gas emissions:** By capturing high-quality materials for recycling, the DRS could reduce approximately **265 thousand tonnes of CO_2e emissions annually**.
- **Reduced plastic pollution**: High return rates would minimise plastic leakage into the environment, supporting Vietnam's commitments under its National Action Plan for Marine Plastic Litter and National Strategy for Integrated Management of Solid Waste to 2025, with a Vision to 2050.
- A reduction in **environmental externalities** (considering greenhouse gas emissions and localised air pollutants) of **1.4 trillion VND per annum**.
- A reduction in **litter disamenity** of approximately **10.1 trillion VND per annum**. This is based on a 'willingness to pay' methodology, which is explained further in Section 5.5 of this report.
- These benefits align with Vietnam's national sustainability goals, including achieving net-zero emissions by 2050 and reducing marine plastic litter by 75% by 2030.

Economic and Social Impact

The proposed DRS is also projected to create significant economic opportunities while addressing current inefficiencies in the waste management system:

- **Cost-effectiveness for producers:** Estimated Producer Fees (i.e., the cost paid by beverage producers to the System Operator per beverage container placed on the market) **are expected to be less than half the cost of fees in typical European DRSs**, making the DRS financially attractive as a means for beverage manufacturers to achieve the highest possible return and recycling rates for their containers. The total estimated cost to producers through Producer Fees in the proposed DRS is 720 billion VND per annum. While there are high costs associated with the setup and operations of a DRS, studies suggest that a DRS can represent long-term economic benefits compared with conventional waste management systems (e.g., kerbside collection) where the intention is to transition towards a more circular economy. Some DRSs in Europe, America, and Australia, and New Zealand have been found to be more cost-

effective than conventional waste management systems from between two to 10 years following implementation of a DRS.[4]

- A DRS could result in an increase in **formal employment**, throughout the beverage supply chain, of around **6.4 thousand additional jobs**.

- The proposed DRS is designed to not be detrimental to **waste reclaimer income**. The economic estimates around this are uncertain, due to large uncertainties regarding current collection rates by waste reclaimers, productivity (including estimates of productivity after introduction of a DRS), and incomes. However, based on central case estimates in the modelling, it may have a neutral or even positive impact on waste reclaimer income – depending also on how consumers, waste reclaimers, and junkshops interact with each other and with the proposed DRS. It would provide opportunity through waste reclaimer integration into a DRS, while also offering formal employment opportunities to waste reclaimers. While we provide some commentary on uncertainties in the next subsection, the central case assumptions used in the modelling indicate that an estimated **9.6 thousand waste reclaimer jobs** could be created with a DRS, these being:

    - **7.8 thousand jobs** could be created for waste reclaimers through 'separate collections' (which are similar to current 'door to door' collection methods in Vietnam) of used beverage containers, with incomes similar to current average earnings.

    - **1.8 thousand jobs** could be created for landfill and street waste reclaimers in sorting DRS containers from refuse.

- To summarise the overall employment impacts, formal jobs are estimated to increase by 6.4 thousand under a proposed DRS, while it could also create opportunities for an additional 9.6 thousand informal jobs.

Managing Uncertainties and Risks

The main uncertainty in the modelling was around the proportions of used beverage container returns returned to retail and depots, as opposed to junkshops via informal sector waste reclaimers. In practice, this is expected to be affected by the adopted deposit value and the convenience of retail and depot return locations. Careful attention to these aspects of the DRS design is advised prior to implementation.

Other sources of uncertainty in the modelling were due to data limitations concerning quantities of beverage containers placed on the market, current waste management activities, and informal sector activities and prices. In general, as there are no comparable examples of mandatory DRSs for single-use containers in markets similar to Vietnam's to draw upon, and various assumptions and forecasts needed to be made (such as the behaviour of consumers in response to DRS implementation – as mentioned above), there are inherent uncertainties in particular modelling assumptions. Nevertheless, the assumptions used are considered reasonable central case estimates. Whilst the current assignment modelled just one potential outcome of a DRS, future work could include sensitivity analysis on the assumptions used, to test how changes affect the economic and environmental impacts.

[4] Lakhan, C. (2024). Evaluating the Effectiveness, Costs, and Challenges of Deposit Return Systems for Beverage Containers: A Meta-Analysis. *World Journal of Advanced Engineering Technology and Sciences*, 13(01), pp112–131. Available at: link

Other key risks include exploitation of the DRS through fraud, and the possibility of low return rates from consumers and waste reclaimers – though this can be managed once clearer understanding of the response to the deposit value is known in the Vietnam situation.

Piloting the DRS would provide practical insights into implementing a DRS in Vietnam, helping to fill data gaps and firming up understanding of how a DRS should best be designed to succeed in Vietnam. The pilot should lead to improvements upon the design modelled in the study to help ensure that any risks are managed and mitigated.

In addition, further consultation with key stakeholders in the value chain (i.e., Government, producers, retailers, junkshops, waste reclaimers, and consumers) would be expected to assist in provision of information and in risk management.

Conclusions

The research, analysis and stakeholder engagements undertaken within this study have served to establish a viable outline design of a DRS for single-use beverage containers in Vietnam, which will increase collection and recycling rates of used beverage containers.

The study presents the case for a nationwide DRS by assessing financial considerations, job creation, and environmental impacts. The next steps towards a DRS in Vietnam would include further consultation with stakeholders, and further work in developing the impact case around economic, environmental, and social impacts – including investigation and sensitivity analysis around the current uncertainties. Such additional consultation and analysis could address uncertainty of data, further define and support the design choices, and assist in risk mitigation.

A possible pilot of the DRS would provide further insights into the practical realities of implementing a DRS in Vietnam and how best to design a DRS for success. This could allow the design explored in the study to be improved upon, further reducing the associated uncertainties and risks.

It is also necessary to consider a wider view on how EPR can best be designed and operationalised so that DRS and EPR work in symbiosis to tackle Vietnam's waste problems while providing opportunities for environmental protection and social improvement. DRS is a highly valuable tool to assist in the transition to a circular economy, though additional parallel waste management activities and initiatives are needed to provide the vital comprehensive reforms to the country's waste and materials management problems.