III Catalogue of Best Practices in Circular Economy

GOBIERNO DE ESPAÑA
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

The General Directorate of Quality and Environment Assessment, through the General Sub-Directorate for the Circular Economy (GSDCE) of the Ministry for Ecological Transition and Demographic Challenge, thanks the collaboration of the people and institutions that have contributed to this document.

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III Catalogue of Best Practices in Circular Economy (CBPCE)


A
Hoteles y alojamientos
B
C
D
Tintorerías, cristalerías, droguerías y peluquerías
E
Restauración, heladerías y panaderías
F
Pubs y discotecas
¿Te apuntas?
¡El CAA te ayuda a conseguirlo!
CERTIFICACIÓN CALIDAD AMBIENTAL
Área de Sostenibilidad Medioambiental

Contents

Contents

1. Best Practices in Circular Economy: definition and background

Circular economy (hereinafter, CE) is the convergence of three concepts: economy, environment and society. The transition from a linear to a circular economy requires a systematic change, in which not only inter-ministerial and inter-territorial cooperation will be essential, but so too constant collaboration between the public-private sectors, to support and facilitate information flows among researchers, public administrations and businesses and industries, as well as social agents and any kind of organisations and associations that are committed to the environment, sustainable development and growth, recycling and other pillars of the CE principles.

The "Towards Circular Economy" report by the Ellen MacArthur Foundation, world leader entity in this field, defines CE as *"an industrial economy that is restorative by intention and tries to make products, components and materials retain their maximum utility and value at all times, distinguishing between technical and biological cycles. In short, this new economic model tries to decouple global economic Development from the consumption of finite resources 1[1]".*

In 2015, the European Commission's Action Plan for EC[2] stated that: *"The transition to a more circular economy, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste generation minimised, is an essential contribution to the EU's efforts to achieve a sustainable, low-carbon, resource-efficient and competitive economy".*

Although the 2015 Circular Economy Action Plan set out a first sketch of the elements that comprise the circular economy, it was not until the passage of the Regulation of the European Parliament and of the Council that the Circular Economy Action Plan[3], in 2020 that a legal definition of the CE at European Union level was given[4] it defines it as: *"an economic system whereby the value of products, materials and other resources in the economy is maintained for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, and minimising waste and the release of hazardous substances at all stages of the life cycle, including through the application of the waste hierarchy".*

Similarly, the Circular Economy Spanish Strategy "España Circular 2030"[5] (hereinafter, CESS), defines the concept of CE as: "*The strategy whereby the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised, is an essential contribution to the EU's efforts to achieve a sustainable, decarbonised, resource-efficient and competitive economy".*

The latest inclusion of the circular economy concept is found in the recently passed Law 7/2022, of 8th April, waste and contaminated soils for a circular economy[6]. In article 2, it defines the CE as *"an economic system in which the value of products, materials and other resources in the economy lasts for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, and minimising waste and the release of hazardous substances at all stages of the life cycle, where appropriate by applying the waste hierarchy"* and shares certain aspects with the concept used in the CESS, which lends it a character shared by all national legislation related to the CE. This inclusion shows the importance that the CE has been acquiring, since it is the first time that this definition has appeared in national legislation in Spain.

1 https://www.ellenmacarthurfoundation.org/es/economia-circular/concepto

2 COM (2015) 614 final: "Closing the Loop: the EU Action Plan for the Circular Economy". https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52015DC0614&from=ES

3 https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52018PC0353&from=EN

4 Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on establishing a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:32020R0852&from=es

5 Ministry for Ecological Transition and Demographic Challenge (2020). "Spain Circular 2030: Spanish Circular Economy Strategy". https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/espanacircular2030_def1_tcm30-509532_mod_tcm30-509532.pdf

6 Law 7/2022, of 8th April, waste and contaminated soils for a circular economy https://www.boe.es/buscar/act.php?id=BOE-A-2022-5809

These common elements in the definitions are crucial because they mark the direction that the direct or indirect actions should take, complying with the target of a transition towards a CE. These actions shall be referred to as **Best Practices in Circular Economy** (hereinafter, BPCE). Therefore, the collection and exchange of information through BPCE between the different stakeholders is a key tool to promote the transition from the current model to a CE.

Taking into account the aforementioned premises, in 2020 and 2021, the I [7] and II[8] Catalogue of Best Practices in Circular Economy were elaborated respectively, which were very well received by a wide range of productive sectors, since the I catalogue had a total of 279 BPCE proposals from 107 entities and the II catalogue had a total of 164 BPCE proposals from 84 entities, which demonstrates the great commitment to be found in Spain to the transition towards a CE. After an exhaustive evaluation of all the proposals received, around 40 BPCEs were finally published, which obtained the best evaluation according to the criteria set in advance in each catalogue. Moreover, to achieve the widest possible dissemination, the catalogues were published in both Spanish and English.

Such was the scope of this exchange of information about BPCE that the first Circular Economy Action Plan 2021-2023[9] (hereinafter, CEAP 2021-2023),), developed on the basis of the CESS, included, within the action line of Awareness and participation, the measure *"to promote the exchange of information about BPCE" 6.1.5. Best Practices in Circular Economy (BPCE),* where it is stated that MITECO, within the framework of public-private partnership, will develop the aforementioned catalogue, thus making this publication even more relevant.

7 Ministry for Ecological Transition and Demographic Challenge (2020) "I Best Practices in Circular Economy Catalogue of Best Practices in the Circular Economy" https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/fichas-bpec-i-en-web_def_tcm30-525011.pdf

8 Ministry for Ecological Transition and Demographic Challenge (2021) "II Best Practices in Circular Economy Catalogue of Best Practices in the Circular Economy" https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/fichas-bpec-ii_en-web_def2_tcm30-538142.pdf

9 Ministry for Ecological Transition and Demographic Challenge (2021). "I Circular Economy Action Plan 2021-2023. " https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/plan_accion_eco_circular_def_nipo_tcm30-529618.pdf

2. Objective

The transition to a CE in Spain requires a coordinated and responsible action across the Public Administration, the business sector and society as a whole. The Spanish National Administration, through the General Sub-Directorate for Circular Economy (GSDCE) of the Ministry for Ecological Transition and Demographic Challenge (MITECO, as per the Spanish) intends to promote the exchange of BPCE between the main stakeholders in order to create synergies that foster said transition (figure 1).

Therefore, in response to this requirement, this catalogue aims to compile the different actions identified as BPCE so other stakeholders may benefit from these experiences and join the transition.

On this occasion, two types of BPCE have been compiled: those currently in operation and which show results supporting their operability, known as **implemented BPCEs**,and those that are more innovative and are currently in the Development phase, known as **BCPE pilot**. In this way, all BPCEs that were discarded in previous editions because they did not provide final results and/or were under study and had not been applied at industrial level are included.

In any case, the inclusion of certain activities or materials as BPCEs does not prejudge the acquisition of any legal status. With regards to the legal conditions of waste, by-product, end of waste status, recovery or recycling, among others, the provisions of Law 7/2022, of 8th April, waste and contaminated soils for a circular economy shall apply.

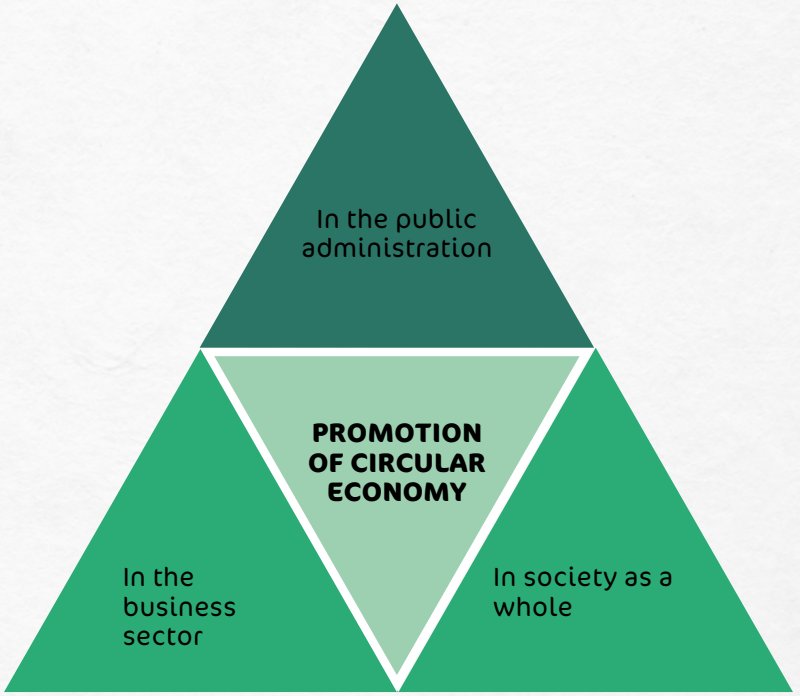


Figure 1: Promotion of CE among the main stakeholders. Source: Authors.

3. Methodology

Phase I: Identification and selection of BPEC

In order to identify an action as a BPCE, it must be based on the established general principles of the CE and comply with the minimum circularity criteria set out for each area of action.

