



Reusable standardised crates in Europe

Case study of Svenska Retursystem's reusable crates in Sweden



REUSABLE STANDARDISED CRATES IN EUROPE

CASE STUDY OF *SVENSKA RETURSYSTEM*'S REUSABLE CRATES IN SWEDEN

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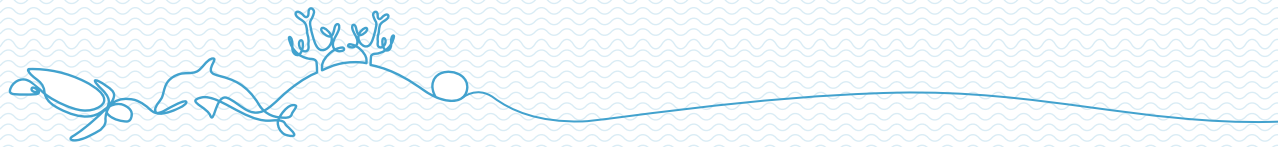


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1 INTRODUCTION



This publication provides background and operational aspects of the system for the use of reusable crates in transport and distribution of fruits and vegetables in Sweden.

The use of reusable crates is found in many European countries and is sometimes part of very old reuse systems. One example are crates for beer and wine, which were in the old days made of wood.

Today plastics are more commonly found. However, in Sweden, reusable crates are the primary packaging for more than 50% of the fruits and vegetables on the market (wholesale, food retail and restaurants). The deposit-return system will reduce demand for materials that perhaps are recycled or end up at a landfill. Reuse is high in the hierarchy of waste management. The resource efficiency links to the number of circulations that the crates will go through and to the management of the alternative material (► see for example [Coelho et al. 2020](#)). The scope here is on business to business (B2B) crates for distribution, which entails other opportunities than setting up a reuse system between a business and consumers (business to consumer, B2C).

In Europe there are several directives and strategies to guide and regulate the use of packaging and transport materials. The packaging directive (> [European Parliament 2018](#)), the strategy and work on circular economy (> [European Commission 2015](#); > [European Commission 2019](#)) and generally on actions to reduce waste and reduce greenhouse gas emissions provides the framework that promotes and regulates the introduction of reuse systems (or in some case forces these systems to be introduced as present packaging or distribution models are no longer economical or allowed).

This report describes the introduction of reusable crates as a deposit-return system, from two perspectives: i) the developer and operator of the system and ii) a company in the fruit and vegetable business applying the system of reusable crates in their supply chain. A deposit-return system means that the consumer of a product pays a deposit when receiving the product, and gets reimbursed after returning it. In the case of crates this means that the producer in need of crates for transporting their goods will pay the deposit to the system operator, and this deposit is then repaid once the crate is returned to the operator. The report presents the example of one system, the Svenska Retursystem (SRS) in Sweden.

This report focuses on the deposit-return system for reusable crates in Sweden:

Svenska Retursystem (SRS)





2 THE SYSTEM OF REUSABLE CRATES FOR FRUITS AND VEGETABLES



One system dominates the Swedish market for reusable crates for transport and distribution of fruits and vegetables and that is the system governed by Svenska Retursystem (SRS), which was launched in 1997 and has since then expanded on the Swedish market. The presentation here is divided into the system operator, SRS, and secondly a company as user of the system.

A life cycle analysis of the Crate Full-size 167 black showed that it reduced CO₂ emissions by 74 per cent.



Between 1997 and 2016 the system of reusable crates has replaced 1.3 billion pieces of disposable packaging. A life cycle analysis of the crate *Full-size 167 black* was conducted in 2016 and showed that the reusable crates reduced CO₂ emissions by 74 per cent, compared with equivalent disposal packaging made of corrugated cardboard (► [Alander et al., 2016](#)).

2.1 Svenska Retursystem – owner and operator of reusable crates system

Svenska Retursystem (SRS)¹ is the developer and operator of the reusable crate system. It delivers, brings back, checks quality and washes returned crates, in addition to ensuring that enough crates are in the system, administration issues and controlling the quality of the crates. SRS started the business in 1997 and the food retailers were the driving actor. They wanted to minimise their packaging waste and therefore only purchased fruits in the reusable crates². SRS is owned by The Trade Association for Grocery of Sweden (SvHD) (50%) and the Swedish Food & Drinks Retailers Association (DLF) (50%). Both SvHD and DLF contributed with money in the beginning. SRS also got money from the Swedish government. The system was non-profit for the first 5–10 years.

