



Circular packaging ecodesign assessment tool

USER MANUAL

CIRC-PACK project- Towards circular economy in the plastic packaging value chain

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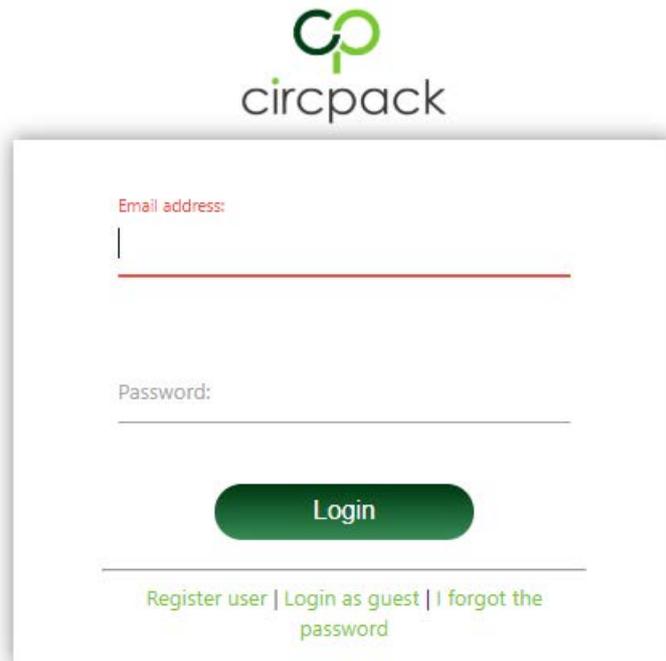
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TOOL ACCESS

1. Login

To begin, you have different options:



The screenshot shows the CIRCpack login interface. At the top is the CIRCpack logo. Below it, there is a form with two input fields: 'Email address:' and 'Password:'. A green 'Login' button is positioned below the password field. At the bottom of the form, there are three links: 'Register user', 'Login as guest', and 'I forgot the password'.

- If you have already signed up, you can enter your email and password to log in, if you don't remember your password, click on *I forgot de password*.
- If you have not signed up, you have two options:
 - If you do not wish to register you can click on *Login as guest*.
 - You can register on the web by clicking on *Register user*.

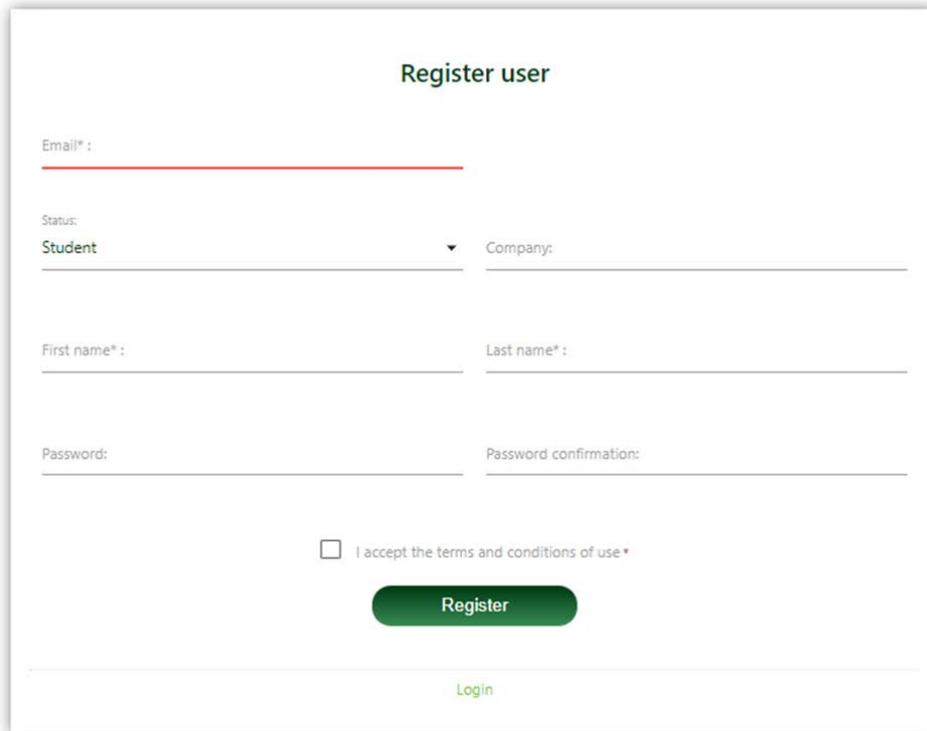
If user logs in as guest, he will log into the CIRCPACK calculation tool, but he will not be able to register the data.