1. GENERAL PRINCIPLES OF CE ADOPTED TO IDENTIFY BPCE

To achieve the BPCE category, an action must focus on a series of principles interconnected and inherent to the definition of CE. These principles establish the basis for entities to adopt their practices for the transition to CE:

1. **Rethink and take responsibility:** renew current models in all areas of action (design, production, consumption, use, exchange, waste management, etc.) to contribute, directly or indirectly, to the transition to a CE. Assume responsibility (social, economic and environmental) for the effects of decisions and activities in each action. Dematerialise or virtualise, share, redesign according to eco-design criteria, virtualise.

2. **Reduce:** increase resource efficiency in manufacturing and shift to more circular resources. Address real needs. Increase the useful life and performance of products by avoiding replacing them with newer ones. Replacing hazardous substances and substances of exceedingly high concern[10] .

3. **Reuse:** Reuse a product that is still in good condition and fulfils its original function for the same purpose for which it was conceived.

4. **Repair and/or upgrade:** Repair and maintenance of a defective product so that it can be used for its original function. Restore an old product and bring it up to date (as specified for its quality level).

5. **Recover:** Procure secondary raw materials (MPS)[11] and critical raw materials (MPF)[12].

6. **Re-manufacture:** Use waste or parts of waste in a new product (and as a new condition). Use by-products and products with declaration of by-product and/or end-of-waste. Reprocessing of materials used in backfilling operations.

7. **Recycle:** Recover materials from waste to reprocess them into new products, materials or substances, either for their original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

10 Reliable documentation shall be provided to demonstrate the percentage replacement with substances of very high concern or hazard.

11 Thus, the term SRM encompasses the legal concepts of by-product and end-of-waste as defined respectively in articles 4 and 5 of the new Law 7/2022, of 8th April, waste and contaminated soils for a circular economy. https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/prevencion-y-gestion-residuos/comision-coordinacion/Procedimiento-Evaluacion-Subproducto.aspx

12 CRM identified by the European Commission [COM (2020) 474 final] as raw materials that are vital to the economy and which involve a high supply risk for the EU. https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

2. AREAS OF ACTION

In order to facilitate the identification of BPCE and in accordance with the different lines of action within the European framework and namely with regards to the lines of action defined in CESS "España Circular 2030", scopes of action (Figure 2) were defined to classify the minimum circularity criteria that BPCE must comply with in higher category groups.

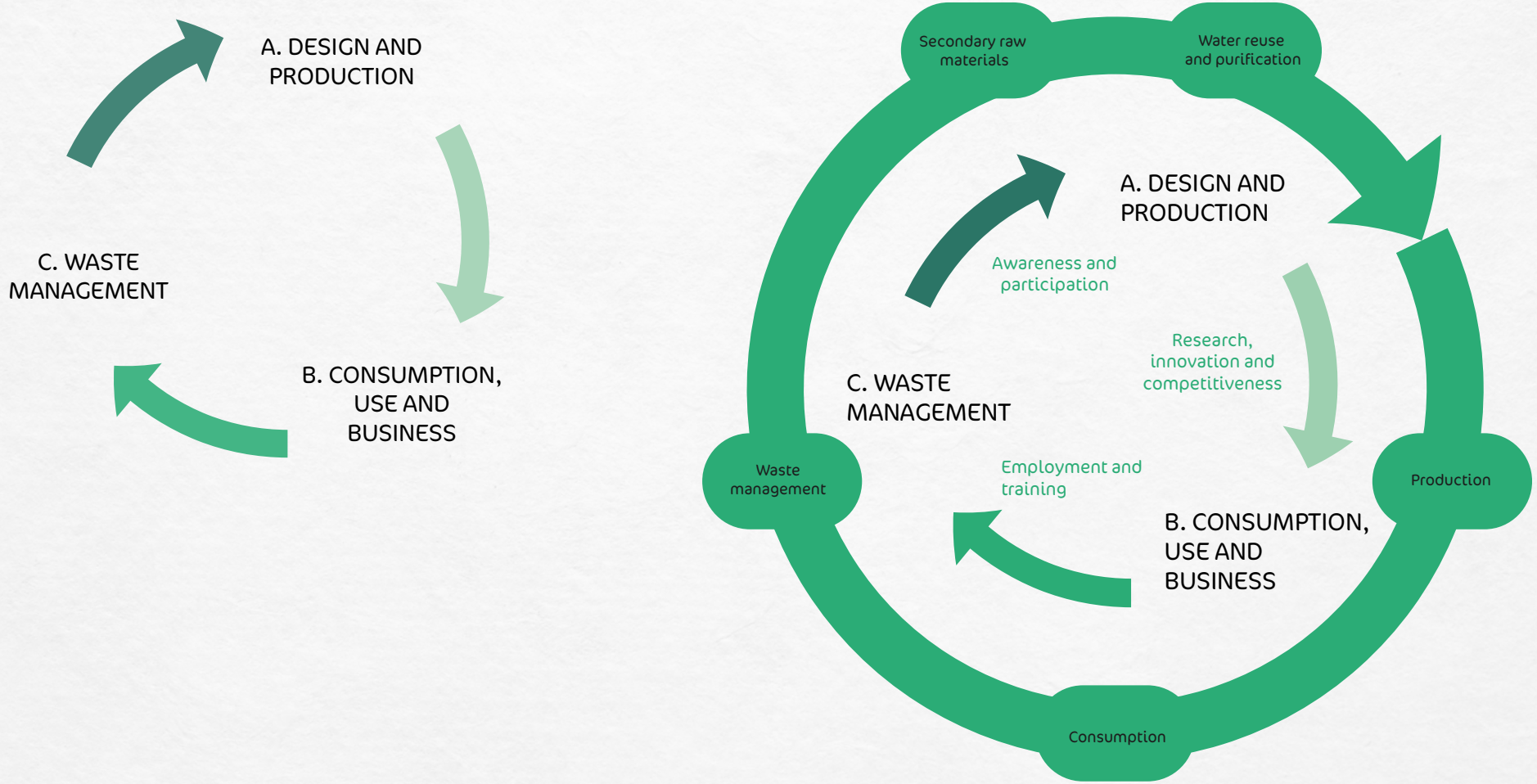


Figure 2. Superior groups or scopes of action to identify of BPCE. (Left) Relationship between the areas of action and the CESS's main lines of action (Right) Source: Authors

3. MINIMUM CIRCULARITY CRITERIA

Any action that intends to be considered as a BPCE must pursue and prove that it complies with the minimum circularity criteria defined for each of the scopes of action:

Minimum circularity criteria for BPCE by scope of action.
Source: Authors.

SCOPE OF ACTION	MINIMUM CIRCULARITY CRITERIA
GROUP A: **DESIGN AND PRODUCTION**	a. A reduction and more efficient use of consumed resources (raw materials, water and energy), including whether it: i. increases: durability, resilience, efficiency, functionality, possibility of upgrade repair and recycling of products (including the different materials therein) and recycling rate, ii. replaces resources with more sustainable ones[13] , iii. increases the use of secondary raw materials[14] . b. Waste prevention for both of the product itself and those generated during the activity, including whether it: i. provides transparency of information throughout its life cycle. c. A reduction in the impacts associated with its activity.
GROUP B: **CONSUMPTION, USE AND BUSINESS**	a. A reduction in and more efficient use of products, goods and resources consumed, including whether it: i. creates a change towards more sustainable and circular products, goods, resources and services. b. Prevention of waste generated in use and consumption, including whether: i) extends the useful life of products and goods. c. A reduction in the effects associated with consumption, use or business.

13 Where appropriate, documentary evidence of the rate of replacement of substances of very high concern or hazard shall be provided.

14 If the action requires it, the necessary authorisations for treating the waste referred to in the BPCEs (authorised manager, declaration of by-product or end-of-waste status) must be in place https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/prevencion-y-gestion-residuos/comision-coordinacion/Procedimiento-Evaluacion-Subproducto.aspx

SCOPE OF ACTION	MINIMUM CIRCULARITY CRITERIA
GROUP C: WASTE MANAGEMENT	a. To encourage the effective implementation of the waste hierarchy principle6, both of the product and of each of its constituent parts, through actions that increase and encourage prevention, preparation for reuse, repair or recycling, including whether it: i. improves waste collection and sorting, ii. improves waste traceability. b. An increase of the recovery of the circular value, including whether it: i. assumes recovery of high quality secondary raw materials and promotion of their market for reintegration into production processes[15], ii. increases, improves or encourage the reuse and purification of wastewater. c. A reduction in the effects associated to waste mismanagement, including if: i. it means minimising waste incineration and disposal, even in landfills.

15 If the action requires it, the necessary authorisations for treating the waste referred to in the BPCEs (authorised manager, declaration of by-product or end-of-waste status) must be in place . https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/prevencion-y-gestion-residuos/comision-coordinacion/Procedimiento-Evaluacion-Subproducto.aspx

Phase II: Dissemination of the initiative

The GSDEC of the MITECO issued the call for the third edition of the catalogue by publishing it on the Ministry's own website[16] and once again invited the main agents involved in the CE to participate by sending those practices they were carrying out to accelerate the transition to a CE.

