

Environment, Climate Change and Low Carbon Economy Program

'Environmental Program'

Financial Mechanism of the European Economic Area 2014 – 2021

Final report

30/12/2022

## 02\_CALL#1 - Deposit system for non-reusable beverage packaging in the Azores

*In accordance to Article 25, number 2, paragraph j) and article 29, number 4 of the 'Guide for Applicants to Environmental Projects Financing, on Climate Change and Low Carbon Economy'*

[https://www.eeagrants.gov.pt/media/2993/guia-para-o-financiamento-projetos-eea-grants\\_programa-ambiente\\_28112019.pdf](https://www.eeagrants.gov.pt/media/2993/guia-para-o-financiamento-projetos-eea-grants_programa-ambiente_28112019.pdf)



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## i. Detailed Description

As part of the project 02\_CALL#1 – Deposit system for non-reusable beverage packaging in the Azores, a contract was signed on July, 21<sup>st</sup>, 2020, between the General Secretariat for the Environment and the Regional Directorate for the Environment, currently the Regional Directorate for the Environment and Climate Change (DRAAC), which aimed to regulate the technical, operational and financial terms and conditions between both parties, with 18 months duration, ending on December 31<sup>st</sup>, 2021.

Given the contingencies verified within the scope of the Covid-19 pandemic, in the years 2020 and 2021, which led to delays in the production operationalization and a consequent inability to deliver the equipment within the expected deadlines (essentially caused by restrictions on travel outside the national territory, resulting from the serious epidemiological situation and the respective legislative measures to combat it, completely limiting the movement of people and goods), it was necessary to proceed with the 1<sup>st</sup> Addendum to the Project Contract, that shifted the execution deadline to June 30<sup>th</sup>, 2022 and lead to rescheduling activities and funding deadlines.

For the same reasons listed above, it was also necessary to make a 2<sup>nd</sup> addendum to the contract that changed the project execution deadline to December 31<sup>st</sup>, 2022.

Although the project has a defined execution period, the deposit system for non-reusable beverage packaging will operate beyond this period, with the legal framework expressed in article 15 of Regional Legislative Decree 5/2022/A, of March 4<sup>th</sup>, which establishes measures to reduce the consumption of single-use products and promote reuse and recycling.

Through Ordinance 31/2022, of May 17<sup>th</sup>, the terms and criteria applicable to the pilot system for depositing non-reusable plastic, glass and metal beverage packaging were defined, including a mechanism to encourage consumers to return of the packaging, in order to ensure its recycling.

Under the terms defined in the ordinance, the Azores packaging deposit system came into operation on May 18<sup>th</sup>, 2022 in all islands and municipalities. Figure 1 shows a photograph of the machine installed in Ribeira Grande's municipality.



*Figure 1 - Ribeira Grande machine.*

Ordinance 88/2022, of September 6<sup>th</sup>, amended the article 6 of Ordinance 31/2022, of May 17<sup>th</sup>, in order to establish a monthly limit of 500 packages per card with the right to a 0.05€ premium per package. Packages above this limit can be placed in the machines, without the right to a premium. There was a need to establish this limit as a very small percentage of citizens and the HORECA sector were proceeding to the deposit of large amounts of packaging, creating constraints on the access to the machines by most of the other users. Figure 2 shows an episode of the use of the system by individuals of that sector.



*Figure 2 - Photograph illustrating the use of the system by the HORECA sector.*

The pilot project, implemented in the Autonomous Region of the Azores (RAA), allowed the installation of 25 reverse logistics machines (RVM) that serve all the inhabitants scattered across the 9 islands of the archipelago, guaranteeing at least one equipment per municipality. Table 1 shows the current locations of equipment.

