ecobean

COFFEE WASTE REINVENTED

WE VALORISE THE FULL POTENTIAL

of Spent Coffee Grounds

EcoBean, a patented technology

provider and **certified B Corp**, pioneers the full valorization of SCG, turning this rich biomass into stable, **low-carbon footprint ingredients**.

Certified B Corporation

Unlocking 12 mln tons of potential

The global coffee industry generates approximately **12 mln tons of Spent Coffee Grounds (SCG)** annually. Over 4 mln tons come from industrial sites (instant coffee plants, cold-brew lines, roasteries), where this rich biomass is typically burned or composted, releasing emissions instead of value. SCG represents a significant **lost economic opportunity** and an environmental burden.

EcoBean, a patented technology provider and certified B Corp, pioneers the full valorization of SCG, turning this rich biomass into high-value, low-carbon footprint ingredients.

The dual impact: EcoBean's proprietary platform offers a dual-impact approach:

- **Preventing SCG from being wasted** and reducing associated emissions.
- **Enabling the global shift toward sustainable, bio-based alternatives** through its technology.

Our core identity

Innovation

Patented full valorization. The world's most advanced, patented technology to unlock the full economic potential of Spent Coffee Grounds (SCG).

Quality

Guaranteed industrial stability. Our repeatable **process** delivers **stable ingredients** that meet strict quality standards for the cosmetics, food, and materials industries.