Along with the invitation to participate, a technical data sheet was provided with instructions, assessment criteria and any additional considerations necessary to fill it in.

As mentioned above, this edition has a new feature compared to previous catalogues, since the BPCE collected are classified into two categories: **Implemented BPCE and BPCE pilot.** Because of this, and to avoid possible confusion and to make it easier to collect information, a fact sheet and a document with the specific assessment criteria for each of the above-mentioned categories were provided.

Phase III: Collection and assessment

Once all the proposals received had been compiled, each was analysed individually according to the criteria in place for its category.

A common set of criteria has been used for to assess all the BPCEs and specific ones that vary according to the categories mentioned above. These are:

COMMON CRITERIA

Firstly, and as an essential prerequisite for its assessment, it was verified that the entity had signed the "statement of compliance" the BPCE would have provided the relevant legal information if required by the BPCE to do so.

Other aspects were then positively assessed, such as: the fact that the entity is a member of the Circular Economy Pact[17] the following aspects were also rated positively: whether the company has any environmental certification, whether it has an active sustainable purchasing policy or whether the practice is carried out in collaboration with companies from other sectors, thus encouraging the creation of new value chain models.

Other criteria considered were[18] :

·**Compliance with the minimum circularity criteria:** these are used to determine whether an action may be considered a BPCE.

·**Relevance for CE:** BPCE directly reflect a large positive impact aimed at the transition to CE due to its implementation.

·**Relationship with society:** practices that reflect, as far as possible, the involvement with society and how society collaborates in exercising circularity.

SPECIFIC CRITERIA

The criteria considered for assessing the BPCEs according to the category to which they belong are set out below. In both cases, the criteria used have served to adapt the assessment to the characteristics of the BPCE themselves, not implying a change of criteria or a greater requirement depending on the category assessed.

16 https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/buenas-practicas-economia-circular/

17 https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/pacto/

18 It should be noted that the assessment was made on the basis of the information provided by the entities and did not involve a check on the economic, technical and environmental viability of the initiatives. These criteria were provided together with the fact sheet.

Implemented BPCE

Since these are BPCE with a track record of proven effectiveness, the following criteria were applied:

- **Innovation:** The BPCE is an innovative response, a new initiative within its scope of action to respond to the needs or criteria raised.
- **Scalability:** The current action has the potential to increase profits without increasing the unit cost of production/marketing, while maintaining the initial quality.
- **Durability:** this BPCE is sustainable over time.
- **Quantifiable or measurable indicators:** for an action to receive a favourable assessment, it was borne in mind that the information had been sufficiently complete, clear and objective; that its feasibility could be demonstrated; and that results were provided.

BPCE pilot

In this case, only the following criterion is considered since, as it is a BPCE pilot, its innovation is assumed and its scalability and durability cannot be measured, since it is still in the research and Development phase.

- **Intermediate results and quantifiable or measurable indicators:** the state of the implementation of the BPCEs and the proof of the achievements made or to be made by means of verifiable intermediate results or objectives were considered in order for an action to have obtained a favourable assessment. Moreover, it was assessed whether the information had been presented with adequate completeness, clarity and objectivity and whether its feasibility could be demonstrated.

Based on these guidelines, and comparably to what was done in previous catalogues, a multi-criteria analysis methodology was used, which allows a quantitative assessment to be made as objectively as possible of each practice receive. Thus, a higher score was given to those initiatives that are more relevant and more linked to the circular economy.

To prepare the 3rd CBPCE, the highest-rated actions were selected for each category.

4. Contents of the sheets

The BPCE published in the following catalogue are divided between the two aforementioned categories (implemented and pilot) although they are presented in the same way. The elements included in the fact sheet are:

1. BPCE name: a title identifying the action.

2. Location: place where BPCE takes place.

3. Scope: Global, International, European Union, National, Regional, Province, Local.

4. Scope of action and relevance of BPCE in the CE: indicates the scope of action in which BPCE is framed (see Areas of action) and describes the significance of the action in the CE.

Design and production

Consumption, use and business

Waste management

5. BPCE objectives.

6. Description of the action.

7. Key results: main achievements (environmental, economic and social) obtained with the implementation of the BPCE.

8. CE principles: among the general principles adopted for identifying BPCEs, those with which it identifies are indicated (see General CE Principles adopted for the identification of BPCE).

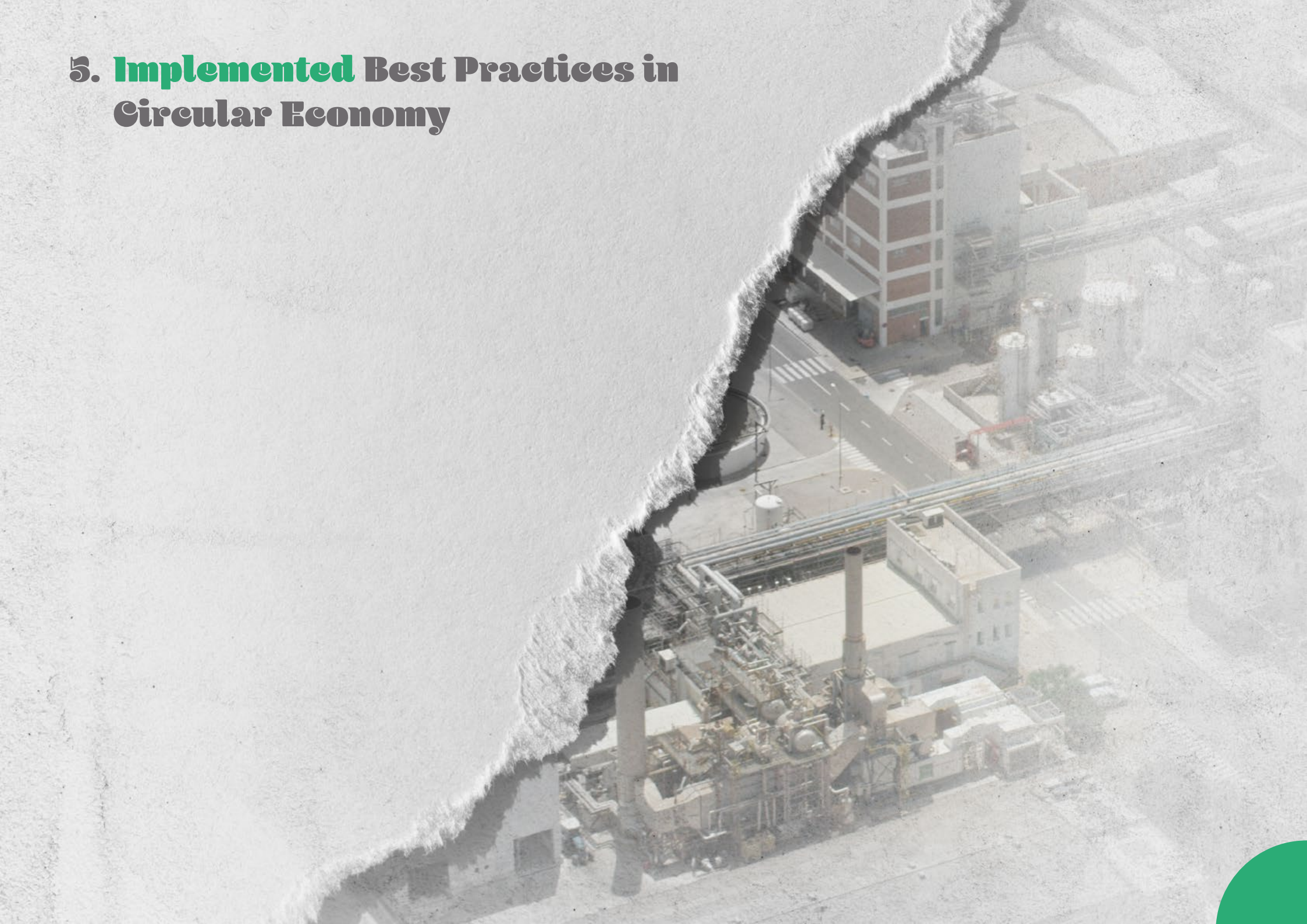
9. SDG commitments to which action contributes to achieving the goal.

10. Difficulties or challenges faced by the entity to execute the BPCE.

11. Entity responsible for the BPCE: name of the entity and contact person information for the entities that requested it during the submission of the information.

12. Further information: this section will contain further information to be highlighted in the catalogue.

5. Implemented Best Practices in Circular Economy



The catalogue has been distributed according to the sector to which the implemented BPCEs belong (classification according to NACE 2009 code) as follows:

Implemented BCPEs

C. Manufacturing

2014-Manufacture of other organic basic chemicals	• Reuse of acidic water for physico-chemical treatment

E. Water supply, sewerage, waste management and remediation activities

3821-Treatment and disposal of non-hazardous waste	• FINHAVA: Circular Economy Platform

G. Wholesale and retail trade; repair of motor vehicles and motorcycles

4711-Retail sale in non-specialist stores, with food, beverages or tobacco predominating	• Trencadis murals in meat and fish sections of supermarkets

H. Transportation and storage

4931. Urban and suburban passenger land transport	• Carpooling: economical and sustainable travel

N. Administrative and support service activities

8129-Other cleaning activities	• Rapacinonline: preparation for the re-use of donated IT equipment

O. Public administration and defence; compulsory social security

8411-General public administration activities	• Label for sustainable audiovisual productions

Selection of Implemented BCPE

ológica y colaborativa a través de la cual monitorizamos todo el ciclo de los alimentos y residuos
culando su huella de carbono y haciendo posible la economía circular. Nos permite conocer el ciclo
mendo o un melón que se convierten en residuos y se transforman en compost, para nutrir el campo
mentos. Todo un proceso de reducción y reutilización en el que tú eres protagonista.