If user registration is required, the New User Registration section will be accessed (**Next**).

Finally, if the login is completed successfully, the user area itself will be accessed.

2. New User Registration

To register as a new user, you will be directed to this site



The image shows a web form titled "Register user". The form contains the following fields and elements:

- Email* :** A text input field with a red underline.
- Status:** A dropdown menu with "Student" selected.
- Company:** A text input field.
- First name* :** A text input field.
- Last name* :** A text input field.
- Password:** A text input field.
- Password confirmation:** A text input field.
- I accept the terms and conditions of use *
- Register** (a green button)
- [Login](#) (a green link)

You must complete the fields, *Email*, *First name*, *Last name*, *Password* y *Password confirmation* and mark the box on the bottom to accept the terms and conditions of use. The fields *Status* and *Company* are optional.

After you have registered, you will be able to change your profile information from your user area except the Email.

If you have completed the information correctly, you can click on Register and you will be registered and directed to your user area.

USER AREA

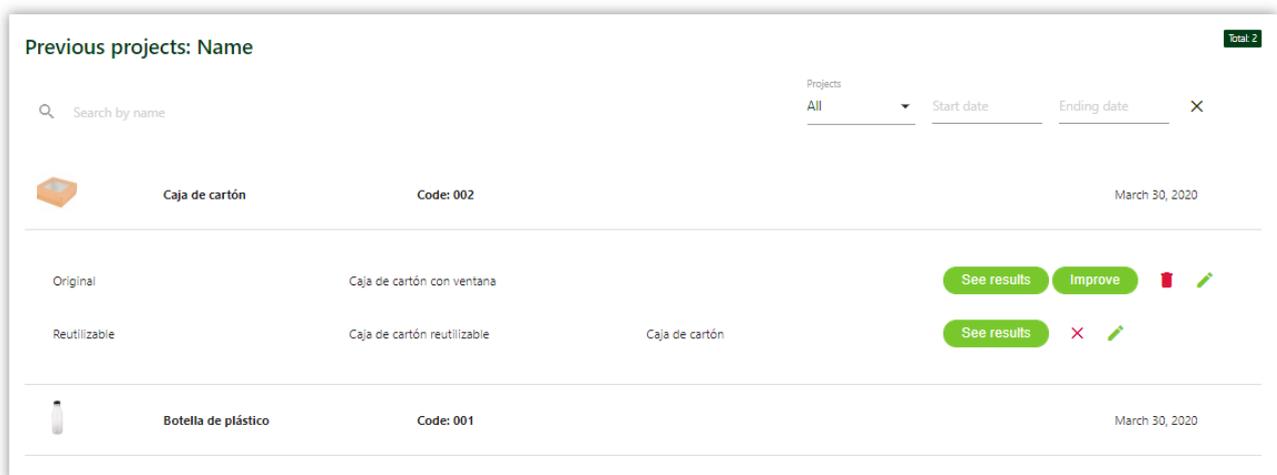
In the user area, you can find three options:

- *New project* to create and start a new project.
- *Previous projects* to check the projects you have already done.
- *Profile Setting* to edit your personal information.



1. Previous projects

On Previous projects you can see a list of the projects you have already done.



The projects are ordered by creation date, you can see the name, the code and the creation date of the project.

