



*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



Politecnico
di Torino



Università di Scienze
Gastronomiche di Pollenzo



INTERNATIONAL
COFFEE
ORGANIZATION



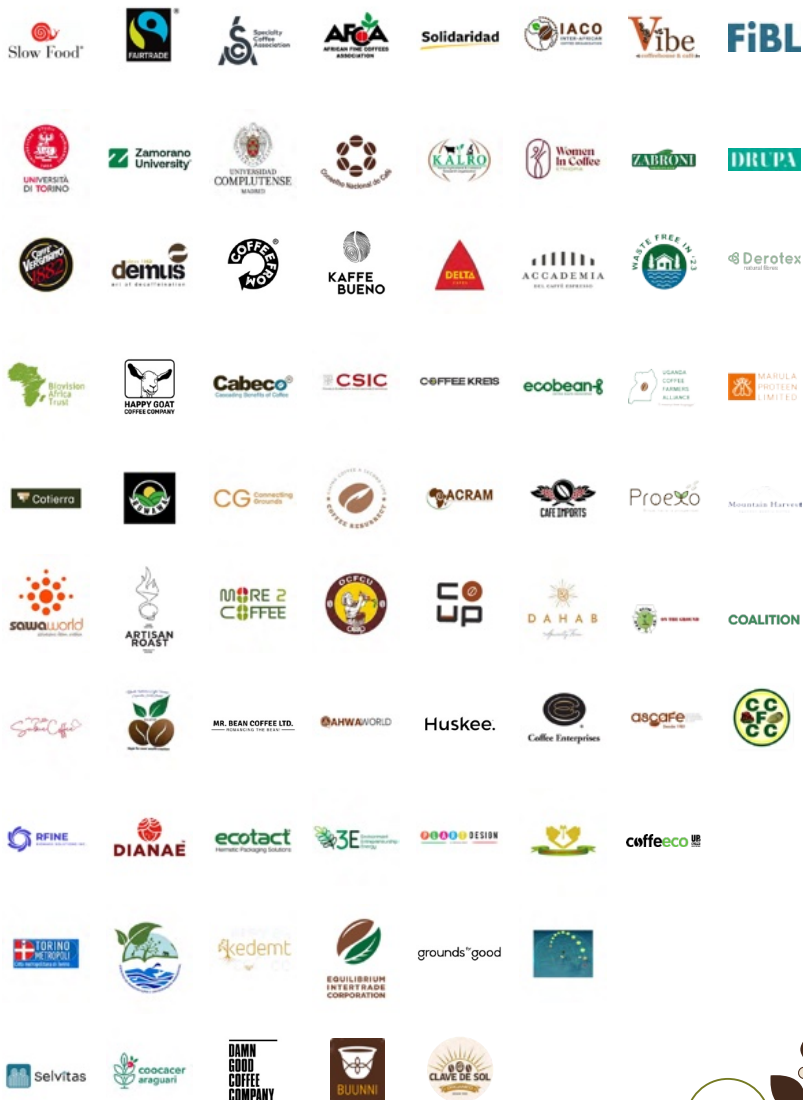
International
Trade
Centre



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



The Members

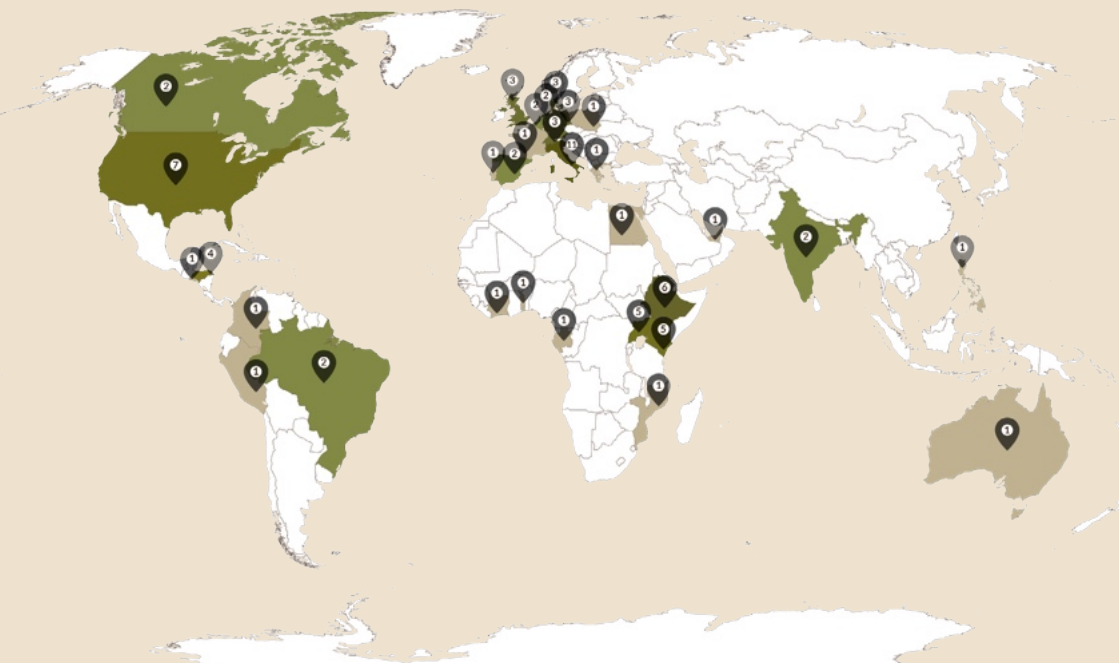


**The Circular Economy
Working Group has over
200 individual contributors**



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

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





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 |



**Promoting Circular Economy
Culture and Knowledge**

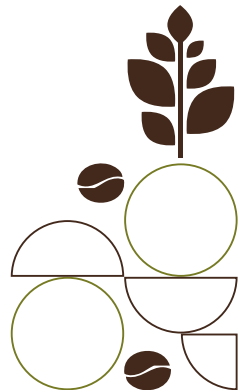


Definition of Circular Economy in Coffee

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



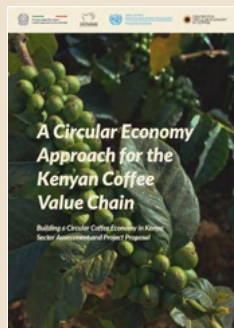
This white paper explores how spent coffee grounds (about 11 million tons of waste each year) can become a valuable resource for the circular bioeconomy. It reviews their composition and potential uses in agriculture, food, cosmetics, energy, and materials, noting that diverting them from landfill could 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