Implanted

Reuse of acidic water for physico-chemical treatment

La Canonja, Tarragona, Catalonia Local

Scope and significance of BPCEs in the CE

Use of more efficient technologies in production processes which in turn imply a reduction in the use of resources and waste generated.

Actions for the reuse of water in industrial processes.

Objectives

1. To reuse the acidic wastewater produced at the Grace Catalysts & Materials SL. catalyst plant, reusing its properties as a coagulating agent for the physicochemical treatment of the site water at BASF.
2. To avoid the use of single-use agents for acidification, coagulation of water in physico-chemical site treatment at BASF.
3. To promote the use and recycling of wastewater when it can still be used in another process.
4. Economic savings in coagulants and acidifying agents.
5. To improve the water footprint.

Description

The water from the dispersion plant of BASF Española S.L., prior to its removal to the biological reactor, must undergo physico-chemical treatment consisting of coagulation, acidification, neutralisation and flocculation to remove colloidal substances incapable of being biodegraded biologically.

One of Grace Catalysts & Materials S.L.'s wastewater streams have characteristics and chemical properties suitable for physicochemical treatment. Grace's acidic waters have pH levels and titanium oxychloride concentrations necessary for proper coagulation and flocculation, replacing single-use raw materials such as aluminium sulphate and hydrochloric acid, thus reducing the volume of water needed for the treatment. The recycling of this acidic water is made possible by a system of tanks and pipes that provides a constant flow from the Grace plant to the reaction chambers of the site's physico-chemical treatment. This facilitates cooperation between BASF and GRACE, thus optimising the process and minimising the environmental impact.

Sector

CE Principles

2 3 5 7

Key Results

Materials
Waste
Water

Productivity
Innovation
Cost savings

Awareness
Cooperation
Sustainable development

SDG commitments

9 12 17

Difficulties or challenges

- Absence of legal standards and definitions.
- Insufficient demand.
- Quantity problems.
- Price volatility.

Entity

BASF Española S.L. in collaboration with Grace Catalysts & Materials S.L.

More information: https://www.basf.com/es/es.html

Implanted

FINHAVA: Circular Economy Platform

Mallorca, Balearic Islands

Regional

Scope and significance of BPCEs in the CE

Use of more efficient technologies in production processes which in turn imply a reduction in the use of resources and waste generated.

Collaborative consumption measures which, facilitated by digital platforms and communities, share and exchange resources, thus making more efficient use of them.

Measures to promote the recovery of secondary raw materials (SRM) and critical raw materials (CRM).

Objectives

1. To change the paradigm of economic activity linked to tourism towards sustainable tourism.
2. To contribute to improving waste management by helping to improve the community's recycling objectives.
3. To prevent and reduce food waste.
4. To promote low carbon footprint supply chains.
5. To boost the local economy and the primary sector.

Description

Finhava is the circular economy platform promoted by Tirme, which has a commitment to an innovative business model that raises awareness of the importance of the circular economy and makes it easier to establish alliances between producers and consumers, thus enabling traceability of products, sharing experiences and promoting environmental policies and innovative technologies, from farmers to catering and trade and, of course, the reuse of food waste.

Entity

Tirme, S.A. in collaboration with the hotel sector (Iberostar, Meliá, RIU, Marriott, Viva Hotels), the agricultural sector (Son March, Agromallorca, Frutas Huguet, Alivert, Agricola Dalmau) and the technology Sector (Wdna, Vottun).

Rafael Alberto Guinea Mairlot (gerencia@tirme.com).

Sector

CE Principles

1 2 3 5 7

Key Results

- Materials
- Emissions
- Energy
- Waste
- Water

- Productivity
- Competitiveness
- Revenue potential
- Innovation

- Employment
- Awareness
- Cooperation
- Sustainable development

SDG commitments

Difficulties or challenges

- Lack of circular regulation.
- Behavioural change / lack of awareness or cooperation.
- Quantity problems.

More information: www.tirme.com

https://www.finhava.com/index.php

https://youtu.be/FKgXYybThxg

Implanted

Trencadis murals in meat and fish sections of supermarket

Throughout Spain and Portugal

International

Scope and significance of BPCEs in the CE

Measures for/to encourage recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To provide an occupation for people with disabilities through foundations and work centres
2. To give a second life to ceramic products that, if not reused, would end up as waste
3. To expand Mercadona's commitment to the SDGs as part of its Corporate Social Responsibility policy

Description

Mercadona makes social innovation a priority and a visible factor in all its shops. Using the trencadís technique, people with intellectual disabilities turn excess ceramic production, donated by Pamesa Cerámica, into murals used to decorate the meat and fish sections. Thanks to this work, these artists can train, work and develop their concentration and teamwork skills.

In 2021, the company invested more than 0.78 million euros and installed 163 murals. All the participating foundations and work centres have manufactured a total of 3,551 units for the execution of Trencadís in 2021, with a forecast of manufacturing 2,442 more during 2022. This project was set up in 2011 by Mercadona and Pamesa Cerámica and, since then, the supermarket company has installed more than 1,661 murals.

Sector

CE Principles

1 3 5

Key Results

Materials
Waste

Innovation
Other

Employment
Awareness Cooperation
Sustainable development

SDG commitments

Difficulties or challenges

- Behavioural change/lack of awareness or cooperation.
- Lack of incentives.

Entity

Mercadona in collaboration with Pamesa Cerámica and 32 foundations and work centres.

More information:

www.mercadona.es

www.pamesa.com

Implanted

Sector 11

Carpooling: economical and sustainable travel

The entire national territory (except for the autonomous cities of Ceuta and Melilla)

National

Scope and significance of BPCEs in the CE

Collaborative consumption measures which, facilitated by digital platforms and communities, share and exchange resources, thus using them more efficiently.

Objectives

1. To promote collaborative and shared-use schemes.
2. To encourage shared mobility among Spaniards.
3. To contribute to reducing transport emissions and to improving air quality in cities.
4. To reduce congestion on major roads, as well as on the highway.

Description

BlaBlaCar is a car-sharing platform whose model consists of bringing users together to make joint journeys in a private vehicle and share the costs of the trip. We have a community of more than 7 million users in Spain and 100 million in the 22 countries where we operate. Car sharing means less traffic, less pollution and less fuel consumption.

Entity

Blablacar.

More information: https://www.blablacar.es/

CE Principles

1 2

Key Results

Emissions

Cost savings

Awareness
Sustainable development
Other

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Lack of incentives.
- Access to finance.

Implanted

Rapacinonline: preparing for the re-use of donated IT equipment

Gijón, Principality of Asturias

Local/Regional

Scope and significance of BPGEs in the CE

Measures that encourage the re-use of a product that is still in good condition and fulfils its original function (and is not a waste) for the same purpose for which it was conceived.

Objectives

1. To meet a social need brought about by the pandemic.
2. To give computer equipment a second life.
3. To raise awareness of the circular economy across a broad spectrum, both at citizen and business level.

Description

Based on a shortcoming observed during the COVID-19 pandemic, the initiative began with the collaboration of EMULSA, the NGO Hacedores & Maker, Cogersa, the General Directorate for Innovation of the Government of the Principality of Asturias and the company Noergia. The donation of computer equipment in use was requested by various media. Private companies, local councils and citizens responded with the initiative. Hacedores & Makers mobilised 15 VET student volunteers who set up the equipment and were delivered for re-use through the Senior Leadership Team of eight state schools.

Sector N

CE Principles

3 4

Key Results

Water

Knowledge
Awareness
Cooperation

SDG commitments

11 12 13

Difficulties or challenges

- Administrative burden.
- Quality problems.
- Time-consuming processes.

Entity

Empresa Municipal de Medio Ambiente de Gijón, S.A. (EMULSA) in collaboration with H&M (Makers & Maker).

Sergio de Lucas de Benito (emulsa@emulsa.org).

More information: https://gijon.es/es/directorio/empresa-municipal-d-servicios-de-medio-ambiente-urbano-de-gijon-sa-emulsa

Implanted

Label for sustainable audiovisual productions

Málaga, Andalusia

Local

Scope and significance of BPCEs in the CE

Promotion of short circuits and self-sufficiency in consumption (the local economy) such as actions to ensure a more sustainable local food chain

Promoting the consumption of goods, products or services with environmental and social information systems, which offer transparency to provide consumers with information related to environmental characteristics and social criteria, to make better-informed consumption decisions.