When introducing the system, the aim was to introduce a standardised packaging system with improved operations, working conditions and sustainability conditions, which in the long run would minimise the costs (less packaging disposal, less food waste). Over the years the system has streamlined the fruit and vegetable business thanks to the standardised sizes and the possibilities to pile the crates and using robots.

Standardised sizes, the possibilities to pile the crates and using robots

has streamlined the fruit and vegetable business.



- 1 In English the translation of the company name is *Swedish Return System*.
- 2 In 1994 the producer responsibility framework was implemented in Sweden (SFS 1994). Sweden joined the European Union in 1995 after a referendum in 1994.

Today the crates are used in more than 50% of the fruits and greens businesses in Sweden (exact number is not available due to competence). The rest of the packaging is corrugated cardboard, which is a cheaper alternative for producers. SRS is established on the Swedish market thanks to the different actors involved. The producers, wholesalers and retailers have been, and still are, a great influence on the market. Wholesalers provide stores and restaurants with fruits and vegetables in the crates, a choice the stores and restaurants rarely can change. Many wholesalers also encourage producers to use the crates. SRS has a great share of the market already, probably as big as it can get, and the system sells itself thanks to this.

In short, the business model consists of four steps:

1. Producer: SRS delivers reusable crates to the producer. The crates are filled and delivered to the wholesaler.
2. Wholesaler: the wholesaler delivers to the retailers.
3. Retail: the retailer empties the crates and returns them to the wholesaler.
4. Washing and control: SRS brings back the crates from retail for quality control and washing. Thereafter they are ready to be used again (see 1. Producer).

The crates will be recycled

The crates are grinded to pellets for making new crates



SRS provides six different sizes of crates as part of their systems. The crate types are three full-size and three half-size crates, details regarding size, loading and stacking capacity and weight are found in Table 1. SRS delivers the crates to the producers (only producers in Europe), for every delivered crate there is a deposit of 4.00 € per crate. The deposit circulates in the system (1–4 above). There are no restrictions relating to the period of time that the crates can be used. Additionally, there is a user fee for every crate the producer buys. The user fee is 0.20 – 0.50 € per crate, depending on the size and number of crates (including quantity discount). The user fee is only for the producers, it does not circulate. The manufacturing price for a crate is 6.00 – 8.00 €, depending on size. The crates have an average lifetime of about 10 years and are used on average 10 cycles (returned to SRS) per year. This means that each crate is used about 100 times before end-of-life. At their end-of-life stage, the crates are grinded to pellets and recycled by producing new crates. SRS has a total of about 20 million crates in their system and the average number of deposit cycles of one crate is 150 times. There are six different types of crates used (► Table 1).

Table 1

Type, size and characteristics of the SRS crates.

Type of crate	Working height (under bale arms, mm)	Loading capacity (lower/higher capacity, kg)	Stacking capacity (kg)	Weight of crate (kg)	Minimum inner bottom size (mm)
Full-size 167 black	167	20	375	1.6	546 x 349
Full-size 110/140 green	110/140	9/12	181	1.5	5454 x 349
Full-size 50/80 red	50/80	5/7	177	1.2	552 x 352
Half-size 165 black	165	11	200	0.9	362 x 259
Half-size 120 red	120	8	200	0.8	362 x 258
Half-size 50/80 blue	50/80	5.5/2.5	200	0.7	358 x 253

The crates provided by SRS are primarily used on the Swedish market, but producers abroad (in Europe) can use the crates for fruits and greens that are subsequently sold in Sweden. The crates should eventually return to Sweden, not circulate on the European market. SRS has no plan to introduce their system outside of Sweden, the owners are Swedish and there are presently no incentives to establish their system abroad.

During harvest season the need for crates will increase. SRS must meet the needs for the number of crates during these times. This can be a challenge if crates are “stuck” in stores, restaurants or at wholesales or producers. The present business model does not have any limit in terms of time the crate can be with the producer and wholesale. When the harvest season is over, SRS may have many crates in store. Non-circulating crates do not generate revenue and SRS has not come up with a solution what to do with the crates when the need is not peaking.

