



CENTER FOR
CIRCULAR ECONOMY
IN COFFEE



*Toward a Circular
Coffee Sector:
Highlights from
Year Two*

2025 Summary Booklet



Credits

Photography: Lavazza Group, C4CEC, UNIDO

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The Center for Circular Economy in Coffee is a global **precompetitive platform** for enhancing and **nurturing** the **circular economy principles** and **practices** within the coffee sector.





Officially launched on September 26, 2023
at ICO World Coffee Conference



“ If on the one hand tangible action by individual players is indispensable, it is only by joining forces with all the other players in the coffee industry that we can give a real boost to the circular transition. This Center represents a valuable precompetitive platform which has the potential to deliver lower impacts on environment and improve the income for coffee growers and other stakeholders: a very good reason for all the actors of the supply chain to join the group and actively participate.

Mario Cerutti, C4CEC Board chairman, Lavazza Foundation Secretary,
Lavazza Group Head of Institutional Relations & Sustainability





☰ Vision

The Center for Circular Economy in Coffee (C4CEC) aims to be a **reference actor** in the **transition towards a circular model** in the **coffee sector**, where the concept of waste no longer exist and new models of profitability are created.



From Linear

☰ Mission

The mission of the Center is to provide a platform that **accelerates the transition to a circular economy** in the coffee sector by fostering collaboration, sharing knowledge, and advocating for circular initiatives. The Center brings together local producer communities, roasters, associations, institutions, research centers, and academia **to drive collective action**.



To Circular



Founding members and Strategic partners



INTERNATIONAL
COFFEE
ORGANIZATION



Politecnico
di Torino



International
Trade
Centre



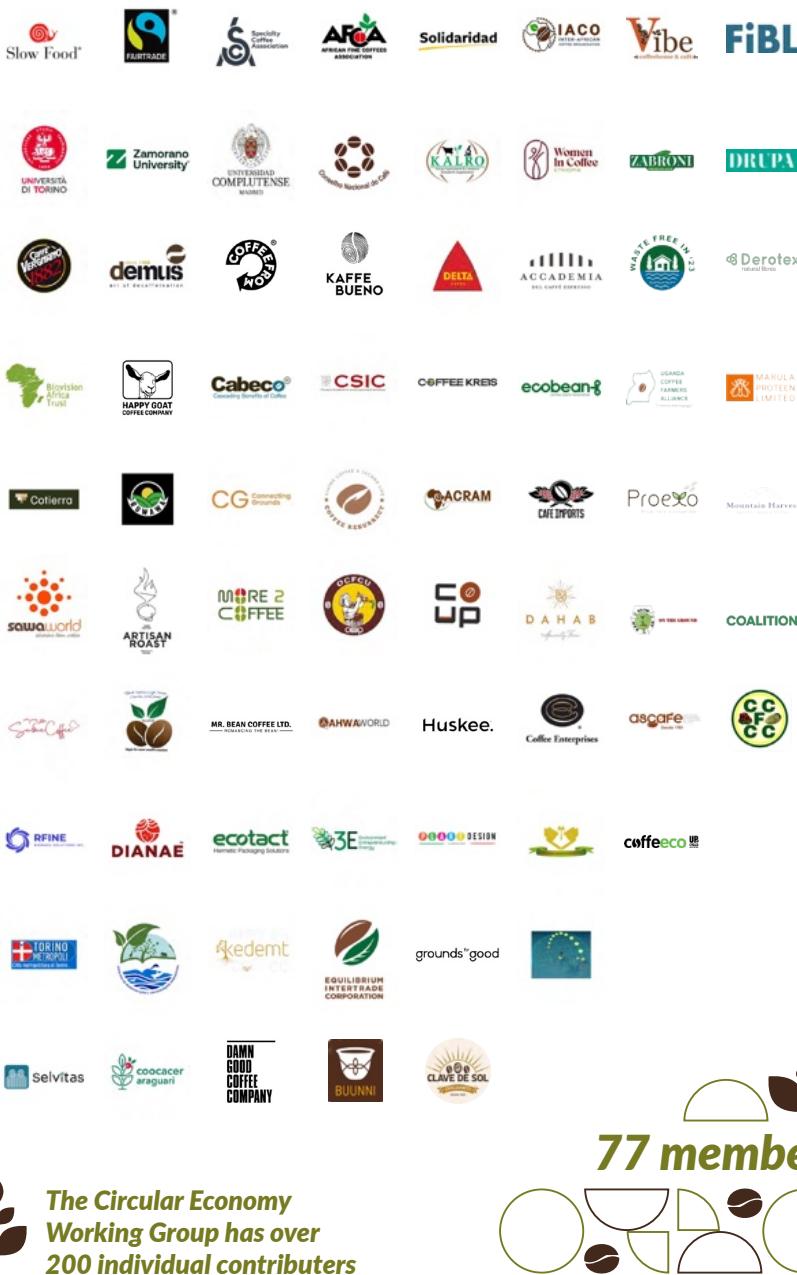
Università di Scienze
Gastronomiche di Pollenzo