Objectives

1. To raise awareness in the audiovisual Sector of the need to implement environmental protection measures.
2. To certify the good environmental practices of the companies that choose Malaga as a location for their audiovisual works.
3. To adjust the working procedures of audiovisual companies to the entity's sustainability criteria.
4. To promote the circular economy.

Description

Malaga Film Office, the City Council's film recording office attached to Malaga Procultura, includes obtaining the sustainable production seal, as a free service, to achieve a cooperation between the environmental effects associated with audio-visual productions and the adoption of solutions to minimise their consequences.

Those audio-visual productions that wish to join this project may contact the Environmental Advisory Centre (EAC) for advice about environmental issues. With the data they provide on the production they are going to undertake, the EAC will prepare a report indicating the improvements or alternatives to make them more sustainable. Positive application of these measures will lead to obtaining the Certificate of Sustainable Production and Malaga Film Office will give them the seal of approval.

Making an audio-visual production sustainable is a process that must involve the whole team and all work phases. The network of sustainable establishments managed by the CAA will make it easier to include circularity standards in the use of resources and materials associated with audio-visual productions.

Sector

CE Principles

1 2 3 4 5 6 7

Key Results

Materials
Emissions
Energy
Waste
Water
Other

Cost savings

Knowledge
Awareness
Cooperation
Sustainable development

SDG commitments

11 12

Difficulties or challenges

- Behavioural change/lack of awareness or cooperation.
- Lack of incentives.
- High initial investments.

Entity

Malaga City Council in collaboration with Malaga Film Office, Promálaga and Centro Asesor Ambiental (CAA).

Luis Medina-Montoya Hellgren (imedinam@malaga.eu).

More information : https://bioeduca.malaga.eu/es/centro-asesor-ambiental/

6. Best Practices in Circular Economy pilot

The catalogue has been distributed according to the sector to which the implemented BPCEs belong (classification according to NACE 2009 code) as follows:

	BPCE pilot
C. Manufacturing	
1083-Processing of tea and coffee	• Sorting and recycling of small plastic materials • Recycling small metal waste
D. Electricity, gas, steam and air conditioning supply	
3516-Conventional thermal electric power production	• Melilla Second Life: Second life batteries for energy storage
E. Water supply, sanitation, waste management and remediation activities	
3821-Treatment and disposal of non-hazardous waste	• New process for mechanical recycling of plastic mixtures from residual waste fraction • Sustainable management of used face masks
K. Financial and insurance activities	
6420-Activities of holding companies	• Circular economy project in residential construction • RecyclableBlade: recyclable blade for wind turbines

BPCE pilot

M. Professional, scientific and technical activities

7120-Technical testing and analysis	• Use of cork waste for tree surrounds and playground pavement • Exfoliating applications of cork by-products in cosmetics
7211-Research and experimental Development on biotechnology	• LEVEL-UP: extending the life of obsolete heavy industrial equipment
7219-Other research and experimental Development on natural science and engineering	• MANDALA project: thermo-reversible adhesive for plastics • OLEAF4VALUE: experimental valorisation of olive leaves • Si-Recycle: Recycling and valorisation of silicon solar panels

S. Other services activities

9411-Activities of business and employers membership organisations	• Coffee Grounds Shoes: circular economy applied to footwear
9499-Activities of other membership organisations n.e.c.	• Alliance for the collection and recycling of used coffee capsules
9609-Other personal services activities n.e.c.	• Study of the contribution of technical standards to the circular economy

BPCE pilot selection

Pilot

Sorting and Recycling of small plastic materials

Valencia, Valencian Community

Local/Regional

Scope and significance of BPCEs in the CE

Measures to improve waste collection and separation.

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To increase the percentage of recycled plastic by offering a solution for small plastic materials.
2. To reduce the rate of waste and rejects to landfill from the packaging sorting plant.
3. To support the modernisation and continuous improvement of recycling plants in Spain.
4. To educate citizens about the environment to encourage the use of the yellow container for small plastics.

Description

A public-private partnership project between Nestlé, the Valencian Regional Government, Valencia City Council and Vaersa, which aims to provide a solution to the problem of separation of waste from the wastewater and recycling of the small plastics that are currently filtered through the trommel screen in the packaging-sorting plants and which end up in landfill. This consists of installing a separation technology in the fines line of the Picassent packaging sorting plant that enables the separation of coffee capsules, polypropylene (PP) caps and lids, polyethylene (PE) caps and lids and polystyrene (PS) yoghurts into 4 fractions differentiated from the rest of the materials in the fines line, and their subsequent delivery to specialised recyclers that ensure their circularity. Once the project has begun, in-plant characterisations will evaluate the results and a Green Paper will be produced to demonstrate the feasibility of recycling these small plastics.

To drive this project, a Small Plastics Recycling Alliance is being set up with other actors in the small plastics value chain.

Sector

CE Principles

1 7

Key Results

Emissions
Waste

Productivity
Potential income

Employment
Knowledge
Sustainable development
Awareness
Cooperation

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Administrative burden.
- Complex process to circulate it.
- High initial investments.
- Access to finance.

Entity

Nestlé Spain (Nescafé Dolce Gusto Division) in collaboration with Valencia City Council, The Valencian Regional Government, Alianza para el Reciclaje de los Pequeños Plásticos (ARPP) and Vaersa.
MªAngeles Möller Vendrell (Angeles.Moller@es.Nestle.com).

More information: www.dolce-gusto.es

Pilot

Recycling of small metal waste

Valencia, Valencian Community Local/Regional

Scope and significance of BPCEs in the CE

Measures to improve waste collection and separation.

Objectives

1. To recycle those small aluminium and steel products, containers or parts of containers that are lost and sent to landfill in the current system, to give them a second life.
2. To strengthen the current system by ensuring and demonstrating that it is possible to recycle more aluminium and steel and make these materials more circular.
3. To educate about the infinite recyclability of aluminium and steel as a flagship material in the circular economy.

Description

Implementation of a pilot project at the waste sorting plant in Picassent, with the pioneering installation in Spain of a Foucault machine and a magnet in the fines line, which makes it possible effectively to sort small-sized aluminium and steel products such as coffee capsules, beverage and tin cans, plates, lids, wine capsules and champagne corks, aluminium foil, among others, which until now were not being properly sorted and ended up in landfill.

Likewise, communication and public awareness campaigns have been used to inform citizens about what materials can now be deposited in the yellow bin; they have been key to the project's success. One year after its launch, the project seeks to extend communication to a total of 55 municipalities.

Entity

Nestlé España (Nespresso Division) in collaboration with Valencia City Council, Consorcio Valencia Interior, The Valencian Regional Government, COAALI (Bel, JDE, Codorníu, Hydro, Cofresco) and Vaersa.

Nayara Fuentes (nayara.fuentes@nespresso.com).

More information: www.nespresso.com

Sector

CE Principles

1 7

Key Results

Emissions
Waste

Cost savings
Revenue potential
Innovation

Knowledge
Awareness
Cooperation
Sustainable development

SDG commitments

12 13 17

Difficulties or challenges

- Harmonisation of legislation.
- Complex process to circulate it.
- Access to finance.
- High initial investments.

Pilot

Melilla Second Life: second life batteries for energy storage

Autonomous City of Melilla

Local

Scope and significance of BPGEs in the CE

Circularity in production processes.

Measures that encourage the re-use of a product that is still in good condition and fulfils its original function (and is not a waste) for the same purpose for which it was conceived.

Objectives

1. To gain experience in designing plants for stationary applications, using batteries from electric vehicles, whose first life has come to an end. Moreover, operational experience will be gained, which will be useful for establishing which applications are more favourable and make sense in a model of circularity and sustainability in the future.
2. To develop technical standards for selecting second life batteries (define test protocols and minimum KPI values for acceptance).
3. To make available battery data during system operation in Melilla and to develop a degradation model. To identify and promote the adoption of technical characteristics/standards that are suitable for application to second life batteries.
4. To provide the City of Melilla with an Energy Storage System that will significantly improve the quality of its supply.

Description

The Second Life project, undertaken by Endesa in collaboration with Nissan, uses batteries from electric vehicles that have ended their primary use for assembly into a large, fast-response stationary storage system that accumulates energy. This system is integrated with the Melilla thermal generation plant currently in operation, such that if there is any failure at the power plant, the storage system is capable of generating electricity, thus preventing power cuts. The solution is based on reusing more than ninety interconnected batteries with rated power control electronics capable of providing up to 4 MW, with a maximum cumulative energy of 1.7 MWh. This project is the first large-scale experience of reusing second-life batteries in Spain and a unique initiative in the EU.

Entity

Endesa Generación S.A.(Endesa Group) in collaboration with Nissan.

Virginia Ocio de la Fuente (sostenibilidad@endesa.es).

Sector D

CE Principles

1 2 3 5 6 7

Key Results

Materials
Emissions
Energy
Waste

Cost savings
Innovation

Knowledge
Sustainable development

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Cooperation with the authorities.
- Insufficient demand.
- Others: The difficulties have concerned coordination in an innovation project in which many companies are involved and the objective is to develop system integrated into an existing plant. However, an unexpected challenge has been to continue with the project with the situation created by the emergence of COVID-19.