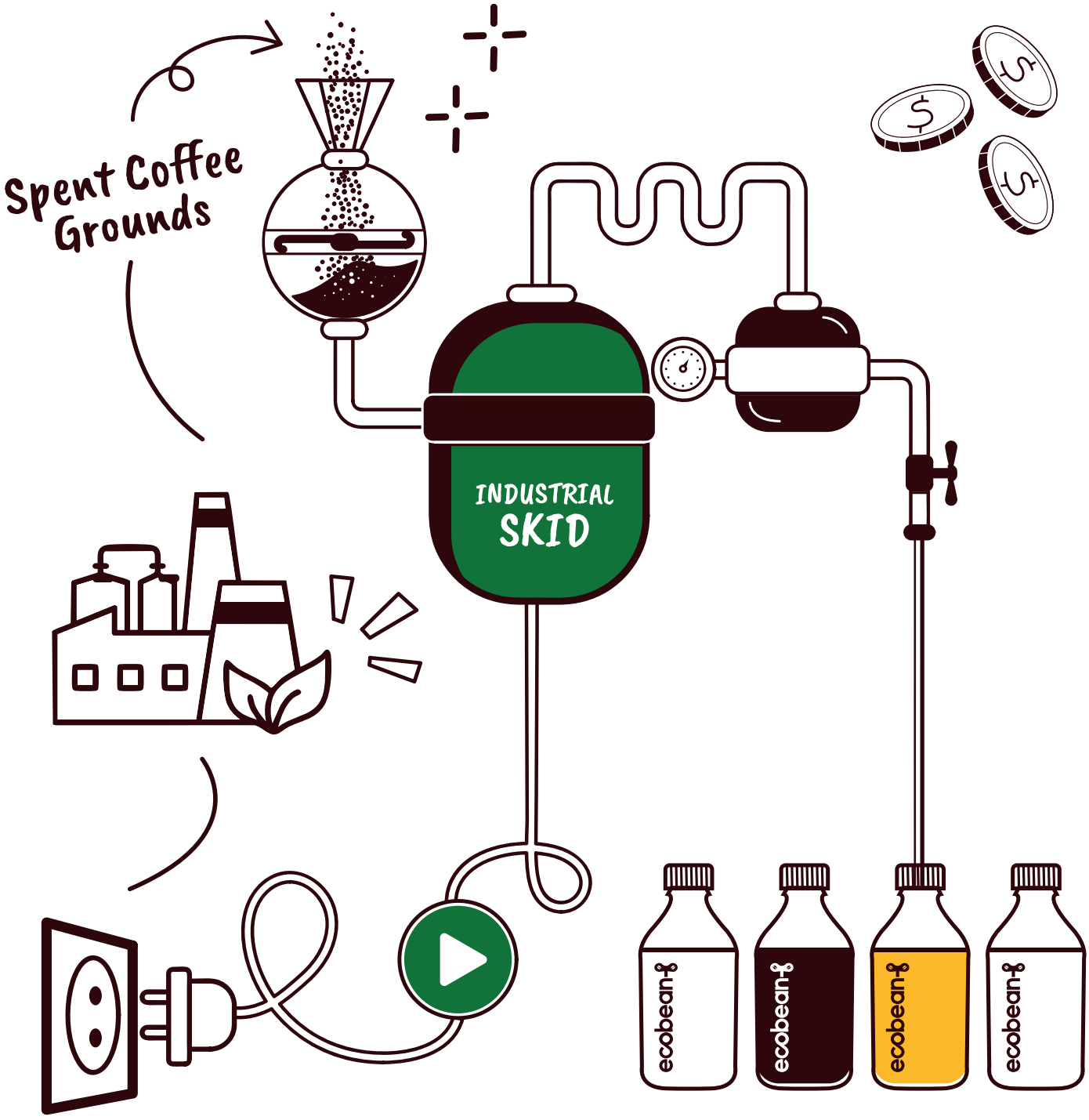
Circularity

The Core of Value Creation. We **convert waste into new possibilities**, unlocking new revenue streams and opportunities for the coffee and ingredients industries.


ecobean

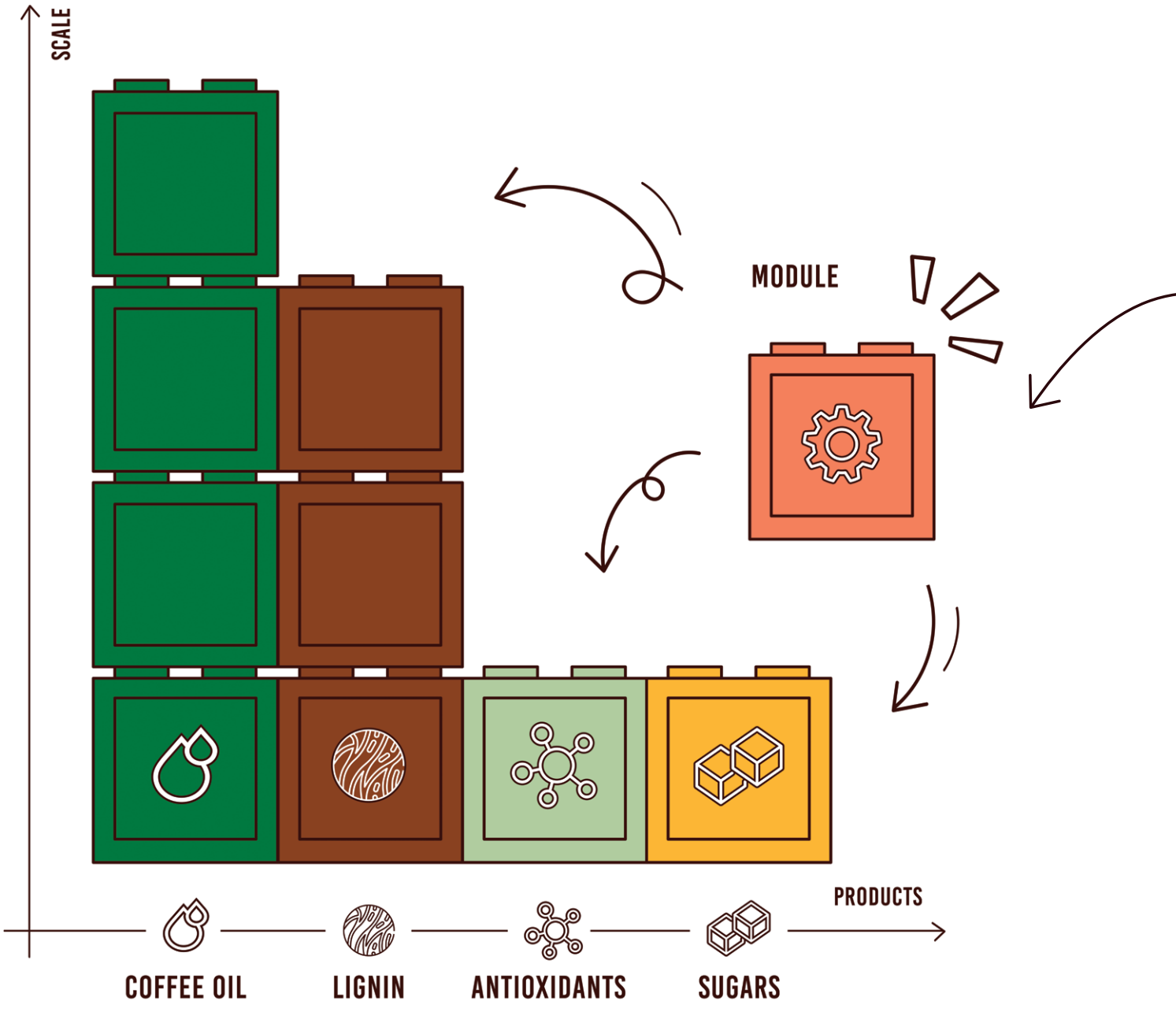
Turning coffee waste into industry advantage