Table 1 - Location of machines

Island	Municipality	Location	Acronym
Corvo	Vila do Corvo	Multipurpose Service Building at City Hall	COR
Flores	Lajes das Flores	Multisport Building of Lajes das Flores, Avenida do Emigrante nº 16, Lajes das Flores	FLO - Lajes
	Santa Cruz das Flores	Santa Cruz City Hall Parking Lot	FLO - Santa Cruz
Faial	Horta	Horta Municipal Market	FAI - Mercado
		Next to the building of Casa do Povo dos Cedros	FAI - Cedros
Pico	Madalena	Madalena Municipal Market	PIC - Madalena
	São Roque do Pico	Municipal Garden of São Roque do Pico	PIC - São Roque
	Lajes do Pico	Headquarters of the Humanitarian Association of Volunteer Firefighters	PIC - Lajes
São Jorge	Velas	Praça Velha	SJR - Velas
	Calheta	Calheta Municipal Auditorium Building	SJR - Calheta
Graciosa	Santa Cruz da Graciosa	Santa Cruz Municipal Market	GRA
Terceira	Angra do Heroísmo	São Sebastião parish council	TER - São Sebastião
		Duque de Bragança Municipal Market	TER - Mercado AH
	Praia da Vitória	Next to the public Park -Paul da Praia da Vitória (Skate Park)	TER - Praia da Vitória
		Next to Biscoitos Basic and Integrated School	TER - Biscoitos
São Miguel	Ponta Delgada	Parking lot- Madruga Av. Antero de Quental, São José	SMG - PDL
		Mosteiros	SMG - Mosteiros
		Poços de São Vicente Ferreira	SMG - Poços
	Lagoa	Bus stop covered building (Rosario)	SMG - Lagoa
	Ribeira Grande	Municipal warehouse- Rua do Estrela	SMG - Armazém RG
		Rabo de Peixe Community Center	SMG - Rabo de Peixe
	Nordeste	Bus stop building (Largo da Choca)	SMG - Nordeste
	Povoação	Parking lot (Estrada Regional Nascente)	SMG - Povoação
Vila Franca do Campo	Vila Franca do Campo municipal market	SMG - VFC	
Santa Maria	Vila do Porto	Vila do Porto municipal market	SMA

This equipment receives plastic (PET), metal (aluminium) and glass beverage packaging with a maximum capacity of 2.5 liters, with a premium of €0.05 per packaging being awarded to the user. Beverage packaging collected within the scope of the deposit system fits the definition of urban and/or similar waste and is sent for recovery through the respective urban waste management systems. In order for the users to deposit packages, they need to go to an Integrated Citizen Support Network (RIAC) store and request their card, which is free and can only be assigned to holders of a citizen card, over 18 years old. The prize is awarded to the user by bank transfer, by transfer request through the RIAC portal or by cash refund at RIAC stores.

The system application was developed and made available to users, available at <https://embalagenscomvalor.ambiente.azores.gov.pt/>, where they can consult the number of deposited packages, the card balance and the history of deliveries and movements (Guide for users: [PowerPoint Presentation \(azores.gov.pt\)](#)). It is even possible to search the location of the machines. Images of the application are shown in figure 3.