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



The Members



**The Circular Economy
Working Group has over
200 individual contributors**

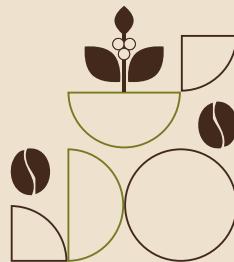
77 members



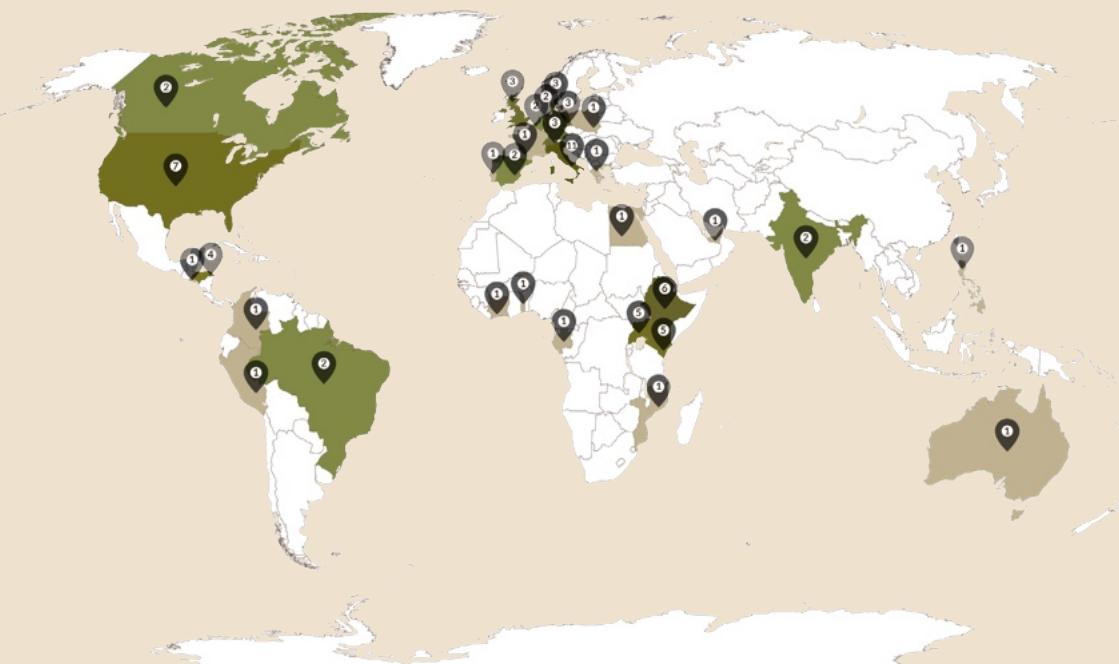
The C4CEC has grown into a robust network of **77** members + **3** strategic partners across **31** countries.

44% of members are from the Global South, with **41%** based in Europe and **12%** in North America.

60% of our members are SMEs, with NGOs and public & academic institutions each comprising around **20%**.



The C4CEC initiative is open to organizations and companies globally, while individuals can participate through ITC's Coffee Guide Network Circular Economy Working Group





Events on Circular Economy in which the C4CEC has actively participated, directly and through members and representatives

Feb, 24-30 »»» **AFCA & 6th Inter-African Coffee Organization's African Coffee Research Network Conference | Tanzania, East Africa**

Apr, 26 »»» **SCA EXPO | Houston, Texas, USA**

May, 13-16 »»» **World Circular Economy Forum | Brazil, South America**

Jun, 26-28 »»» **World of Coffee | Geneva, Switzerland**

Jul, 22-24 »»» **ITC Global SME Ministerial Meeting | South Africa**

Sep, 25 »»» **Let's Talk Coffee | Lima, Peru**

Sep, 26 »»» **International Forum on Industrial Biotechnology and Bioeconomy | Turin, Italy**