According to SRS, deposit is the key-incentive for the re-circulation of the crates. They see a possibility to circulate the crates quicker when combining the deposit with a day rent. This would provide an incentive to avoid having crates getting “stuck” in the system. But a rent also creates administrative burdens, which may reduce the attractiveness of the system – this is an important balance. All actors in the supply chain should be considered in order to make the crates circulate from SRS to producers/wholesale and back to SRS efficiently. Information regarding the system and its advantages is important to spread to all stakeholders. SRS highlights the value of cooperation within the industry. Different actors compete with each other, but not when it comes to packaging. A joint agreement with the crate system is important to make it work. SRS thinks the producers can be a key partner to introduce the deposit-return systems: they are first in the supply chain and can influence the rest of the chain with their choice of crate.

SRS also provides pallets that also have a one-time cost and deposit. In the case of the pallets, SRS also charges a daily rent.

2.2 Fruit and vegetable businesses – users of the crates

The example company (from now on “the company”), which provided information for this study but wants to remain anonymous, is a group of fruit and vegetable businesses in Sweden and Denmark. They are involved in growing, buying, refining, packaging, marketing, selling and transporting fruits and vegetables to shops, restaurants, etc. In the early 2000’s they introduced SRS crates to transport the products they handle. Today, the crates account for 30–40%, depending on the season, of their total use of crates. The rest is corrugated cardboard. For the products that they grow as part of their business operations the proportion of SRS crates used are 80–90%.

80–90% is the proportion of SRS crates

for the products that the company grows as part of their business operations



Figure 1). Even though the crates are effective, not all fruit will be packed in them. E.g. bananas produced outside of Europe will be packed in corrugated cardboard as the crates cannot be sent all over the world. Some producers of fruits and vegetables asked for the opportunity to promote their brands on the reusable packaging, which is not possible with the standardised crates. Marketing on packaging is a lost opportunity when using the SRS system, according to the company.

The company pays the deposit for the crates from SRS and sends them to producers abroad or uses them in the own production. The crates are filled with fruits and vegetables before delivery to wholesalers, retailers or restaurants. When the crates leave the company, the deposit (4.00€) leaves with the crate and is paid by the receiver (> Figure 1).

Companies operating in the food retail sector often demand that their fruits and vegetables should be delivered in the SRS crates. But there are no legal requirements to use the crates. The demand for the crates has also recently increased from public sector side, e.g. schools (which serve lunch every day in Sweden) asked for the crates and in 2020, the company was part of introducing the crates for restaurant wholesalers and to the public sector (schools for example). The

introduction was mostly positive, but also resulted in a loss of customers who for various reasons could not fit the crates in their business. A common reason why restaurants are more negative about the crates is that they are bulky (despite the possibility to stack the empty crates), as lack of space is a common problem in restaurants. If the restaurants for some reason do not return the crates to the wholesaler, they are the ones who have to pay the deposit fee (capital is tied up in the circulating system).

The design of the crates enables an easier handling for the company that uses robots in its operations. The standardised size, durability and possibility to pile and pack them on pallets was important when introducing the crates in their business twelve years ago, back then the robots were not as smart as today. The robots streamline the business, which is an economic advantage for the company. Pallets with corrugated cardboard are not as stable as a pallet with the SRS crates. The number of work-related accidents and lost fruits and greens was higher before introducing the SRS crates.

Not only is the working environment better, but it is also less food waste and economic loss.

Fruits and greens last longer in the crates, compared to corrugated cardboard packaging, which does not have openings for air and moisture. Another advantage with the reusable crates is the resistance against rain and humidity, the crates will not change structure or strength when wet. Corrugated cardboard packaging is not compatible with the automatic robot system the company uses. The price for corrugated cardboard packaging has grown in the last years, which increases the incentive to use reusable crates.

Regarding the daily rent on crates the company says it could be a roadblock for some stakeholders, especially smaller businesses with a high flow of crates. SRS also provides pallets, which not only come with a deposit but also include a rent. The rent on the pallets does not automatically follow the circulating pallet and will have to be handled manually. One aspect is who should pay if a crate is stuck due to a problem in the transportation between actors, who is responsible for the raised rental fees and who would pay in the end? The company therefore believes that the introduction of a rent on the boxes would require a lot of administrative work. This can of course be arranged with today's technology, and should be done from the start, if a rent becomes relevant.

When introducing the reusable crates, it is of great importance to explain why the change is being made to all stakeholders, and what the advantages are, both environmentally and economically. The company highlights the importance of getting all aboard to make the implementation possible.