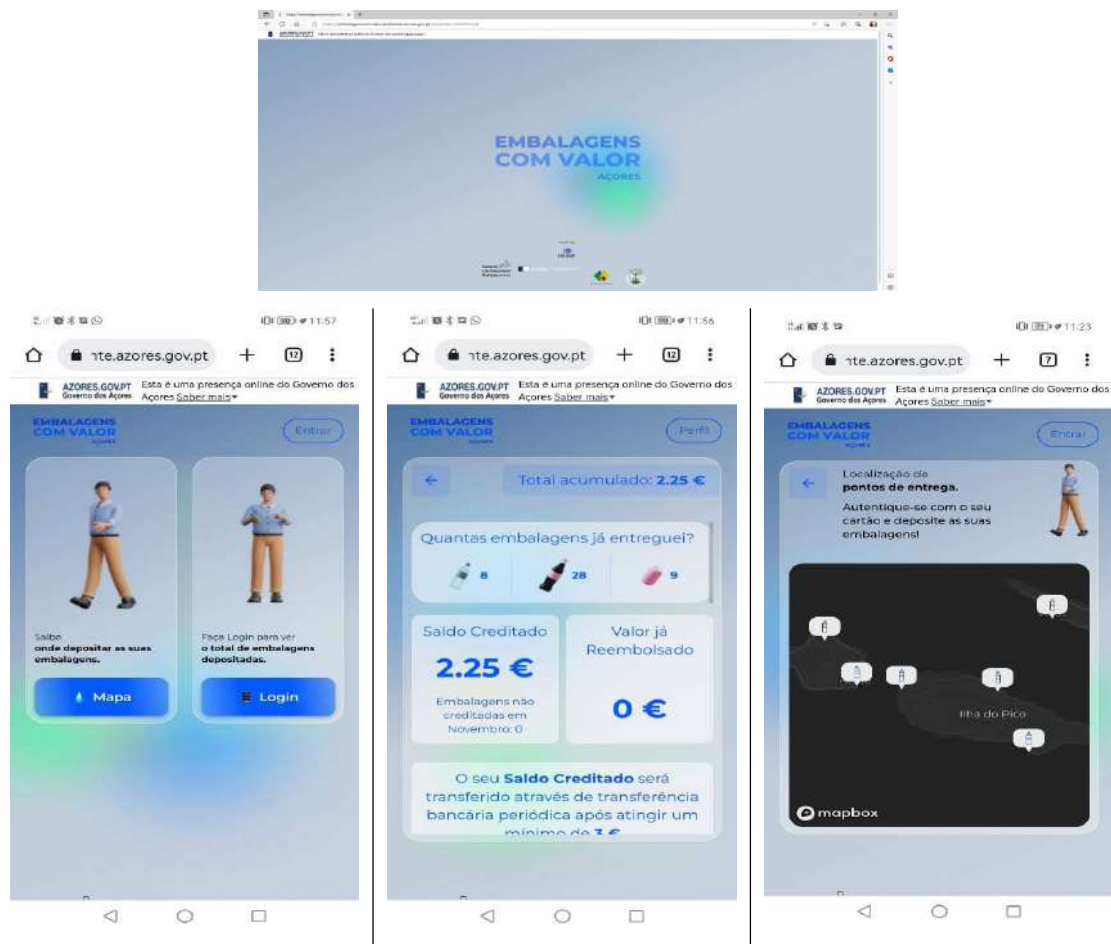


Figure 3 -Application of the Beverage Packaging Deposit System in the Azores

As part of the project, awareness raising activities were carried out, with dissemination of information materials, as planned. Figure 4 shows a photograph of one of the information sessions held, in this case on the island of Corvo.



*Figure 4 - Information session held on Corvo island*

A very close monitoring of the population was made, with the provision of a cell phone number, allowing a direct and constant contact with the technical team that follows the project, for questions, clarifications and complaints. This cell phone number is also used to send photographs with the bar codes of beverage containers that are not being accepted by the machine, allowing, with the collaboration of users, to update the database. Between the beginning of the project and July 31, 2022, approximately 2000 codes have been introduced in the system. When a barcode is not recognized, the message shown in figure 5 is displayed.



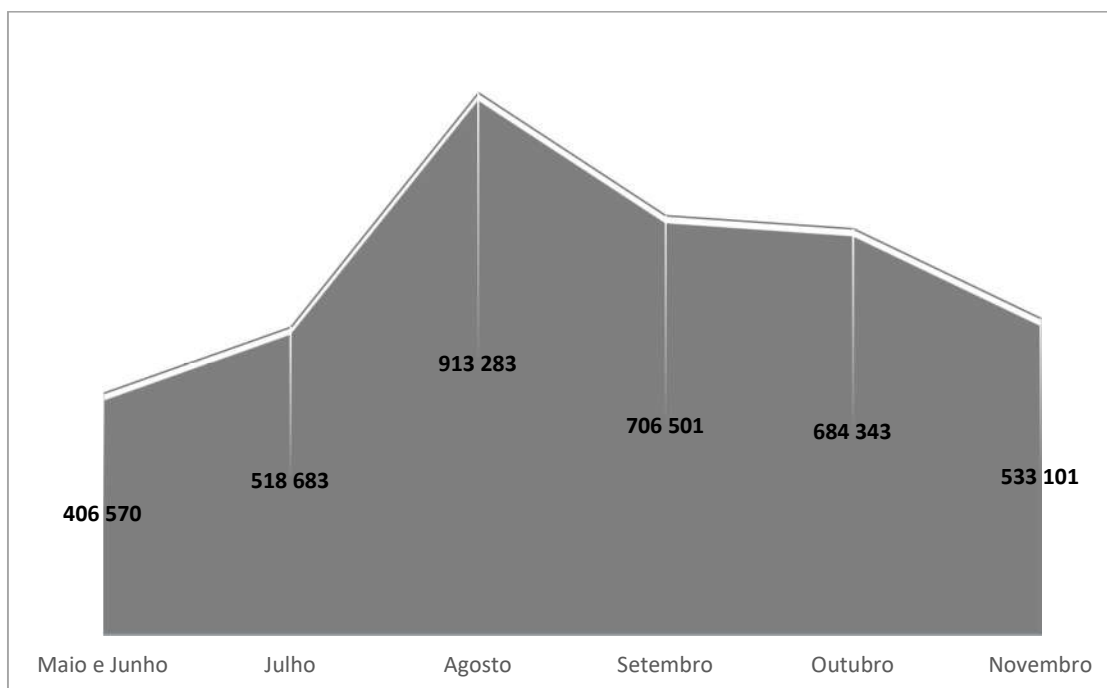
*Figure 5 - Message displayed when the barcode is not recognized and instructions on how to proceed*

ii. Achieved Results

**Statistical data**

Since the beginning of the pilot project until December 2022, 3,762,481 packages were deposited in the machines, being 47% made of glass, 33% of PET and 20% of aluminum. 10,998 cards were issued and 188.124,05 euros in premiums were awarded.

The number of packages deposited per month varied over the six months of the project, with a sharp increase from May to August and a decrease from September on, due to the entry into force of the Ordinance that established a maximum of 500 packages per card. Figure 6 shows the evolution of the number of deposited packages.