If you click on the project's name, for example on the project named *Cardboard box*, you will see the original version with its description and the options:

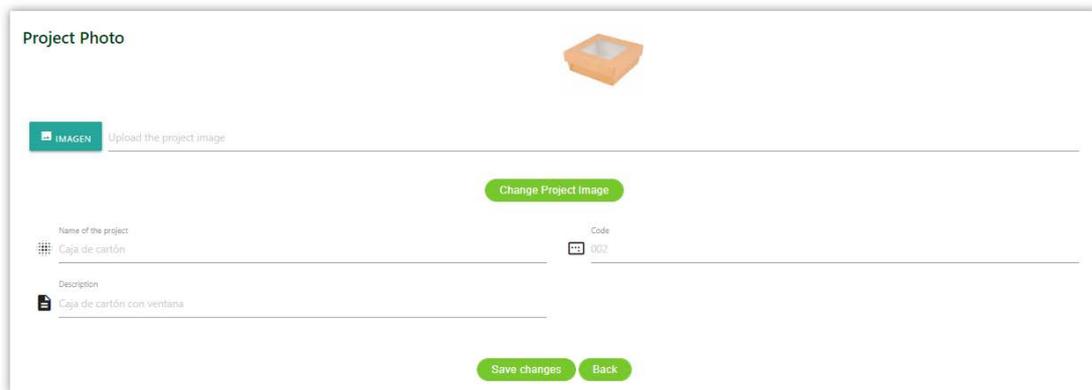
- *See results.*
- *Improve.*
- Delete, red bin icon (if you delete a project all the improvements associated will also be deleted).
- Edit, green pencil icon.

Additionally, on the top you can find a counter of the number of projects realised and three searchers:

- On the top left, a searcher by words included in the name or description of the project, you can also introduce the project's code to find it.
- On the top right, a searcher by the state of the project, complete or incomplete.
- On the top right, a searcher by the creation date of the project.

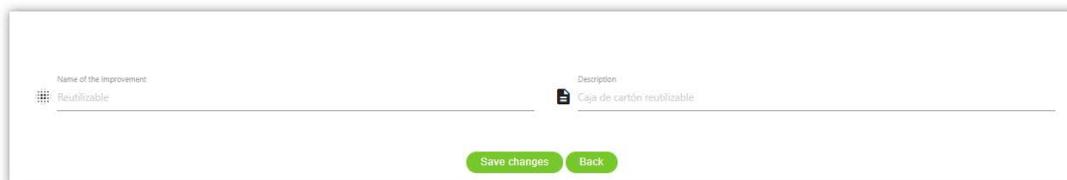
Edit information of a project or improvement

If you click on the green pencil of the original version of a project you will be able to change its image, name, description and code as you can see in the image:



The screenshot shows a form titled "Project Photo" for editing a project. At the top, there is a placeholder image of an orange cardboard box. Below it is an "IMAGEN" section with the text "Upload the project image" and a "Change Project Image" button. The form has two columns of input fields: "Name of the project" with the value "Caja de cartón" and "Code" with the value "002". Below these is a "Description" field with the value "Caja de cartón con ventana". At the bottom, there are "Save changes" and "Back" buttons.

If you click on the green pencil of a improvement, you will be able to change its name and description as you can see in the image:



The screenshot shows a form for editing an improvement. It has two input fields: "Name of the improvement" with the value "Reutilizable" and "Description" with the value "Caja de cartón reutilizable". At the bottom, there are "Save changes" and "Back" buttons.

2. Profile settings

In this section you can delete your account, all your projects and improvements would also be deleted, and change the following information:

- Add or change your profile image
- First name
- Last name
- Status
- Company
- Password

The email cannot be changed as it is the unique identifier of each registered user.

3. New project

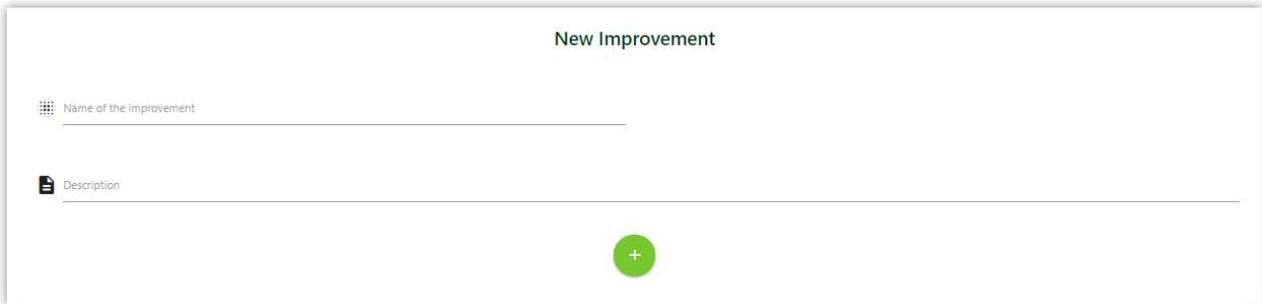
To start using the web, to start analysing a product, you have to create a new project.