More information:

Explanatory video: https://www.youtube.com/watch?v=bEG90IzAewY

Press release: https://www.endesa.com/es/prensa/sala-de-prensa/noticias/eficiencia-energetica/economia-circular/puesta-en-marcha-central-almacenamiento-baterias-coches-electricos-melilla#:~:t

Pilot

New process for mechanical recycling of mixtures of plastics from the residual waste fraction

Alhendín, Granada, Andalusia

European Union

Scope and significance of BPGEs in the CE

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To reduce landfilled and incinerated plastic waste by 5,600 tonnes/year (13 % of total plastic waste in RWF) by recovering and recycling of PLASTIC MIX, in particular polypropylene (PP), polystyrene (PS) and expanded polystyrene (EPS), a waste fraction that is currently neither recovered nor recycled.
2. To revalorise the 3,769 tonnes/year of recycled PP, PS and EPS waste from the residual fraction, including 80 % recovered PP, PS and EPS into new products, supporting the new circular economy of plastics.
3. To reduce the carbon footprint and CO2 emissions of the plastics industry by 68.9 % when comparing the use of recycled plastic with virgin materials.

Description

As part of Life Plasmix, a sorting and mechanical recycling line for post-consumer plastic waste will be set up. The separation and sorting of waste will be done automatically with optical separators. Subsequently, the sorted materials will be shredded and passed through a washing, extrusion and pelletising line to obtain a pellet that will be used as raw material to manufacture prototypes. Specifically, the recycled material (PP) is intended to be used in the automotive sector for the manufacture of car headlight housings and in the food sector, using recycled PP and PS to manufacture packaging that may come into contact with food and which complies with health and hygiene regulations*.

**This is a pilot project and approval for its use in food packaging is still pending. Currently, only r-PET is approved for food use by the European Food Safety Authority (EFSA).*

Sector

CE Principles

Key Results

Energy
Waste
Water

Cost savings
Productivity
Revenue potential
Innovation

Knowledge
Awareness Equality
Welfare
Sustainable development

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Cooperation with the authorities.
- Complex process to circulate it.
- Useful applications of recycled materials.
- Quality problems.
- Price volatility.

Entity

FCC Medio Ambiente, S.A.U. in collaboration with ANAIP, ANDALTEC, Lindner Was- htech (Germany), Pellenc Selective Technologies (France), Standle Selec-ciona and University of Granada.
Olivier Malet (omalet@fcc.es).

More information: www.fccma.es

Pilot

Sustainable management of used face masks

Valladolid, Castille Leon

European Union

Scope and significance of BPCEs in the CE

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. Mechanically to separate of a waste with a high microbiological load and great environmental impact (used face masks) in the WTCs, preventing its being deposited in landfill.
2. To obtain by pyrolysis of the masks, a propylene-rich gas and an oil suitable for use in fermentation with microorganisms.
3. To produce citric acid (acid used in the cosmetic, pharmaceutical and food industry) and PHB (biopolymer, used for the production of masks and syringes) by fermenting the oil from the pyrolysis of masks.

Description

The project's main objective is to prevent COVID-19 masks from ending up in landfills. To achieve this objective, a sustainable management system is proposed that includes a process of mechanical separation of the used masks that are processed in the Waste Treatment Centres (WTC) and a subsequent revalorisation through pyrolysis and bioconversion of the resulting oils, obtaining citric acid and PHB (polyhydroxybutyrate).

Entity

FCC Medio Ambiente, S.A.U. en colaboración el Centro Técnologico CARTIF.

Olivier Malet (omalet@fcc.es).

More information: www.fccma.es

Sector

CE Principles

Key Results

Energy
Waste
Water

Cost savings
Productivity
Revenue potential
Innovation

Knowledge
Awareness
Equality
Welfare
Sustainable development

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Cooperation with the authorities.
- Complex process to circulate it.
- Recognition of by-products/secondary raw materials.
- Useful applications of recycled materials.
- Quality problems.
- Price volatility.

Pilot

Circular economy project in residential construction

Madrid, Community of Madrid

Regional

Scope and significance of BPCEs in the CE

Measures to promote the recovery of secondary raw materials (SRM) and critical raw materials (CRM).

Objectives

1. To obtain real data about the footprint of construction and demolition waste in different types of residential buildings.
2. To help the sector in its transition to the circular economy by providing knowledge of the waste generated.
3. To raise awareness of waste management on construction sites.

Description

The action is based on obtaining a carbon footprint for construction and demolition waste during the construction of residential buildings, to serve as a reference for constructing other similar buildings. Currently, waste management studies included in projects differ from the actual waste data obtained during the building process, in terms of both the quantity of waste generated and the cost to the waste holder. Thus, it is necessary to bring the figures closer to reality and, to do so, we will analyse two property Developments undertaken by the company Vía Ágora, which have unusual characteristics in terms of their construction, location and waste management.

Entity

Gómez Pintado Foundation in collaboration with the Polytechnic University of Madrid.

More information: www.fundaciongomez-pintado.com

Sector K

CE Principles

1 2 3 7

Key Results

- Materials
- Emissions
- Energy
- Waste

- Competitiveness
- Potential revenue
- Expansion
- Innovation

- Knowledge
- Awareness
- Sustainable Development

SDG commitments

Difficulties or challenges

- Access to information.
- Administrative burden.
- Lack of circular regulation.
- Behavioural change/lack of awareness or cooperation.
- Complex process to circulate it.
- Recognition of by-products/secondary raw materials.
- Lack of circular infrastructure/technical or logistical barriers.
- Access to finance.

Pilot

RecyclableBlade: recyclable blade for wind turbines

Aalborg (Denmark). Currently, the same practice is beginning to be developed for onshore wind in Navarre (Spain).

International

Scope and significance of BPCEs in the CE

Waste prevention design: it should be easier to reuse, repair, upgrade and re-manufacture them, increase their readiness for recycling and to make it easier to recover secondary raw materials (including the dismantling of the different materials contained in those products) and recyclability rate or high-quality composting.

Processes that reduce their environmental footprint and are related to the transition to a CE.

Objectives

1. To demonstrate the recyclability and circularity of wind turbine blades.
2. Significantly to minimise the generation of waste from the wind industry.
3. To allow cascading of materials used in wind turbine blades.

Description

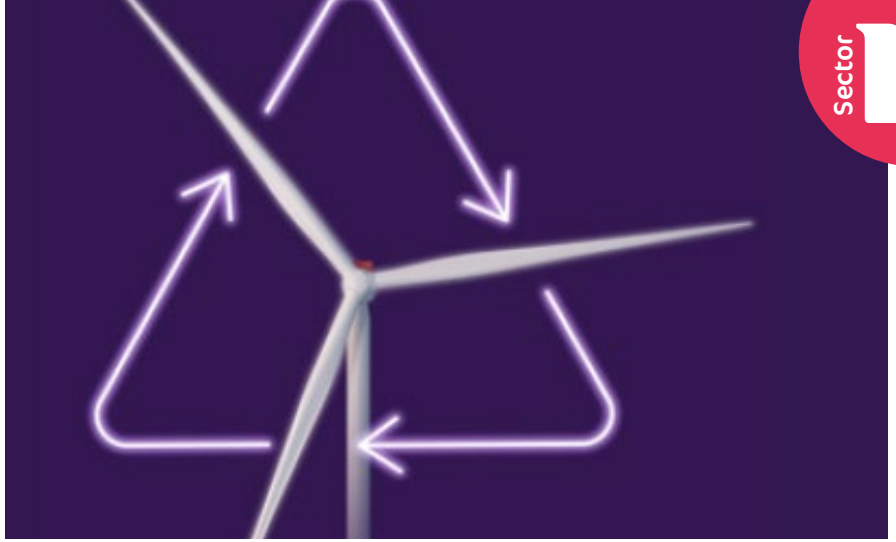
The project is based on designing and developing fully-integrated wind turbine blades recyclable. Siemens Gamesa's RecyclableBlade uses a new resin system that dissolves easily under moderate conditions at the end of its service life, ensuring the full recyclability of all wind turbine blade materials.

Entity

Siemens Gamesa Renewable Energy, S.A. in collaboration with Aditya Birla Chemicals.

More information: www.siemensgamesa.com

https://www.youtube.com/watch?v=-AVqdYIn_og



Sector

CE Principles

1 7

Key Results

Emissions

Competitiveness
Innovation

Knowledge
Cooperation
Sustainable development

SDG commitments

Difficulties or challenges

- Absence of legal standards and definitions.
- Lack of circular regulation.
- Complex process to circulate it.
- Price volatility.

Pilot

Use of cork waste for tree surrounds and playground pavement

Palafrugell, Gerona, Catalonia

Regional

Scope and significance of BPCEs in the CE

Measures to promote the recovery of secondary raw materials (SRM) and critical raw materials (CRM).

Objectives

1. Obtaining, testing and demonstration of tree surrounds and playground pavements eco-designed with cork from recycled cork stoppers.