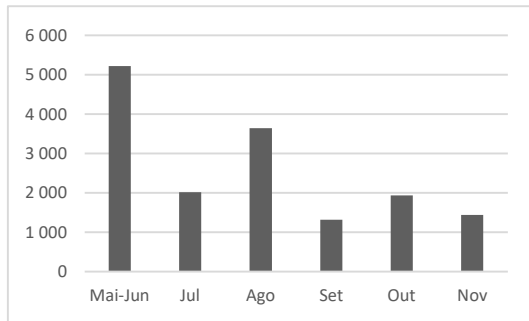


*Figure 6 - Number of deposited packages per month.*

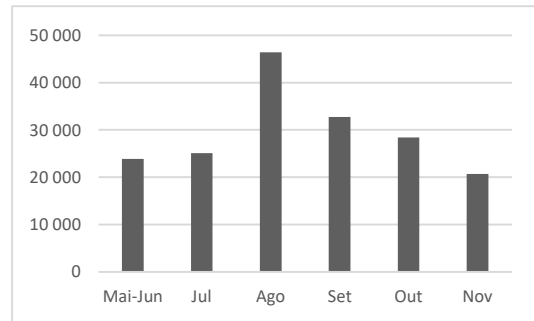
As shown in the previous figure, August was the month in which more packages were deposited in the machines, however, when evaluating the variations per island it is possible to observe that this trend does not occur in all islands, especially in Corvo and Terceira, as shown in the following figure.