Only the field Name of the project is mandatory, the rest are optional and all of them can be changed afterward as it was explained in Edit the information of a project and an improvement.

Once the required information has been completed you can start to analyse the product.

New improvement

You can create an improvement from the results area of the tool, and from the *Previous projects* section. When you create a new improvement, you will be directed to this screen:



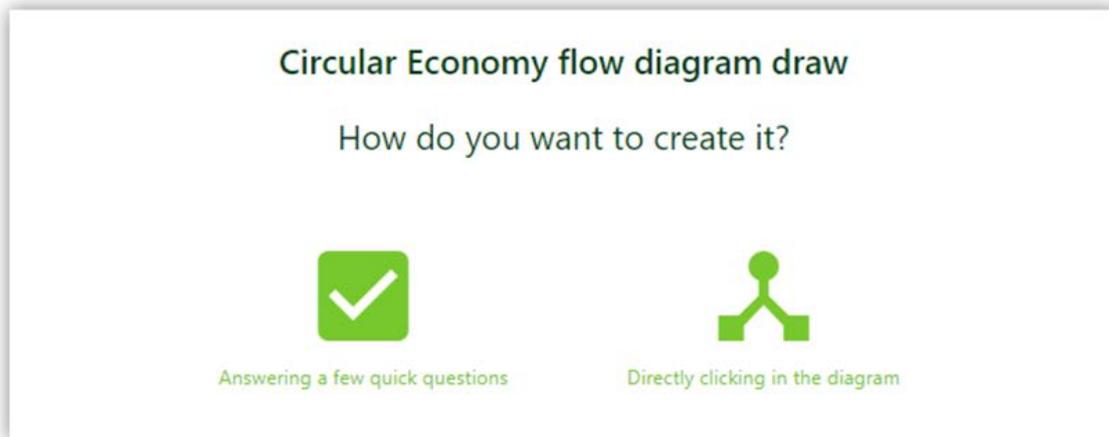
The screenshot shows a form titled "New Improvement". It contains two text input fields. The first field is labeled "Name of the improvement" and is preceded by a grid icon. The second field is labeled "Description" and is preceded by a document icon. At the bottom center of the form, there is a green circular button with a white plus sign inside.

The field Name of the improvement is mandatory, the field description is optional. Once provided the required information you can start the improvement by click on the icon +.

START A NEW PROJECT

1. Circular Economy flow diagram draw

If you use the platform as a guest or as a registered user after creating a new project, you will be directed to this site:



In this site you will be asked how do you want to create the diagram, you have two options, answering a few questions and directly clicking in the diagram.

Throughout the entire analyse of the product you will see at the top of the page the icons of the different stages of the process, the icon of the actual stage will be highlighted. You will be able to return to any of the previous completed stages by clicking on the corresponding icon.



Answering a few quick questions

If you opt for answering a few questions, you will be directed to this page:



You have to ask the current question to be able to continue to the next one, if you want to change any of the answers or check any of them you can use the arrows on the bottom right corner, in the image it is shown the case where you have returned to the first question and you have answered Yes. The circles on the top right corner shown the stage of the questionnaire, how many questions have already been asked and which is the current question, in the image you have answered the first question and you are in the first question.

Clicking in the diagram

If you opt for directly clicking in the diagram you will be directed to the following screen:



In this case you can activate and deactivate the grey icons and the arrows, once you have your desired diagram you can continue by clicking on *Ok*.

2. Materials and components

Once defined the diagram, you have to choose the main material of the product, plastic or paper/board.