Nov, 10-11 »»» **COP 30 United Nations Climate Change Conference | Belém, Brazil**

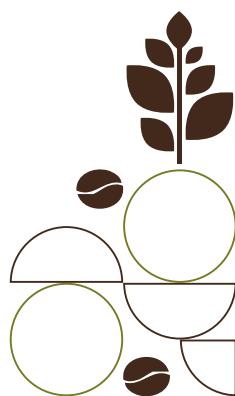
Nov, 20-21 »»» **VIII International Circular Economy Forum - Peru (FIEC 2025) | Lima, Peru**



A Circular Economy model for the coffee sector designs, balances, and implements **regenerative practices**, **resource efficiency**, and **waste reduction** while giving **value to process outputs**, achieving environmental, social and economic **sustainability**.

ITC Coffee Guide
Network Circular
Economy Working
Group, 2024

Driven by a **systemic and holistic approach**, it draws inspiration from the dynamics of **natural systems** to regenerate, maintain, and create **shared value** for all stakeholders, across different **contexts** and within the entire coffee value **circle**.





Why Circular Economy in Coffee Matters?

«««

1-5 %

*of the original
cherry remains in
our cup*



*The coffee cherry is
made up of elements
with unique bio-active
compounds that can be
used across industries
from cosmetics, food
products, agriculture
production, energy, to
bioplastics and more*



***Coffee reimagined:
redefining waste
and closing the
sustainability loop***



»»» AWARENESS & CULTURE FOR CIRCULARITY

Serve as the global hub for knowledge exchange and awareness for circular economy in the coffee sector

- Curate and disseminate evidence-based good practices validated by the Scientific Board;
- Build and foster a multi-stakeholder global network for dialogue and collaboration;
- Share insights through publications, webinars, and events to foster a culture of circularity across the coffee sector;
- Connect coffee value chain actors with circular economy innovators to spark partnerships and scale solutions;
- Promote advocacy and thought leadership to influence sector-wide adoption.

»»» RESEARCH & CAPACITY BUILDING FOR SYSTEMIC CHANGE

Generate actionable evidence and strengthen capabilities to enable circular practices for circular economy in the coffee sector

- Consolidate emerging research and translate it into practical innovations;
- Produce technical guides, policy briefs, and white papers;
- Develop research-backed training materials and courses;
- Partner with associations and members to build capacity, especially for SMEs and producer organizations in coffee-growing countries;
- Facilitate knowledge transfer between research institutions and industry actors" – this emphasizes bridging the gap between theory and practice.

»»» TURN KNOWLEDGE INTO ACTION FOR SCALABLE CIRCULAR IMPACT

Drive real-world implementation of circular solutions through pilots, innovation testing, and collaborative projects

- Implement donor-funded and public-private partnership projects;
- Establish demonstration plots and proof-of-concept pilots for scalable circular economy solutions;
- Deliver trainings and Train-the-Trainer (ToT) programs;
- Test and validate circular innovations for scalability and market integration;
- Support members with technical assistance, market linkages, and financing opportunities to strengthen adoption of circular practices;
- Document and share learnings from pilots to inform sector-wide replication.





Four collaborative publications in two years

Resources



Beyond the Brew: The Hidden Potential of Spent Coffee Grounds



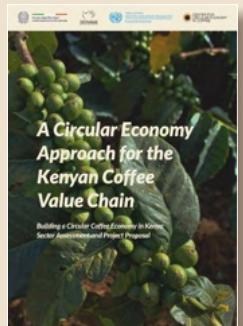
This white paper explores how spent coffee grounds (about 11 million tons of waste each year) can become a valuable resource for the circular bioeconomy. It reviews their composition and potential uses in agriculture, food, cosmetics, energy, and materials, noting that diverting them from landfill could cut emissions by up to 76%. The paper outlines business opportunities along with challenges such as fragmented collection, high moisture content, and inconsistent regulations. It also includes case studies, market insights, and impact estimates. The paper closes with recommendations for policy, financing, and partnerships to help build integrated processing systems and make SCGs a meaningful part of a circular coffee economy.



**Beyond coffee.
Towards a Circular
Coffee Economy**



**Making a case for a circular
economy in the coffee
sector**



**A Circular Economy
Approach for the
Kenyan Coffee
Value Chain**

Promoting Circular Economy Culture and Knowledge





Building a multi-stakeholder knowledge sharing network to develop and disseminate evidence-based good practices



average 160 participants for each event



Experts shared practical examples of circular economy work across the coffee value chain. They showed how these approaches spark innovation, improve business performance, and create opportunities for small and medium enterprises. They also outlined key challenges and what's needed to scale the work.