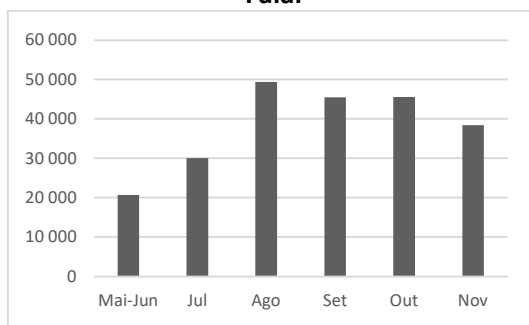
**Corvo**



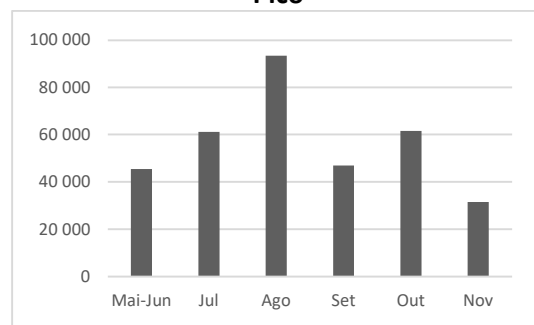
**Flores**



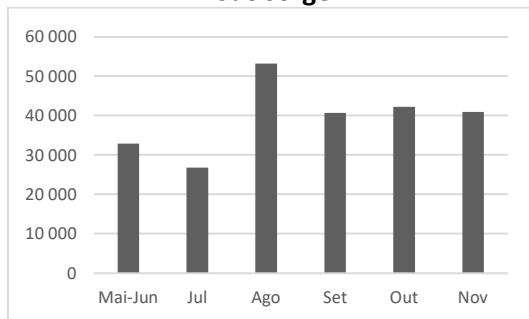
**Faial**



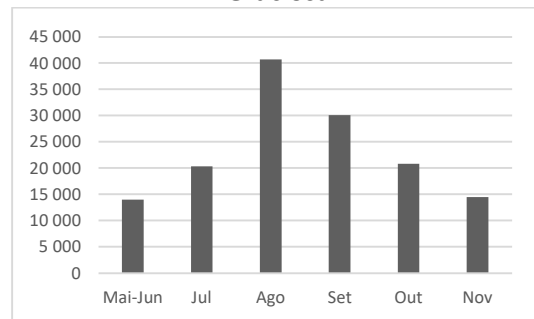
**Pico**



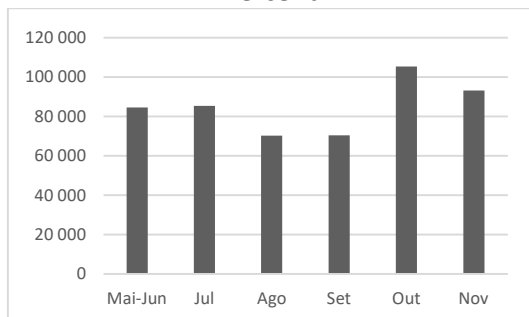
**São Jorge**



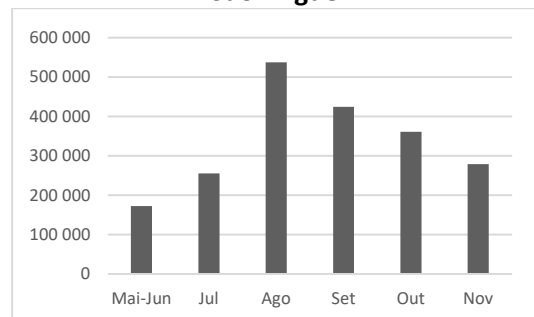
**Graciosa**



**Terceira**



**São Miguel**



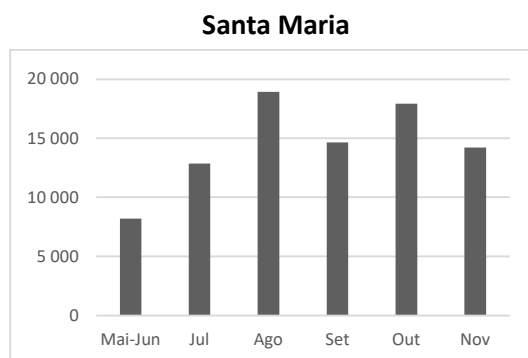


Figure 7 - Evolution of the number of deposited packages per month and per island.

On average, 16 packages per capita were deposited, being the island of Flores the one with the highest capititation (51.68 units/inhabitant) and Terceira the one with the lowest values (9.55 units/inhabitant). Figure 8 shows the capititation per island and for the whole region, for the period in between May and November 2022.

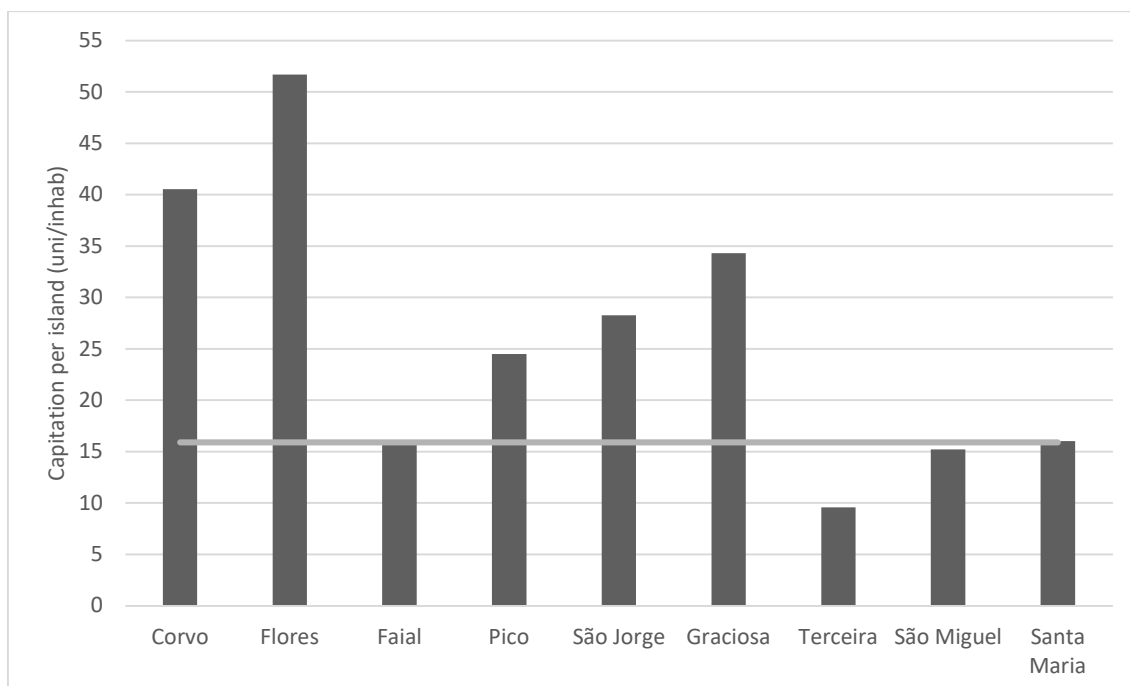


Figure 8 - Island and regional capititation.

The number of deposited packages per machine presents a high variation, being the main factors contributing to the highest registered amounts of deposited packages the fact that the

equipment is located in an urban center and the number of served population. Figure 9 shows the variation in the number of deposited packages per machine.