3 SIMPLIFIED FLOW SCHEME OF THE SYSTEM



► **Figure 1** (page 13) provides a simplified scheme of the system for transporting and organising the reusable crates. It also contains information of the payments and flow of the crates, as well as the different roles.

A producer orders a number of crates from SRS. They will pay a one-time cost based on the sizes and numbers of crates and also provide deposit for each crate to SRS. The one-time cost per crate is cheaper when ordering more and ranges from 0.20–0.50 € per crate. The producer will also pay the deposit to SRS as they receive the crates. The deposit is 4.00€ per crate. The deposit is only paid once and will then follow the crate as it is used and transported in the system.

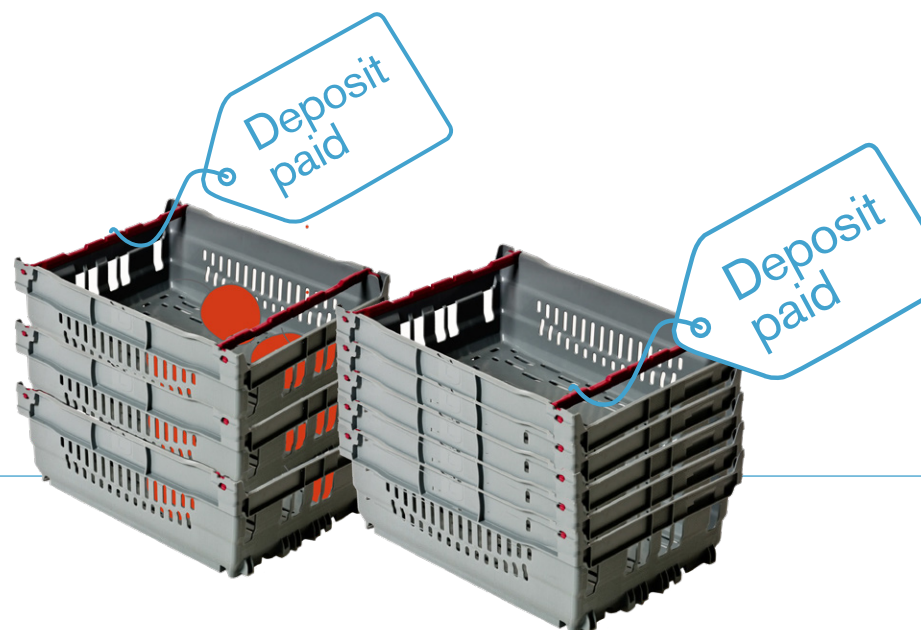
The producer fills the crate with their goods, and it is then sold to wholesale or directly to a food retailer or restaurant. The buyer of the products will compensate the producer with the crate deposit. The wholesaler then distributes the crates with fruits or vegetables to different food retailers and restaurants, and the deposit follows. Typically, the crates are handled on a balance approach meaning that if there is a deficit of returned crates, this will be compensated to the wholesaler.

The retailer and restaurant unpack the crates and store the crates until the wholesaler picks them up (for example at the next delivery or when the retailer or restaurant has stored a specific minimum amount). The wholesaler contacts SRS when they want the empty crates to be collected. SRS picks up the crates and the

deposit is refunded. SRS then quality controls, washes and if needed repairs or removes crates from the circulation. The crates are stored for the next cycle. Some crates are taken out from the circulation and these are sent to the manufacturer to be grinded into pellets and then made into new crates. The average lifetime of one crate is 10 years and reportedly the average number of cycles is about 100 during the lifetime. New crates from the supplier cost 6.00–8.00 € per crate depending on the size and type.

Some crates may not circulate back to SRS due to loss or alternative uses by someone in the system or elsewhere. This will cause the loss of the deposit. Since the deposit is less than the cost of one crate, SRS has a vested interest to have as few lost crates as possible.