Global webinar series



Webinar 1:

Biochar as a Circular Practice in Coffee

Webinar 2:

Toward Circularity in Coffee Packaging

Webinar 3:

Circular Innovations with Spent Coffee Grounds

Webinar 4:

Driving Innovation: Research-Powered Solutions Towards Coffee Circularity

Regional Webinar Series

Circular Economy in Africa: Innovations Creating New Value from Coffee Waste



1. Co-hosted with AFCA under the Enable Program;
2. Co-hosted with ACRAM under the ACP Business Friendly Program;
3. Supporting Research and Training on Coffee Byproduct Valorization, co-hosted with ACRAM with African coffee sector institutions.



(Re)Generating Value through Circular Economy in Coffee

Presented by:

ITC, ICO, and C4CEC

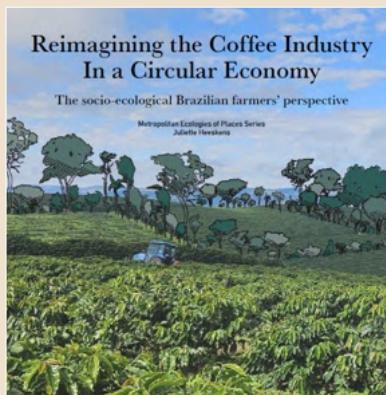


Promoting Circular Economy Culture and Knowledge





Supervised and developed multiple bachelor's and master's theses in partnership with TU Delft, Politecnico di Torino, and the University of Gastronomic Sciences of Pollenzo



**Reimagining
the Coffee
Industry in
a Circular
Economy**

*by Juliette Heeskens
TUDelft*

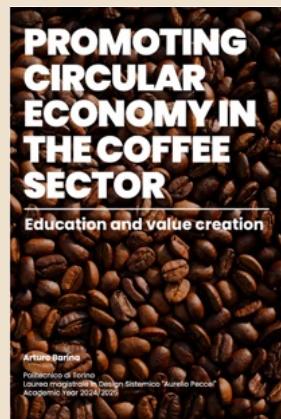


**On a Quest for a
Sustainable Cup of
Coffee**

*by Fabrizio Cavallo
UNISG*

**Promoting Circular
Economy in the
Coffee Sector**

*by Arturo Barina
PoliT*

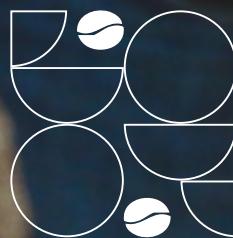


**Promote Circular Economy Culture and
Knowledge with the Next Generation**



A close-up photograph of a person's hands holding five coffee cherries of different colors (orange, yellow, yellow, yellow, green) in a lush green field. The person is wearing a blue and white striped shirt.

*Each coffee plant
can tell a story of
circularity, innovation,
and collaboration*





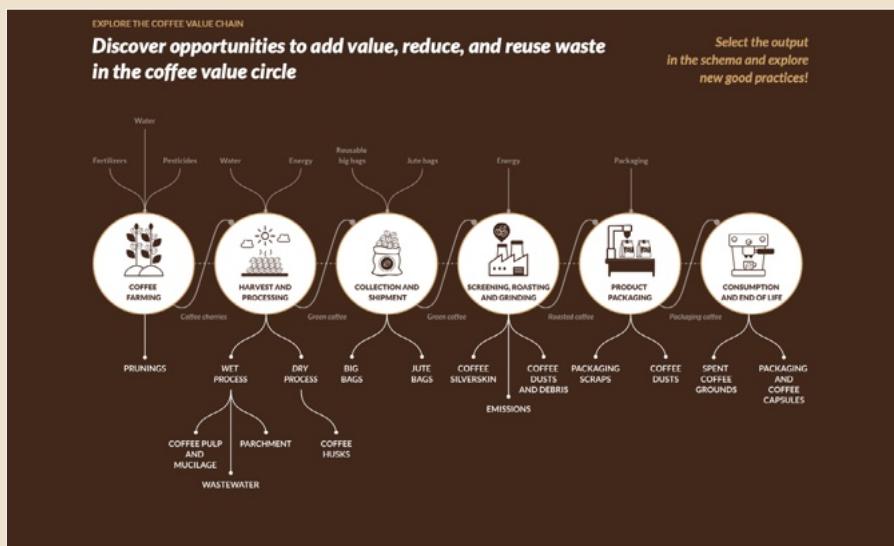
Building a multi-stakeholder knowledge sharing network to develop and disseminate evidence-based good practices



30 Good practices

This initiative to map existing best practices in the coffee supply chain is an ever-evolving resource designed to highlight and promote sustainable and circular approaches, in the coffee sector.