EcoBean delivers first of a kind, industrial technology solution for SCG valorization, designed for seamless integration into high-volume industrial coffee production sites



Modular and scalable design

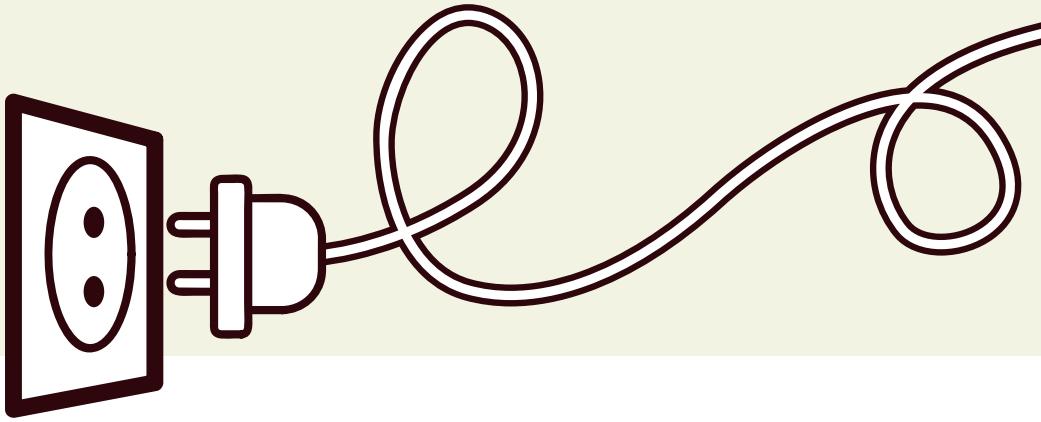
- **Varying capacity:** Adapts seamlessly to your SCG output volume (e.g., annually).
- **Diverse processing types:** Ensures compatibility with diverse methods (spray drying, freeze drying, cold brewing).
- **Unique SCG composition:** Modules are configured based on your feedstock's specific content, maximizing yield and quality.
- **Future-proof:** Allows for non-disruptive scaling as your production volumes increase.



Plug & Play integration

Our SKID installation is engineered to enhance your operations without disruption. Delivered in self-contained, compact modules, integration is simple:

- **Non-disruptive:** Requires no complex modifications to your current production line.
- **Simple connection:** Connects only to essential utilities and the SCG feedstock source.
- **Immediate value:** Your existing production line runs smoothly while the EcoBean SKID immediately begins transforming waste into a profit-generating resource.



Oil Module

Uses efficient solvent extraction (with a closed solvent loop) to extract coffee oil from SCG. The module can be adjusted to process any type of SCG (industrial, HoReCa,). The lipid fraction (oil and waxes) extraction yield can reach up to 29%

Lignin Module

Enables the recovery of lignin from SCG. It utilizes the remaining solid fraction left after the oil and antioxidant extraction processes and converts it into a valuable product with a wide range of applications. The lignin recovery yield can reach up to 60% (including 7,5% of soluble lignin).

Antioxidant Module

Used for the extraction of antioxidants. It allows for water or ethanol extraction, depending custer requir ts d prduct applicati. The f al prduct c be the fo an extract or a lyophilizate (or both). The extraction yield can reach up to 8%.