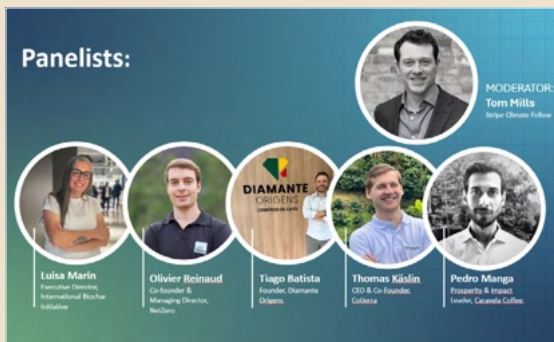
1. Co-hosted with AFCA under the Enable Program;
2. Co-hosted with ACRAM under the ACP Business Friendly Program;
3. Supporting Research and Training on Coffee Byproduct Valorization, co-hosted with ACRAM with African coffee sector institutions.



**(Re)Generating
Value through
Circular Economy
in Coffee**

Presented by:
ITC, ICO, and C4CEC

Panelists:



**Promoting Circular Economy
Culture and Knowledge**

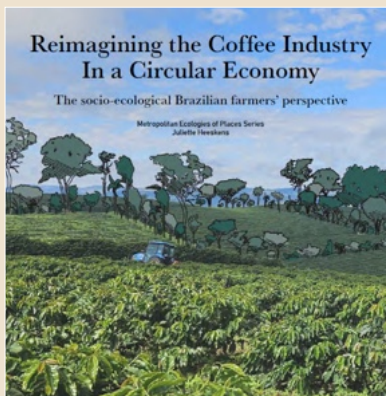




+ 3
thesis



***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
TU Delft

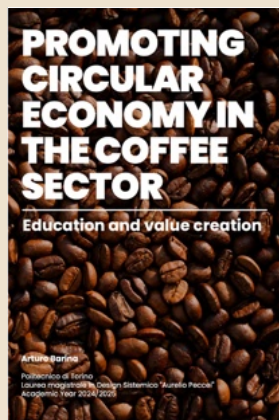


***On a Quest for a
Sustainable Cup of
Coffee***

by Fabrizio Cavallo
UNISG

***Promoting Circular
Economy in the
Coffee Sector***

by Arturo Barina
PoliTO



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



***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

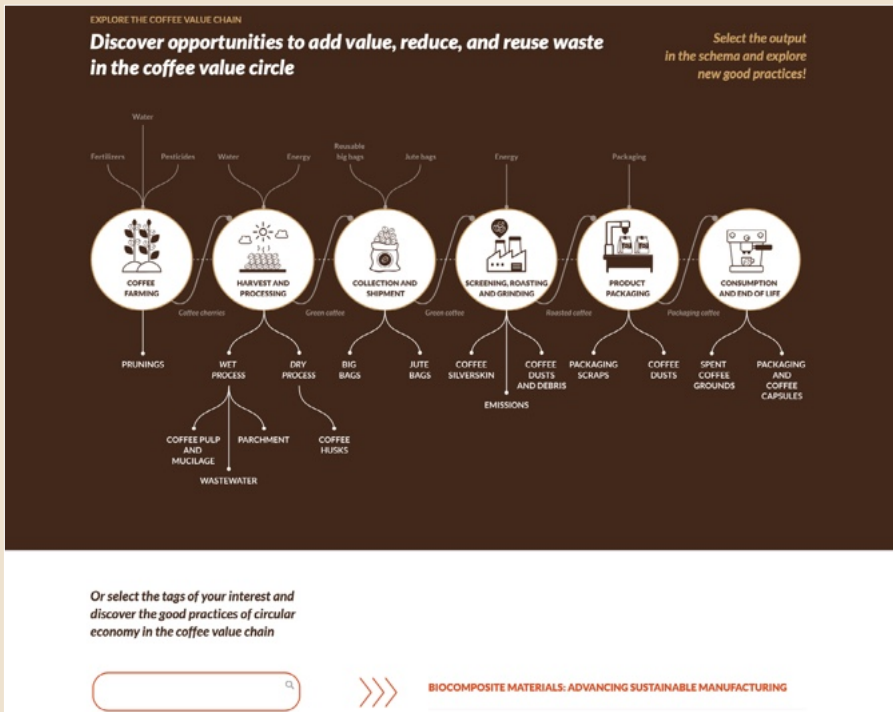


30 Good practices



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



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.