Interactive good practices map



Or select the tags of your interest and discover the good practices of circular economy in the coffee value chain



BIOCOPPOSITE MATERIALS: ADVANCING SUSTAINABLE MANUFACTURING

Collect and Share Good Practices



Data Behind Coffee Pulp



39-43%

of the coffee cherry's **total weight** is coffee pulp, indicating that nearly half of the fruit becomes this by-product during wet processing.

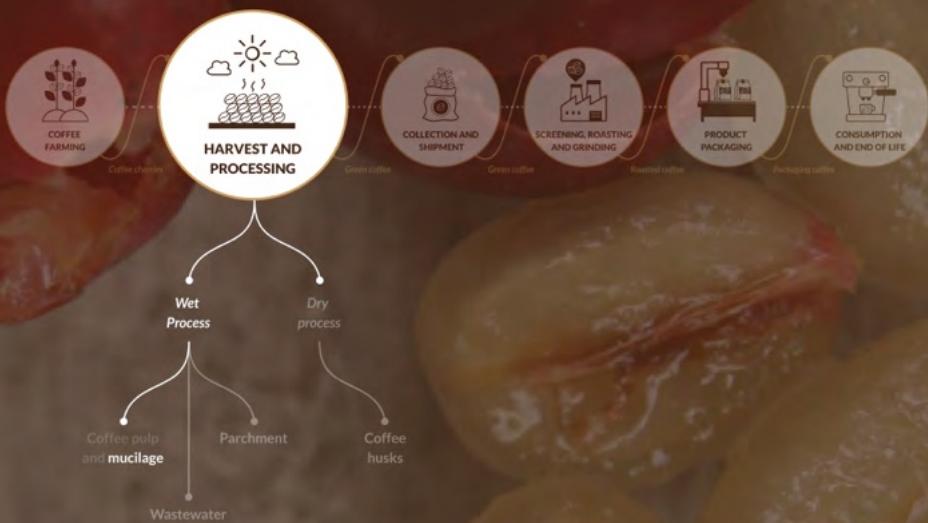


21-32%

coffee pulp's **composition** is carbohydrates, making it rich in energy-dense organic matter with potential uses in food, agriculture, and bio-products.



Data Behind Coffee Mucilage



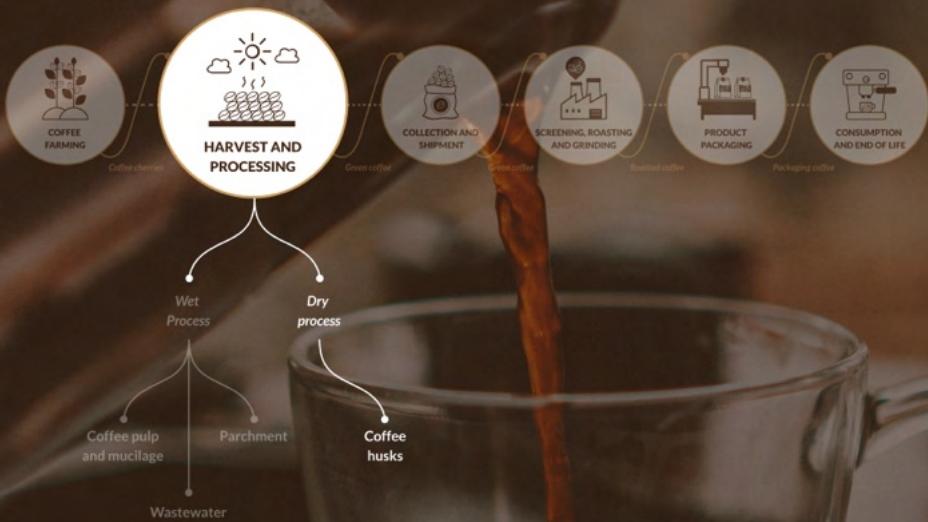
15% - 22%
of the weight of ripe fruit
is coffee mucilage.



0.4mm
is the thickness
of the mucus
layer that covers
the coffee beans.



Data Behind Coffee Husk



45%

of the coffee cherry

is made up of coffee husk, distinct from parchment as it includes skin and pulp from natural processing; it is also used as cascara, a fruity coffee-cherry beverage.