Sugars Module

Designed for the extraction of sugars present in SCG and turn them into a syrup composed of valuable sugars like arabinose and mannose. The product can be used immediately or serve as an intermediate for further processing, such as the extraction of rare sugars. The sugar extraction yield can reach up to 25%

The process:
Technical overview

The EcoBean technology is an end-to-end biorefinery platform based on efficient extraction and hydrolysis processes.

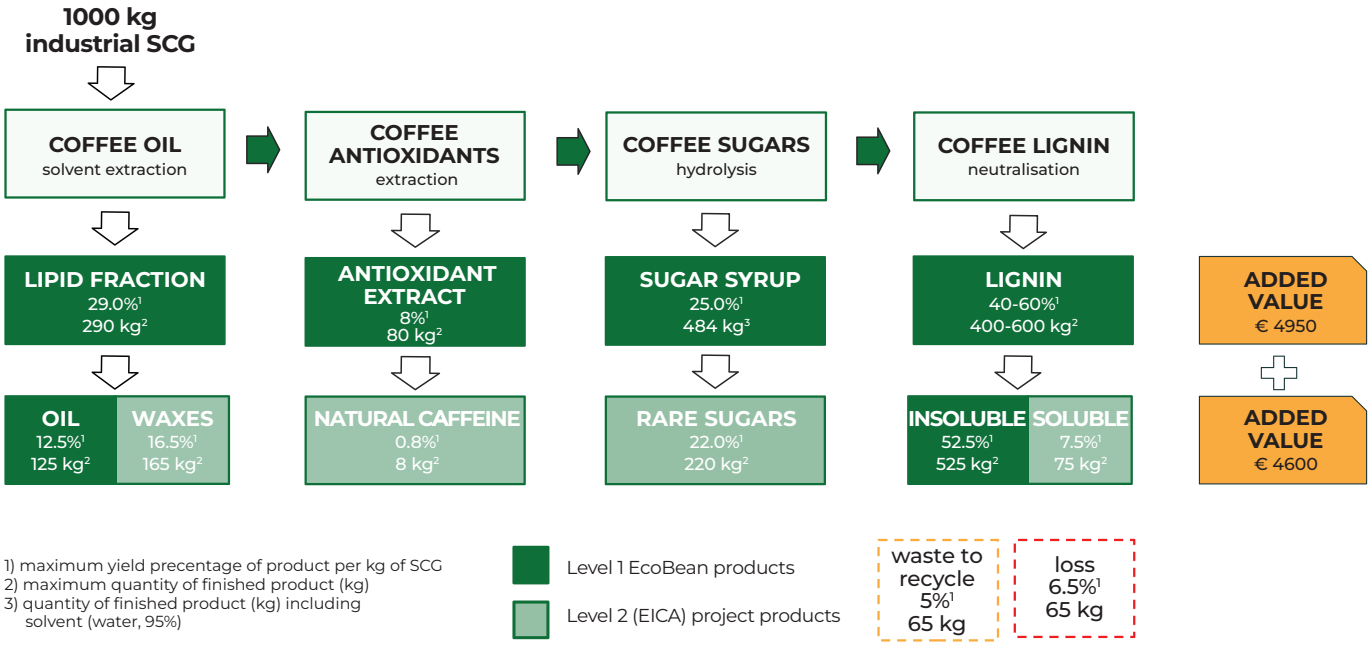
Process nodes

System compromised of key industrial components, including batch reactors, separation centrifuges (decanters), industrial dryers, vapor condensers, and falling-film evaporators.

Output fractions

The continuous process yields, stable, **refined** fractions: Coffee Oil, Antioxidant Extract, Sugars and Coffee Lignin.