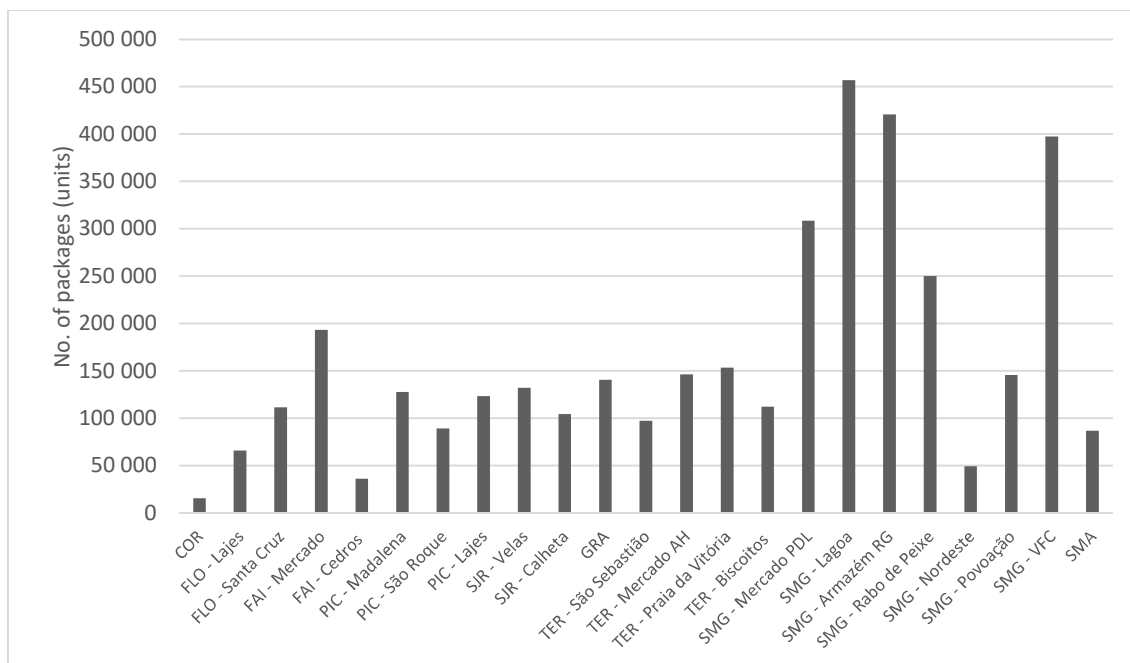


Figure 9 - Number of deposited packages per machine.

Note: 2 machines in Ponta Delgada went into operation in December.

As mentioned above, the machines that record higher deliveries are the ones in Lagoa, Ribeira Grande, Vila Franca do Campo, Ponta Delgada, Rabo de Peixe and Horta.

From the carried-out analysis and based on SRIR 2021 validated values, for a similar period, it is estimated that the beverage packaging deposited in RVM machines, represents about 15% to 20% of the total selectively collected beverage packaging delivered to licensed operators.

### **System operationalization**

The project had a great adherence of users and success among the population, being possible to verify that, effectively, with an incentive, the citizens adhere in an easy and enthusiastic way. Some deviation of packages from ecopoints for delivery in the machines was verified. However, effectively there are a number of people who did not separate and began to do so, motivated by the premium given per package.

Under the pilot project, the value assigned was provided by the Regional Government of the Azores, so it is not a true deposit system. However, it allowed us to assess the adhesion, functionality, strengths, weaknesses and opportunities in order to increase the quality and quantities of beverage packaging waste sent for recycling. It is essential in the future to fulfill the intentions of the polluter pays principle by creating a financially and environmentally sustainable system.

Initially there were doubts as to whether the value of 0.05€ would be attractive to citizens, bearing in mind that projects from other countries pointed to values of at least 0.10€ per package. Nevertheless, it was found that the value established was adequate and sufficient to motivate Azorean citizens.

The Regional Legislative Decree 5/2022/A of March 4, defined in number 3 of Article 15 that the equipment should preferably be installed in public buildings or buildings belonging to non-profit entities. Bearing this in mind, the decision to allocate the machines, with the municipalities support, was crucial in order to obtain the results here presented. It was concluded that the equipment placed closer to the main urban centers, with better access and longer opening hours, had the highest acceptance.

During the execution of the project it was necessary to change the location of some machines due to the fact that they were close to services and the noise they made was disturbing, because of disagreements near the equipment or because of vandalism. It is worth to notice that two machines were vandalized (broken screen), which required the equipment to be stopped for repair.

Since the equipment was in public places, it was necessary to apply a padlock to reinforce the existing lock, to prevent people from opening the equipment to remove the glass containers and reinsert them, thus perverting the system.

The biggest challenge and constraint to the pilot project carried out in the last months was the emptying of the machines. Since the adherence was high, there was the need to empty several times a day the storage containers. In logistical terms it was and it still is very demanding for the municipalities, since it requires regular and separate collections and its transport to the waste processing centers.