Materials and components

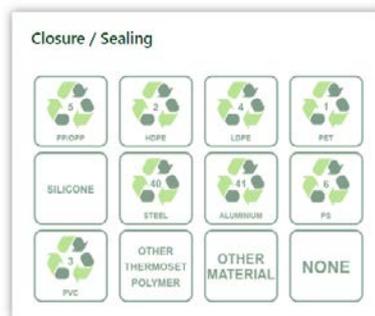
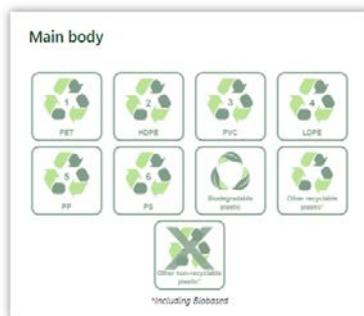


If you choose plastic, you will have to choose the materials of the main body, the closure and the labelling among the displayed options. Please note that biobased plastics are included in the options "other recyclable" and "other non-recyclable", depending on its recyclability. This selection of materials is used to evaluate its compatibility in a recycling system, since there are combinations with better performance than others. If the plastic is biodegradable/compostable, wherever it is biobased or not, the option must be selected. consequently, the compatibility of materials for recycling won't be assessed.

If you choose paper/board you will have to choose between paper and board, the barrier and other non-paper/board parts.

The different stages for plastic and paper/board are shown on the following images:

Plastic



Paper / Board

The image shows three sequential selection screens for material choice:

- Main body:** Two options: **PAPER** (with a paper icon) and **BOARD** (with a board icon). Below the options, it specifies: (Paper <math><200\text{g}/\text{m}^2</math>; board >200g/m²)
- Barrier:** Six options: **ALUMINIUM FOIL**, **PLASTIC FILM**, **WAX COATING**, **POLYMER COATING**, **OTHER BIOMASS**, and **OTHER**. A **NONE** option is also present.
- Other non-paper/non-board parts:** Two radio button options: **Yes** and **No**. Below the options, it specifies: (Including labelling, decoration, taps, windows, etc.)

Once you have selected the material a resume will be displayed where you will have two options, redoing the material selection, Back and continue, *OK*.

The resume screen displays the following information:

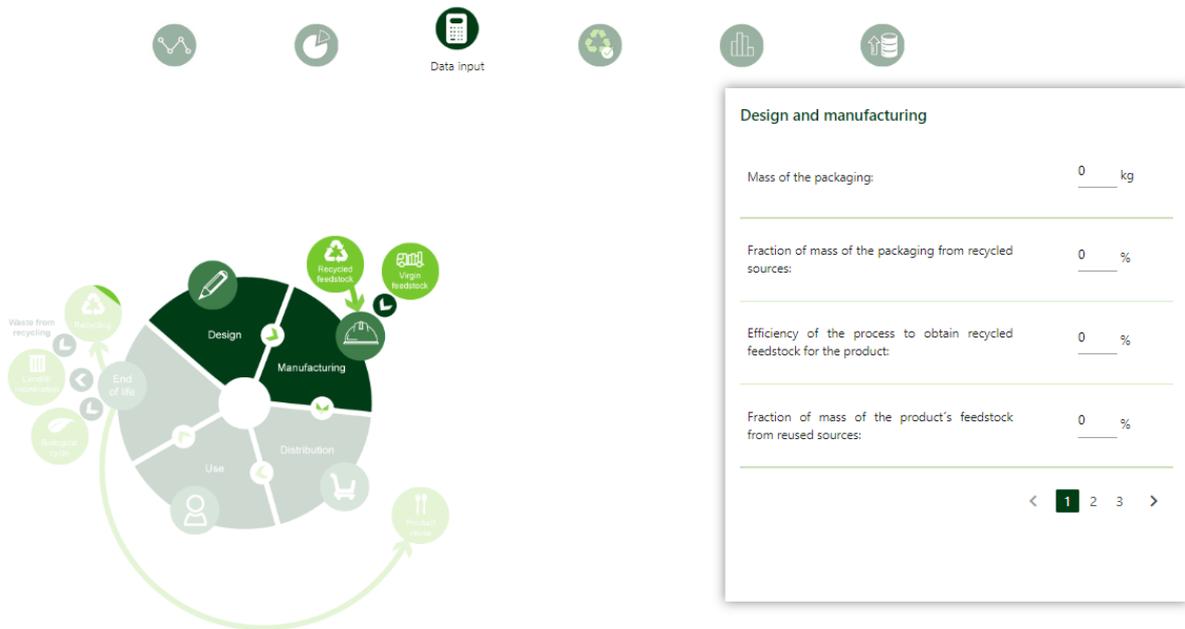
- Main body: **Paper**
- Barrier: **Aluminium foil**
- Other non-paper/non-board parts: **Yes**

At the bottom, there are two buttons: **OK** and **Back**.