Description

The project consists of obtaining, testing and demonstrating tree surrounds and playground pavements eco-designed from recycled cork stopper waste, which will reduce the environmental impact and improve the performance of the tree surrounds currently on the market. These tree surrounds will be made of recycled cork stoppers replacing non-renewable raw materials (gravel and metals) and, at the same time, they should be recyclable.

Entity

Fundació Institut Català del Suro in collaboration with Agència de Residus de Catalunya.

Albert Hereu (icsuro@icsuro.com).

More information: www.icsuro.com

Sector

CE Principles

3 6 7

Key Results

Emissions
Energy
Waste

Innovation

Knowledge
Well-being
Sustainable development

SDG commitments

Difficulties or challenges

- Behavioural change/lack of awareness or cooperation.
- Complex process to circulate it.
- Lack of circular infrastructure/technical or logistical barriers.
- Organisational structures.

Pilot

Exfoliating applications of cork by-products in cosmetics

Palafrugell, Gerona, Catalonia

National

Scope and significance of BPGEs in the CE

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. Identify the potential for exfoliating applications of micro granulated cork residues in cosmetic formulations.

Description

The company QUIMIVITA wants to develop the foundation a natural exfoliant, based on granulated cork waste, hence the waste generated in the companies participating in the project is being studied and those that are not suitable for manufacturing cork but which can be used for other purposes are being identified. These products include 0.5-1 mm micro-pellets as a facial scrub ingredient and 1-2 mm micro-pellets as a body scrub ingredient. This provides a commercial outlet for a low-value product and increases circularity, which will improve the sector's competitiveness by generating knowledge to boost relations with the wine sector.*

**This is an experimental project in the Development phase and therefore does not imply legal recognition of the end of waste or by-product status, as set out in Law 7/2022, of 8th April· waste and contaminated soil for a circular economy.*

Entity

Fundació Institut Català del Suro in collaboration with CDTI, Quimivita SL, CICYTEX, CRAC, Francisco Oller, S.A.

Albert Hereu (icsuro@icsuro.com).

More information: www.icsuro.com

Sector

CE Principles

2 3 5 7

Key Results

Materials
Waste

Potential revenue
Expansion
Innovation

Employment
Knowledge
Awareness
Welfare
Sustainable development

SDG commitments

9 12 13

Difficulties or challenges

- Administrative burden.
- Complex process to circulate it.
- Recognition of by-products/secondary raw materials
- Useful applications of recycled materials.
- Lack of circular infrastructure/technical or logistical barriers.
- High initial investments.

Pilot

LEVEL-UP: extending the life of obsolete heavy industrial equipment

Galicia, Basque Country, Portugal and other EU countries European Union

Scope and significance of BPCEs in the CE

A wareness measures, where the product is understood to be a service, producers retain ownership of the product or responsibility for its performance throughout its life cycle.

Repair/restoration measures: repair and maintenance of the defective or old product (consumer good) so that it can be used for its original function (maintaining the quality level).

Waste prevention design: it should be easier to reuse, repair, upgrade and re-manufacture them, increase their readiness for recycling and to make it easier to recover secondary raw materials (including the dismantling of the different materials contained in those products) and recyclability rate or high-quality composting.

Objectives

1. To increase the useful life of obsolete heavy industrial machinery and equipment by implementing different digital technologies that monitor the real state of the machine, offering predictive maintenance for them and the repair or remanufacture of their components.
2. To encourage the adoption of circular business models such as servitisation by original equipment manufacturers, in this case of heavy industrial equipment, maximising its useful life and economic value in the market.
3. To generate new digital and circular jobs in repair, remanufacturing and functional upgrading of industrial equipment.

Description

The LEVEL-UP project consists of developing a digital system that offers different technological products and services for the reconditioning, upgrading and improvement of functionalities and operability, maintenance, repair and remanufacturing of obsolete machinery or heavy industrial equipment, so as to maximise their useful life and economic value, and maintaining the technical, environmental and economic competitiveness in the customers' market.

Entity

AIMEN Centro de Aplicaciones Láser in collaboration with FAGOR, DANOBAT, IDEKO (Spain), INEGI, SO-FIES TOSHULIN and TRIMEK.

Edurne Suárez Lejardi (edurne.suarez@aimen.es).

Sector

CE Principles

4 5 6

Key Results

Materials
Emissions
Energy
Waste

Cost savings
Productivity
Competitiveness
Potential revenues
Expansion
Innovation

Employment
Knowledge
Awareness
Cooperation
Sustainable development

SDG commitments

8 TRABAJO DECENTE Y CRECIMIENTO ECONÓMICO
9 INDUSTRIA, INNOVACIÓN E INFRAESTRUCTURA
12 PRODUCCIÓN Y CONSUMO RESPONSABLES

Difficulties or challenges

- Absence of legal standards and definitions.
- Lack of circular regulation.
- Behavioural change/lack of awareness or cooperation.
- High initial investments
- Others: Lack of awareness and knowledge on the part of the manufacturing industry about circular economy actions or principles.

More information: http://www.levelup-project.eu/

https://www.aimen.es/

Circular protocols: http://www.levelup-project.eu/project/circularity_protocols

Pilot

MANDALA project: thermo-reversible adhesive for plastics

Zaragoza, Aragon

European Union

Scope and significance of BPGEs in the CE

Waste prevention design: it should be easier to reuse, repair, upgrade and re-manufacture them, increase their readiness for recycling and to make it easier to recover secondary raw materials (including the dismantling of the different materials contained in those products) and recyclability rate or high-quality composting.

Replacement of materials from non-renewable sources by bio-based raw materials that are reusable, recyclable or compostable.

Measures for/to encourage recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To boost the reuse economy of plastics that decouples their production from fossil fuels.
2. To engage the entire value chain to develop a new, scalable and replicable recycling technology.
3. To minimise the material required to achieve barrier properties suitable for the food and pharmaceutical industry.

Description

Multilayer plastics are widely used because of their excellent mechanical and barrier properties. However, the adhesive that binds them together cannot be separated, which prevents them from being recycled. The MANDALA project has developed a thermo-reversible adhesive and a delaminating technology that will allow the layers to be separated.

This innovation is accompanied by an eco-design study. Minimising the thickness, number of layers and diversity of materials allows for more efficient use of resources. Relatedly, nanoparticles have been introduced into the adhesive to improve barrier properties and promote delamination.

Although this project prioritises keeping the material in the value chain, it also considers the material's biodegradability material. To ensure they are safe for the environment, their behaviour in a terrestrial, marine and industrial environment will be studied.

Sector

CE Principles

1 2 7

Key Results

Material
Emissions
Waste

Cost savings
Competitiveness

Employment
Sustainable development

SDG commitments

12 13 14

Difficulties or challenges

-Quality problems.

- High initial investments.

Entity

FOOD+i - Cluster of food companies in the Ebro Valley in collaboration with AITIIP, CSIC-ICTP, SAPICI, REPSOL, BIO-MI, NORNER, GAVIPLAS, CADEL DEINKING, CTIC-CITA, COSMETIC SP and LABORATORI ARCHA SRL.

María Díaz Navarro (mdiaz@clusterfoodmasi.es).

More information: https://www.clusterfoodmasi.es/

https://mandalaproject.eu/

Pilot

Sector

OLEAF4VALUE: experimental valorisation of olive leaves

Hervás, Cáceres, Extremadura

European Union

Scope and significance of BPCEs in the CE

Substitution of materials from non-renewable sources by bio-based raw materials that are reusable, recyclable or compostable.

Measures to encourage re-manufacturing: use waste or parts of waste in a new product (and as a new condition). Use of by-products and products with by-product declaration and/or end-of-waste declaration. Reprocessing of materials used in backfilling operations.

Objectives

1. To develop a sustainable solution to valorise of olive leaves, producing high added value bioproducts for multiple industries.
2. To reduce the environmental impacts resulting from current olive leaf management models (CO_2 emissions, soil degradation, olive tree diseases).
3. To create jobs in rural areas, helping to fix the population.
4. To introduce new products with high added value, thus contributing to the sustainability and circularity of multiple industries.

Description

OLEAF4VALUE is a three-year European project (H2020) to develop a system fully to enhance the utility of the olive leaf. The olive oil industry, which is of vital importance in the Mediterranean region, generates some 4.5 million tonnes of olive leaves per year. Managing this waste is a major problem for the industry. OLEAF4VALUE lays the foundation for an innovative value chain based on a new 4.0 concept: Smart Biorefinery and Multi-Route Valorisation Dynamics (SAMBIO: Smart Dynamic Multi-Valorisation-Route Biorefinery) for the cascade valorisation of olive leaves. Using advanced extraction and isolation techniques, OLEAF4VALUE will sequentially separate multiple high-value bioproducts in the food, feed, health, cosmetics, pharmaceutical and chemical industries. The OLEAF4VALUE consortium includes partners with extensive experience in all stages of the value chain: feedstock, biorefinery, post-extraction, market validation and sustainability analysis. *

**This is an experimental project currently in the development phase and therefore does not imply legal recognition of the end of waste or by-product status, as set out in Law 7/2022, of 8th April, waste and contaminated soils for a circular economy.*

OLEAF4VALUE

CE Principles

1 2 5

Key Results

Emissions
Waste
Biodiversity

Productivity
Competitiveness
Revenue potential
Innovation

Employment
Knowledge
Sustainable development

SDG commitments

Difficulties or challenges

- Complex process to circulate it.
- Lack of circular infrastructure/technical or logistical barriers.
- Time-consuming processes.
- Access to finance.
- High initial investments.
- Low return on investment.