43%

cellulose makes coffee husks particularly rich in fibre, with additional components such as hemicellulose, lignin, minerals, and bioactive compounds.



Data Behind Coffee Silverskin



1.7%

of the green coffee bean

becomes coffee silverskin during roasting, a thin, papery by-product that requires careful handling due to its flammability.



30%

of coffee silverskin

is composed of cellulose and hemicellulose, giving this roasting by-product its characteristic fibrous and brittle structure.

Data Behind Spent Coffee Grounds



11 million

tons of spent coffee grounds are generated annually, representing a significant portion of coffee waste with potential for circular bioeconomy applications.



20-25% lignin, 36% hemicellulose, and 8-15% cellulose make SCGs a fibrous, nutrient-rich by-product with broad applications in materials, food, and biomedical industries.



Research and project development



4 Partners



The study shows how Ethiopian women can lead the upcycling of coffee mucilage and spent grounds into viable products and businesses that strengthen local economies and support the environment. Commissioned by Women in Coffee in Ethiopia on behalf of ITC and the Spanish Cooperation Agency, the work focused on long-term systems building, gender dynamics, market opportunities, and investment needs. Using stakeholder interviews, scientific research, and data from the 2023/2024 harvest, the team assessed by-product volumes and identified practical paths for byproduct transformation. The study is now complete and proposes a set of pilot strategies to begin implementing circular economy models in Ethiopia.

Timeline & Milestone

Six months

April 1 - September 30, 2025

SCG and Mucilage Valorization: Assessment and Pilot Design

Milestone 1:

Workplan for the Assessment and Analytical Study on the Utilization of Coffee Waste for Resource Transformation, including stakeholder engagement, field visits, and research components.

Milestone 2:

Mid-term progress report summarizing research findings to date, along with plans for field research and stakeholder interviews.

Milestone 3:

Field research report on spent coffee grounds and mucilage utilization opportunities in Ethiopia.

Milestone 4:

Strategy for pilot schemes in Ethiopia, including identification of potential pilot sites and partners.



SCG and Mucilage Valorization: Assessment

Final Report

Authors

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Mariamawit Solomon Kassa

September, 2025

Pilot Project and Research





Editorials

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Coffee Is a Fruit: Why Cascara Is Key to a More Circular Coffee Industry

By Chloé Skye Weiser, [Editorial Policy](#) published on October 10, 2025



FRESH CUP

A CIRCULAR VISION FOR COFFEE IS AN OPPORTUNITY FOR THE GLOBAL SOUTH

COFFEE PRODUCTION CURRENTLY FACES CHALLENGES RELATED TO ENVIRONMENTAL SUSTAINABILITY AND PROFITABILITY. THE CENTER FOR CIRCULAR ECONOMY IN COFFEE (CCEC) AIMS TO DRIVE CHANGE

by Antonella Iaria Totaro

RENEWABLE MATTER#55 - 2025 Global South



09 Dec 2025 16:00



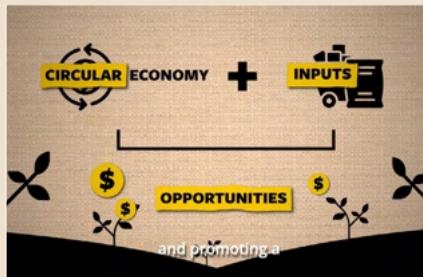
Renewable Matter



Food

ESGmakers

Center for Circular Economy in Coffee: the global platform for the circular economy in coffee



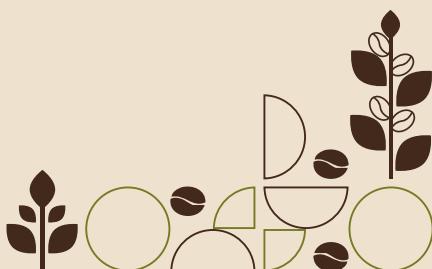
Solidaridad

Fostering Culture and Awareness for Circularity in Coffee



“ Our goal is to work with startups and farmers – especially in coffee-producing countries to create both economic and environmental impact. We encourage farms to reuse byproducts through financial incentives, strengthen their market connections, and enable delivery of these byproducts to other value chains. Ultimately, we aim to integrate coffee byproducts into alternative sectors such as cosmetics, turning waste into new opportunities.

Katherine Oglietti,
Coffee Guide Network Coordinator
at the International Trade Centre and
Co-coordinator of the C4CFC





www.circulareconomyincoffee.org