3. Data input

The next stage of the analyse is the data input where you have to provide the numeric data corresponding to the different parts of the diagram, the mass field is mandatory, the rest will appear depending on the answers in the first stage, where the diagram that represents the packaging is draw.

There are three different phases of data input, each one corresponding to a life stage of the product: design and manufacturing, commercialisation and use and end of life, the current phase of the data input is highlighted in the diagram.



4. Recyclability check

The next stage of the process is the recyclability check where you have to answer several questions about some characteristics of the product; the questions will be different depending on the materials (plastic/cardboard) of the product.

In the image you can see the first questions for a plastic product and a paper/board product.



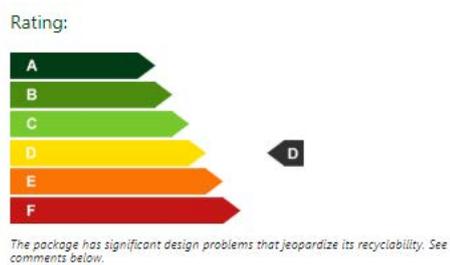
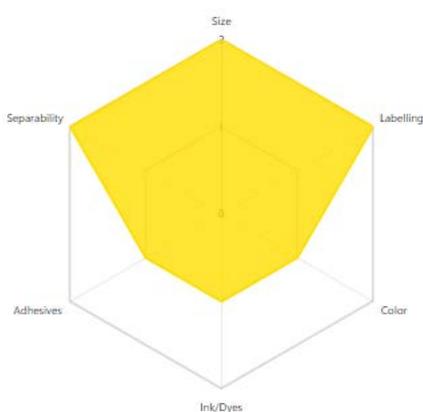
5. Results

When the analysis of the product is completed the results are displayed. Firstly, you will see the diagram of your packaging in the context of circular economy:



Secondly, you will see the recyclability check results; the diagram shows the different criteria and their level of compliance. On the right you can see the recyclability rate which determines the colour of the diagram.

In the image, the product has met the criteria of size, labelling and separability, the rest criteria can be improved, and consequently the recyclability rate is a *D*.



Next, there are some comments explaining why the corresponding criteria have not been achieved and how they could be improved.

In the example of the image, the criteria of colour, ink and adhesives have not been met, the labelling criteria has been met, however, in the comments you can see how it could be also improved.

Comments

Labelling

The packaging will be correctly sorted. However, in terms of recyclability, there are certain combinations of label-packaging that are better recycled than others. As a rule of thumb, in small labels, it is better to use the same plastic material (except for PET) or another one with different density than the packaging, so that they can be easily separated in the recycling process itself, hence not affecting the quality. See Recyclability check!

Color

Strongly-coloured plastic materials have a much lower economic value than non-pigmented plastics. This is mainly due to the lower number of final applications as compared to non-pigmented materials. Additionally, they can interfere with the common optical sorting systems (NIR) used to identify the type of plastic.