Entity

Natac Biotech S.L.

More information: https://natacgroup.com/es/

https://oleaf4value.eu/

Pilot

Sector

Si-Recycle: Recycling and valorisation of silicon solar panels

The industrial plant is planned to be sited at Albalate del Arzobispo (Teruel)

European Union

Scope and significance of BPCEs in the CE

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To implement the circular economy in the renewable energy sector, in particular in the solar energy sector.
2. To reduce demand for raw materials from other countries.
3. To foster the availability of raw materials for the production of new solar panels on European territory to boost energy independence.
4. To contribute to a green energy transition.
5. To reduce the energy sector's emissions footprint.

Description

The European Photovoltaic Recycling Centre (CERFO), through its Si-Recycle project, is undertaking an exhaustive research process in coordination with the CIRCE Technology Centre and an American laboratory to establish the best technology to recycle silicon solar modules. Once the most appropriate treatment is established to maximise recovery of the materials, the model will be scaled up industrially in the Cuencas Mineras region (Teruel), a place that has suffered a significant loss of employment and population in recent years due to the closure of thermal power plants. Thus, the project fulfils two premises that are fundamental within the developer: social sustainability and environmental sustainability.

Entity

Centro Europeo de Reciclaje Fotovoltaico S.L. (CERFO) in collaboration with Fundación CIRCE (Centro de Investigación de Recursos y Consumos Energéticos).

More information: www.cerfo.net

CE Principles

5 6 7

Key Results

Materials
Waste

Cost savings
Competitiveness
Innovation

Employment
Welfare
Sustainable development

SDG commitments

7 9 12

Difficulties or challenges

- Quantity problems.
- High initial investments.

Pilot

Coffee Grounds Shoes: circular economy applied to footwear

Arnedo, La Rioja

Local/Regional

Scope and significance of BPCEs in the CE

Design and manufacture of re-manufactured products, materials from the recycling of other products, by-products or secondary raw materials, while ensuring their performance and safety.

Objectives

1. Main objective: to acquire new knowledge about coffee residues to be used to develop new additives with antimicrobial and aromatic properties to improve the various components of footwear.

2. Specific objectives: to close the life cycle of the initial waste and, indirectly, due to the immediate launch of the new product on the market, the manufacturer will benefit from an improved image as perceived by its customers, maintaining its position as a cutting-edge brand committed to eco-innovation with a recognised position in the eco footwear market due to the new high added value qualities.

Description

• Identification of coffee suppliers/roasters to ensure the project features characteristics of a circular economy.

• Collection of SCG (Spent Coffee Grounds), residual coffee beans, from five varieties.

• Assessment of antibacterial activity against S. aureus ATCC 6538 and K. pneumoniae ATCC 4352 in granulated solid coffee (dilutions 10,50,100 mg/ml. with ISO 16187 methodology for antibacterial assays in footwear).

• Study of binder materials to establish whether their properties allow them to be mixed with dregs: rubber and PVC (soles), compact PUR and EVA (midsoles).

• Characterisation of physical properties and validation of results regarding antibacterial activity against the two aforementioned bacteria.

• Prototyping, physical-mechanical testing and LCA, Life Cycle Analysis, of the new sustainable product.

Sector S

CE Principles

1 2 3 5 7

Key Results

Materials
Emissions
Waste

Cost savings
Competitiveness
Revenue potential
Innovation

Knowledge
Sustainable development

SDG commitments

Difficulties or challenges

- Useful applications of recycled materials.

Entity

Footwear Technology Centre of La Rioja.

Leyre Sola Aznar (lsola@ctcr.es).

More information: www.ctcr.es

Natural Worl Eco (Gromo World, S.L.)

Pilot

Alliance for the collection and recycling of used coffee capsules

Throughout Spain

National

Scope and significance of BPGEs in the CE

Measures to improve waste collection and separation.

Measures for/encouraging recycling: recovering materials from waste for reprocessing into new products, materials or substances, either for the original purpose or for other purposes. It includes reprocessing of organic material but not energy recovery.

Objectives

1. To have a single recycling system for coffee, aluminium and plastic capsules, which will guarantee a comprehensive solution for the sector.
2. To expand the management of the current system by expanding collection points, to encourage the recycling of coffee pods, providing consumers with better and wider access to the system, both locally and nationally.
3. To offer a sustainable and circular response to managing coffee capsules as waste.
4. To promote awareness of the coffee capsule collection and recycling system among consumers..

Description

ARECAFÉ is a non-profit organisation founded to create, develop and manage an ambitious nationwide collective collection and recycling system for used coffee capsules, both plastic and aluminium.

Under the umbrella of the Spanish Coffee Association (AECafé), 24 companies -AB Café - Sevi- llana de Café, BOU café, Café Arabo, Café Dromedario, Café Fortaleza, Café Jurado, Café Rico, Cafento, Cafés Baqué, Cafés Batalla, Cafés BO, Cafés Guilis, Cafés La Brasileña, Cafés Orús, Cafés Toscaf, Coffee Productions SL, Expressate, Fast Eurocafé (Cafés Oquendo), General Coffee Blenders, Global Coffee Industries, Grupo UCC, Jacobs Douwe Egberts (JDE), Nestlé España, Productos Solubles (PROSOL) - have joined this initiative to promote a single recycling system for coffee capsules, aluminium and plastic, which will guarantee a comprehensive solution for the sector. The companies use, as a basis, the recycling system that Nestlé, through the Nescafé Dolce Gusto and Nespresso brands, which was launched in Spain in 2010.

Sector S

CE Principles

1 6 7

Key Results

Waste
Other

Knowledge
Cooperation
Sustainable development

SDG commitments

Difficulties or challenges

- Behavioural change/lack of awareness or cooperation.
- Lack of circular infrastructure/technical or logistical barriers.
- Organisational structures.

Entity

ARECAFÉ in collaboration with AB Café - Sevillana de Café, BOU café, Café Arabo, Café Dromedario, Café Fortaleza, Café Jurado, Café Rico, Cafento, Cafés Baqué, Cafés Batalla, Cafés BO, Cafés Guilis, Cafés La Brasileña, Cafés Orús, Cafés Toscaf, Coffee Productions SL, Expressate, Fast Eurocafé (Cafés Oquendo), Gene- ral Coffee Blenders, Global Coffee Industries, Grupo UCC, Jacobs Douwe Egberts (JDE), Nestlé España, Productos Solubles (PROSOL).

More information: www.lascapsulasserecicIan.com

Pilot

Study of the contribution of technical standards to the circular economy

Madrid, Community of Madrid

National

Scope and significance of BPCEs in the CE

Voluntary certifications, eco-labels and Environmental Product Declarations (EPD) focused on LCA, eco-design or energy efficiency, thus allowing consumers to take responsibility in the circular transition.

Using the EU Ecolabel, the EU Energy Label or eco-design or Sustainable Forest Management certifications, among others.

Objectives

1. To make it easier to implement circular economy measures in different areas for a multitude of products, services and sectors by identifying existing technical standards that can be used to implement and validate such circular measures by both companies and regulators who are looking for existing references.
2. To encourage consideration of CE in standards, providing the standard-setting community with examples of how to do this integration.

Description

The study highlights more than 300 examples of technical standards that specifically support various aspects of the circular economy in a representative and non-exhaustive way. The aim is to identify practical tools that can be applied by several types of companies and organisations when determining or implementing circular economy measures. The standards included in the study address *inter alia*:

- Requirements for waste (or potential by-products) to be used in production processes.
- Assessment of the durability, recyclability, biodegradability and other aspects of the circularity of a multitude of products.
- Test methods and requirements to characterise recycled material.
- Identification of hazardous substances that may hinder the implementation of circular measures.
- Terminology.
- Waste reduction at source.
- Communication of environmental information including the circular dimension.
- Waste collection and treatment requirements.

Sector S

CE Principles

1 2 3 5 6 7

Key Results

Materials
Waste

Cost savings
Productivity
Competitiveness

Awareness
Sustainable development

SDG commitments

9 12

Difficulties or challenges

- Lack of implementation.
- Others: Lack of knowledge of the existence of practical and recognised guidelines to implement circular measures slows progress towards this model. Where technical standards exist in the areas where circular economy measures are to be implemented or promoted, promoting their application, as opposed to tackling design of new methodologies, accelerates progress and reduces the resources required to do so.

Entity

Spanish Standardisation Association - UNE in collaboration with the Secretariat of the standardisation committees responsible for the technical standards included. Iván Moya Alcón (info@une.org).

More information: https://www.une.org/

Research: https://www.une.org/normalizacion_documentos/Estudio%20de%20la%20contribuci%c3%b3n%20de%20las%20normas%20t%c3%a9cnicas%20a%20la%20econom%c3%ada%20circular.pdf

III Catalogue of Best Practices in Circular Economy (CBPCE)