This situation was the source of the main complaints and required a lot of work and dedication of the partners, in order to create conditions for emptying and cleaning the equipment. Some machines were emptied 9 times a day, and the average was emptied around 2 times a day. Figure 10 shows the displayed message on the machine screen when a container is full.



*Figure 10 – Displayed message on the machine screen when a container is full.*

Throughout the project, there was a large number of people near the machines with large amounts of packages for delivery. Given this situation and as mentioned above, it was crucial to establish a monthly limit of value to be assigned per card, in order to give more stability to the project and allow the use of equipment by a larger number of users.

This measure reduced the number of deposited packages, but gave the opportunity to a larger number of citizens to get to know and use the system. It is considered that this was a determining measure for the credibility of the future deposit system to be implemented.



Figure 11 - Queue to access the machine at the Graça Market in Ponta Delgada.

RIAC played a key role in the implementation of the project, as it constitutes the most accessible mean of communication to citizens. RIAC stores and their operators were also decisive in informing and raising awareness among citizens about the use of the equipment.



Figure 12 - Project card given to each user in RIAC stores upon request.

### **Shipping to the recycling industry**

Packaging waste collected under the deposit system for non-reusable beverage packaging, namely glass, plastic and aluminum, is currently routed in the integrated packaging waste systems (SIGRE) of the three existing management entities, being:

- - Sociedade Ponto Verde - Ministerial Order No. 14202-E/2016, November 25, with regional extension by Order No. 387/2022, March 14;
- - Novo verde - Ministerial Order no. 1402-D/2016, of November 25, with regional extension by Order no. 1312/2022, of June 29;
- - Electrão - Ministerial Order No. 6907/2017, July 26, with regional extension by Order No. 1359/2020, August 14.

The table below presents the packaging waste from the deposit system sent outside the RAA, for the recycling industry on the mainland, since the beginning of the project.

*Table 2 - Packaging waste from the deposit system sent outside the RAA*

<b>Island</b>	<b>Quantity (tons)</b>
Flores	10,12
Faial	18,96
Pico	32,67
Graciosa	8,84
São Jorge	9,42
Terceira	45,14
São Miguel	167,87
Santa Maria	0,68
<b>Total</b>	<b>293,70 t</b>

*Source: e-GARs and SGRU validation*

Packaging waste is sent out of the installations in 20- and 40-foot maritime containers from waste management entities, partners in the pilot project, namely MUSAMI (island of São Miguel), Resiaçores (islands of Terceira, Santa Maria, Faial, Pico and Flores/Corvo), Equiambi (island of São Jorge and Graciosa), to recyclers comprised under the SIGRE, in marked and labeled packaging, with the indication of packaging coming from the pilot beverage packaging deposit system.

The separation from the origin allows for better quality of the received materials, since the presence of contamination is lower in the machines and there is no mixture in the municipal collection system. It is worthwhile to notice that in the installation, municipal and RVM/system packaging is separated. However, greater efforts are needed to raise awareness and improve

waste management of municipalities, not only in the frequency of collection, but in the perception of the good quality of the waste delivered to the high-level systems (SGRU).

*Table 3 - Sent packaging waste per material*

RSI code (packaging material))	Common Name	Quantity (tons)
19 12 05	Glass	266,81
19 12 04	PET plastics	22,52
19 12 03	Metal cans	4,37
<b>Total</b>		<b>293,70</b>

Comparing the packaging getting in and going out the facilities of the SGRU, it can be concluded that 85.14 tons are stored in the facilities, awaiting conditions for shipment out of the RAA, as shown in table 4.

*Table 4 - Quantity of packages that got in and got out the SGRU facilities.*

	Packaging getting in the installation (tons)	Packaging going out from the installation (tons)	Difference (accumulated in installation) (tons)
<b>Corvo</b>	1,95	0	1,95
<b>Flores</b>	19,36	10,12	9,24
<b>Faial</b>	20,23	18,96	1,27
<b>Pico</b>	32,52	32,67	-0,15
<b>São Jorge</b>	22,86	9,42	13,44
<b>Graciosa</b>	13,55	8,84	4,71
<b>Terceira</b>	54,85	45,14	9,72
<b>São Miguel</b>	205,59	167,87	37,72
<b>Santa Maria</b>	7,91	0,68	7,23
<b>Total</b>	<b>378,83</b>	<b>293,70</b>	<b>85,14</b>

The feedback from the managing entities was positive, showing no non-conformities in the received bales. Only SPV made the following observation coming from a reclaimer "Bales that are very compacted, causing difficulties in opening and clogging in the production line, due to the fact that the bottles are not separated from each other. Thus, it would be important to verify if it is possible in the baling of this packaging waste (from the machines), to reduce the baling pressure." This information was referred to the operators/SGRU of the RAA.