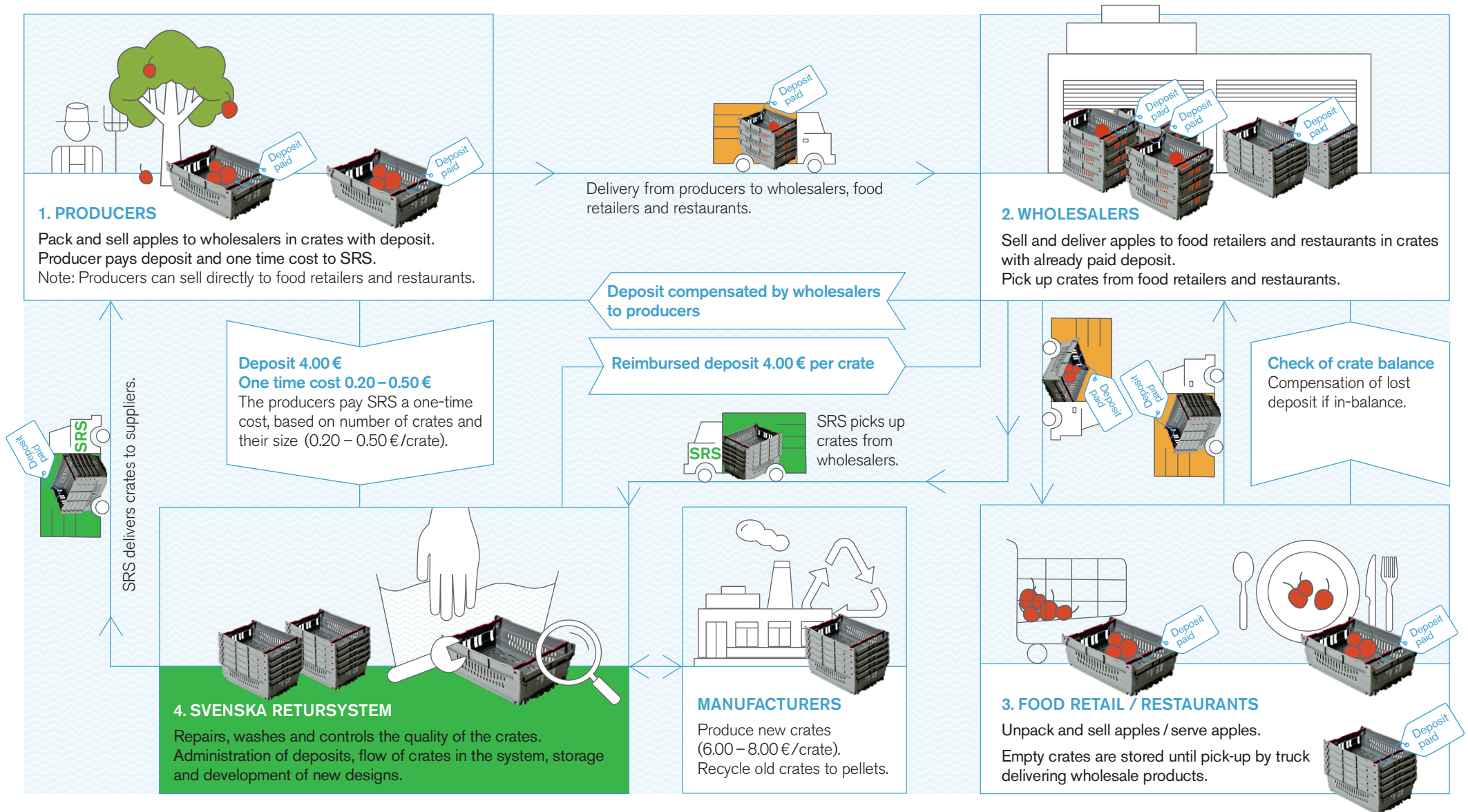
The user fee is the only cost that does not circulate. It is paid to SRS by the first customer, which is often the one who orders and receives the crates from SRS. The wholesaler is the return customer, which is the organisation where the empty crates are collected and to which the deposit will be refunded.



› Figure 1

Figure 1

Simplified scheme of the reusable crate system operated by Svenska Retursystem, Sweden. It illustrates the stages where there is a deposit associated with the crate (tag with deposit) and not (crates without deposit tag).





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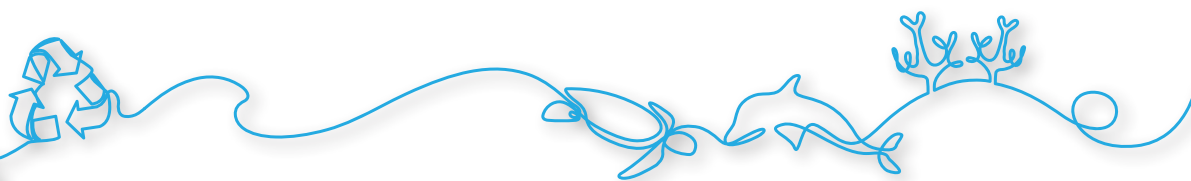
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