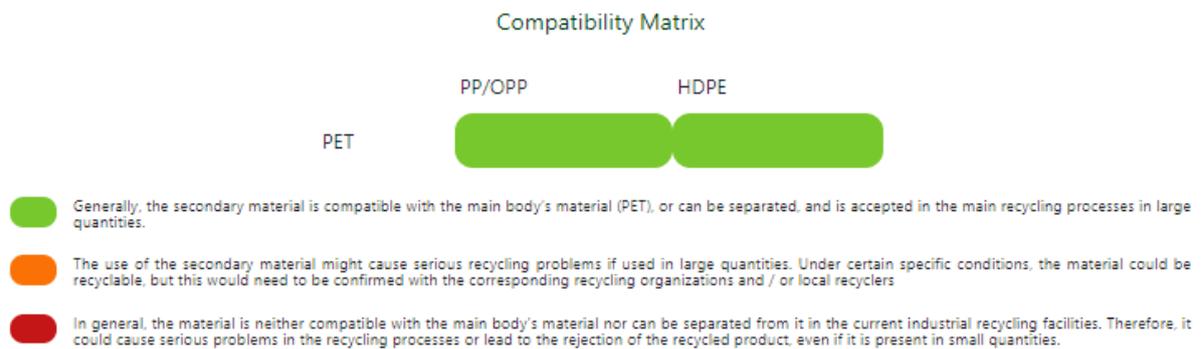
Ink/Dyes

Hazardous substances should be avoided and inks containing heavy metals, since they can contaminate the recycled plastic. Thus, it is recommended to comply with the Exclusion List for Printing Inks and Related Products, prepared by the European Technical Committee for Printing Inks (EuPIA).

Adhesives

Water-soluble (or dispersible) adhesives at temperatures between 60 and 80°C and hot melt-soluble adhesives are the best option, since they are the ones that are most easily removed in the recycling process. In any case, the amount of adhesive used and its area of application should be minimized, in order to maximize performance and facilitate the recycling process.

Next, just in the case of plastic packaging, you can see the compatibility matrix where it is analysed the compatibility of the main material and the closure and labelling materials in the common recycling process of the main body's material.



Finally, there are the indicators of the circular economy, if you mouse over the indicator's name, you will see an explanatory text.



At the bottom there are three icons with three different options, download a PDF with the results, improve the product and go back to the user area.



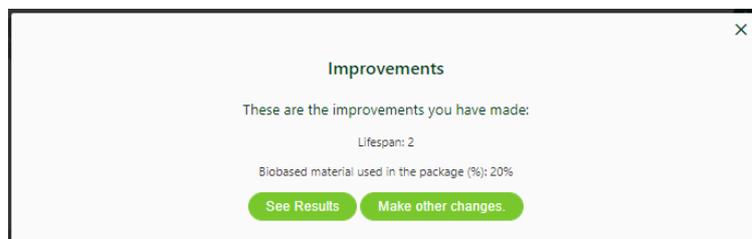
IMPROVEMENTS

Once the analysis of a product has been completed, improvements can be applied.

The improvements are divided into the three phases of the product's life, when you mouse over each of them, a brief explanation appears. Every time an improvement is applied, the corresponding icon is activated in the diagram on the left. In the example in the image, the biobased material improvement has been applied, showing the corresponding icons. The improvements can be undone as indicated by the red cross in the upper right corner of the improvement made, just click on the image to get it.



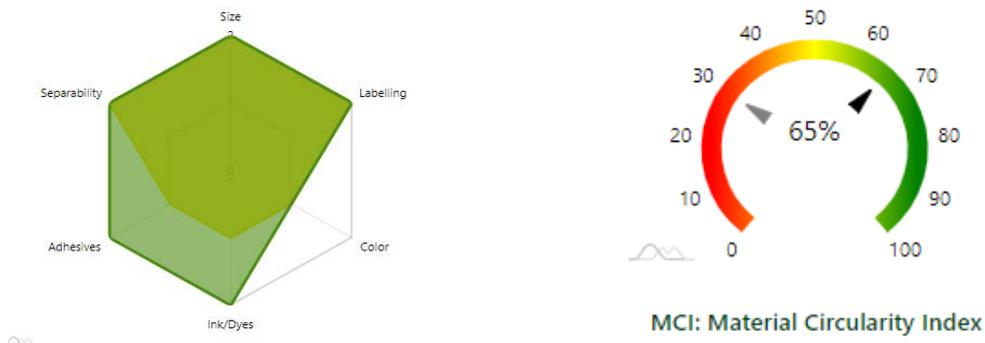
Once the three phases of the product's life have been covered, the improvement process can be completed, a summary box will be displayed indicating the improvements that have been made and asking the user if they want to make any further improvement or to see the results.



1. Results of the improvement

The results of the improvement show the results of the original product first, the base case, each of the sections was explained in the Results section, then the results of the improvement that have the same sections as the base case are shown below .

In the case of the radial diagram related to recyclability, the diagram of the base case and that of the improved case appear overlaid in order to compare both more easily, likewise, in the indicators of the improved case, the value of this case appears and the base case value.



As in the base case, you can download a PDF document with the results of the improved case. In this document, in addition to each of the sections commented in Results, the explanations of the improvements applied appear.