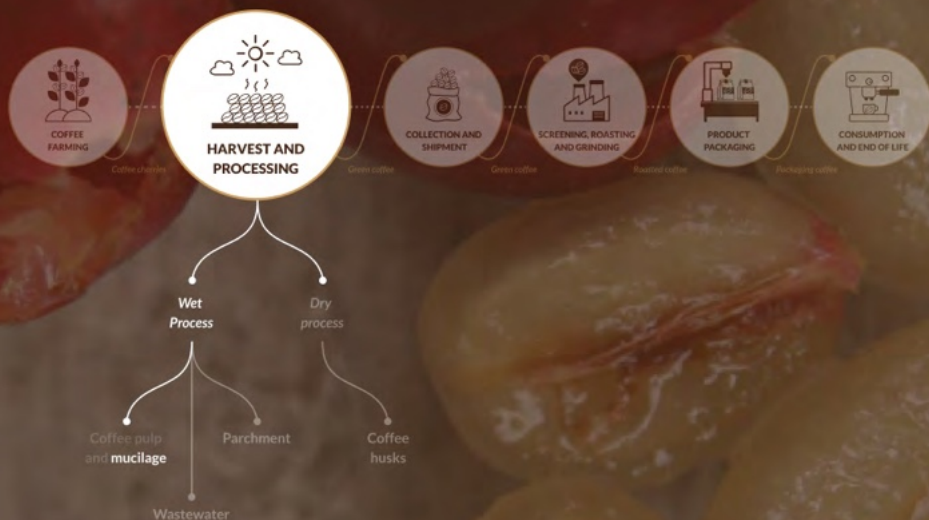
21–32%

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



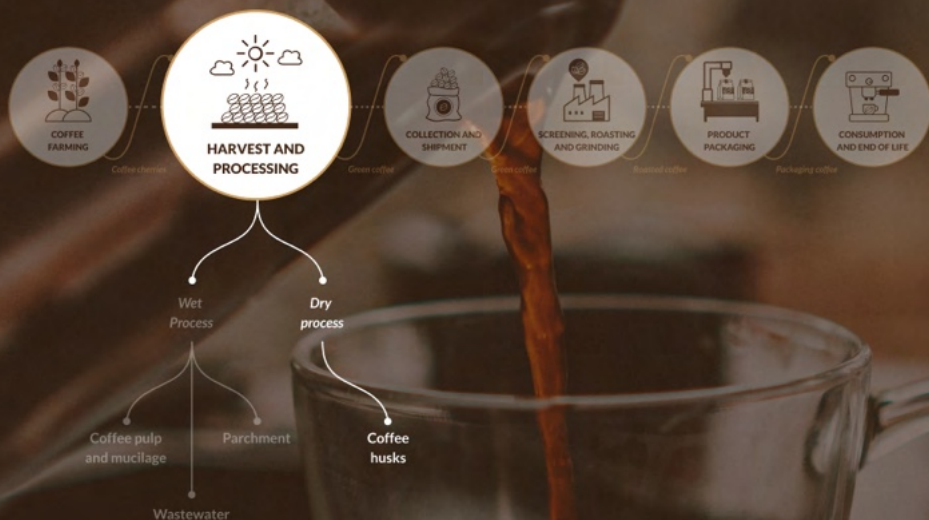
15% - 22%
of the weight of ripe fruit
is coffee mucilage.



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.

COFFEE & DATA

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. Comissioned 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.



Pilot Project and Research





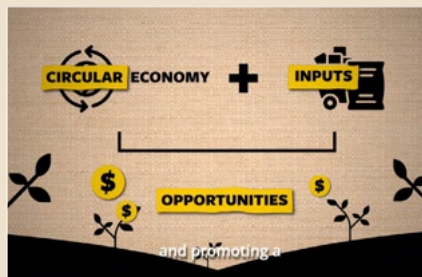
Press Coverage



Editorials



FRESH CUP



Solidaridad



Renewable Matter



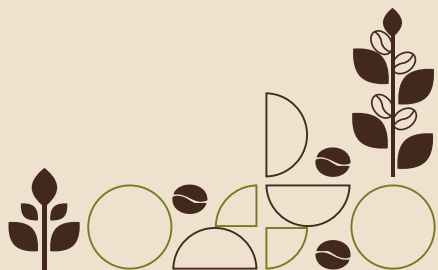
ESG News The Sustainable Economy Platform

**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 C4CEC





www.circulareconomyincoffee.org