## Considerations

In summary, the goal of this project focused on promoting the environmental quality of ecosystems and reducing the adverse effects of pollution and other human activities, so that currently one of the major concerns of the Azores Government, through the Regional Secretariat of Environment and Climate Change, focuses on contributing to the adoption of a circular economy model.

To achieve this paradigm shift, it is necessary to stimulate a collective awareness about the impacts of individual actions and consumption habits.

The deposit system for non-reusable beverage packaging was implemented, given the concern in maintaining the focus on quantitative and qualitative waste prevention, combined with a reduction in the environmental impact of products throughout their life cycle. So, there was an increase in the amount of packaging waste sent for material recovery, as well as the quality of the material that reaches the recycling industries, allowing to save the extraction of natural resources and produce safer recycled products.

This pilot project has undoubtedly allowed us to see that this is the way forward for the RAA and the country to achieve the ambitious European targets.

It is confirmed that it is essential to introduce, in the Azores, new solutions for the delivery and selective collection of urban waste, making mechanisms available to the Azorean population to create alternatives that encourage changes in behavior and responsibility.

This model, which allows for the creation of new opportunities, jobs, and the promotion of innovations that bring competitive advantages, will also be an incentive that is intended to reach all Azorean consumers, providing economic and social benefits through monetary savings and increased quality of life, by promoting the principles of the circular economy, both in terms of production and consumption.

The attachments of this report comprise the updated schedule of activities, the project indicators, the description of costs, the assessment of the financial impact, as well as other elements that are considered demonstrative of the activities undertaken.

To conclude, the strengths and weaknesses of the pilot project in question are presented:

### **Strengths**

- Great adherence of the population;
- Increase in the quantity and quality of waste sent for recycling;
- Reduction of abandoned beverage packaging waste;
- Great commitment and involvement of all partners;
- Good response in terms of equipment operation and maintenance, even under heavy use;
- Adequate functioning regarding the financial flow with the allocation through RIAC stores;
- Positive response from recyclers regarding the quality of the materials forwarded;
- Improvement of the database, bar codes, for the 3 materials;
- The application that allows direct management of deposits by citizens and consequent dematerialization of the delivery control slip.

### **Weak points**

- Few equipment and with little storage capacity;
- Logistical difficulties in emptying the equipment;
- Theft in the ecopoints and door-to-door containers for delivery into the machines;
- Abusive use of the system by citizens in conditions of social hardship;
- Although reduced, there were episodes of vandalism on the equipment;
- Use of the equipment by the HORECA sector;
- Failures in the synchronization/connection of the machines to the platforms with delays towards credits.

iii. **Costs description and assessment of financial impact**

Attached to this report, information regarding all expenditures made to date and the respective financial execution rate by activity are presented (Attachment III).

iv. **Description of the Project's contribution to achieving the overall objectives of the EEA Grants and the 'Environmental Program**

Project 02\_CALL#1 was designed to meet the overall objectives of the EEA Grants and the 'Environmental Programme', objectives that focus on promoting the environmental quality of ecosystems and the reduction of the adverse effects of pollution and other human activities, focusing on contributing to the adoption of a circular economy model.

It is necessary to contribute to the adoption of a new trend in resource and business management, promoting the transition from a linear economy to a circular economy.

It is preponderant to present new solutions for the delivery and selective collection of urban waste, making available to the Azorean population mechanisms that allow to create alternatives to encourage changes in behavior and responsibility.

Thus, this model aims at creating new opportunities, jobs and promote innovation.

Regarding the indicators for which Project 02\_CALL#1 contributes to the fulfillment of the indicators of the 'Environmental Program', and which are included in the contract signed between the General Secretary for the Environment and DRAAC, we inform the following:

Program Area (PA)   Objective	Result expected	Indicator	Contribution from Project 02_CALL#1
PA11 Objective 1	Increase application of Circular Economy principles in specific sectors	Construction and Demolition Waste avoided in the supported sectors	NA
		Number of jobs created (disaggregated by gender and age)	1 job created (female, forties)
		Tons of recycled plastic resulting from 'Environmental Program' support	NA
		Increased use of secondary raw materials resulting from 'Environmental Program' support	NA
Output 1.1	Pilot deposit refund system for beverage bottles and cans	Number of Beverage Industry Entities participating in the Pilot System	3
		Number of companies in the retail sector participating in the Pilot System	0

NA- Not applicable

#### v. Attachments

Attachment I - Updated Activities Schedule

Attachment II - Project Indicators

Attachment III - Description of Costs and evaluation of financial impact

**The Project Promoter - Regional Directorate of Environment and Climate Change**

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<b>Name</b>	Alexandra Carvalho
<b>Date and signature</b>	
<b>Position</b>	General Secretary