Flexible technology process



1) maximum yield precentage of product per kg of SCG
2) maximum quantity of finished product (kg)
3) quantity of finished product (kg) including solvent (water, 95%)

Maximize return with full valorization

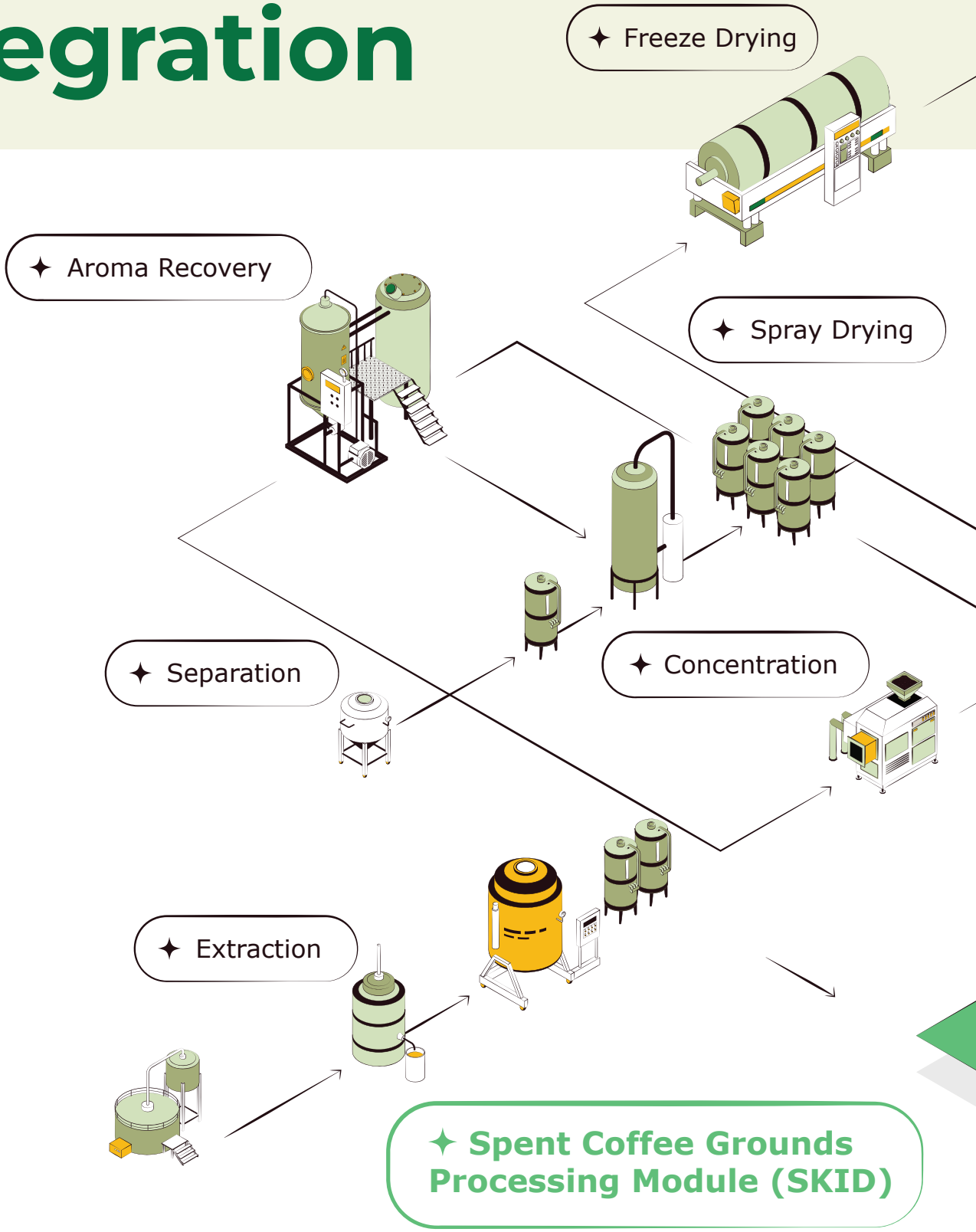
EcoBean is the only market provider to offer Full Valorization, recovering all high-value compounds in a single, continuous process.

- **Maximized ROI:** Capturing lipids, antioxidants, sugars, and lignin ensures the highest possible return from a single feedstock.
- **Zero waste approach:** Utilizes the entire SCG biomass, drastically minimizing residual material requiring disposal.
- **Consistent quality:** The integrated process ensures high purity and consistent quality across all resultant upcycled ingredients.

On-site revenue generation

By implementing the biorefinery directly at the source of the waste, we eliminate complex logistics and external processing costs. Spent Coffee Grounds become a circular revenue stream right where they are generated.

Industrial readiness: Proven scale and seamless integration

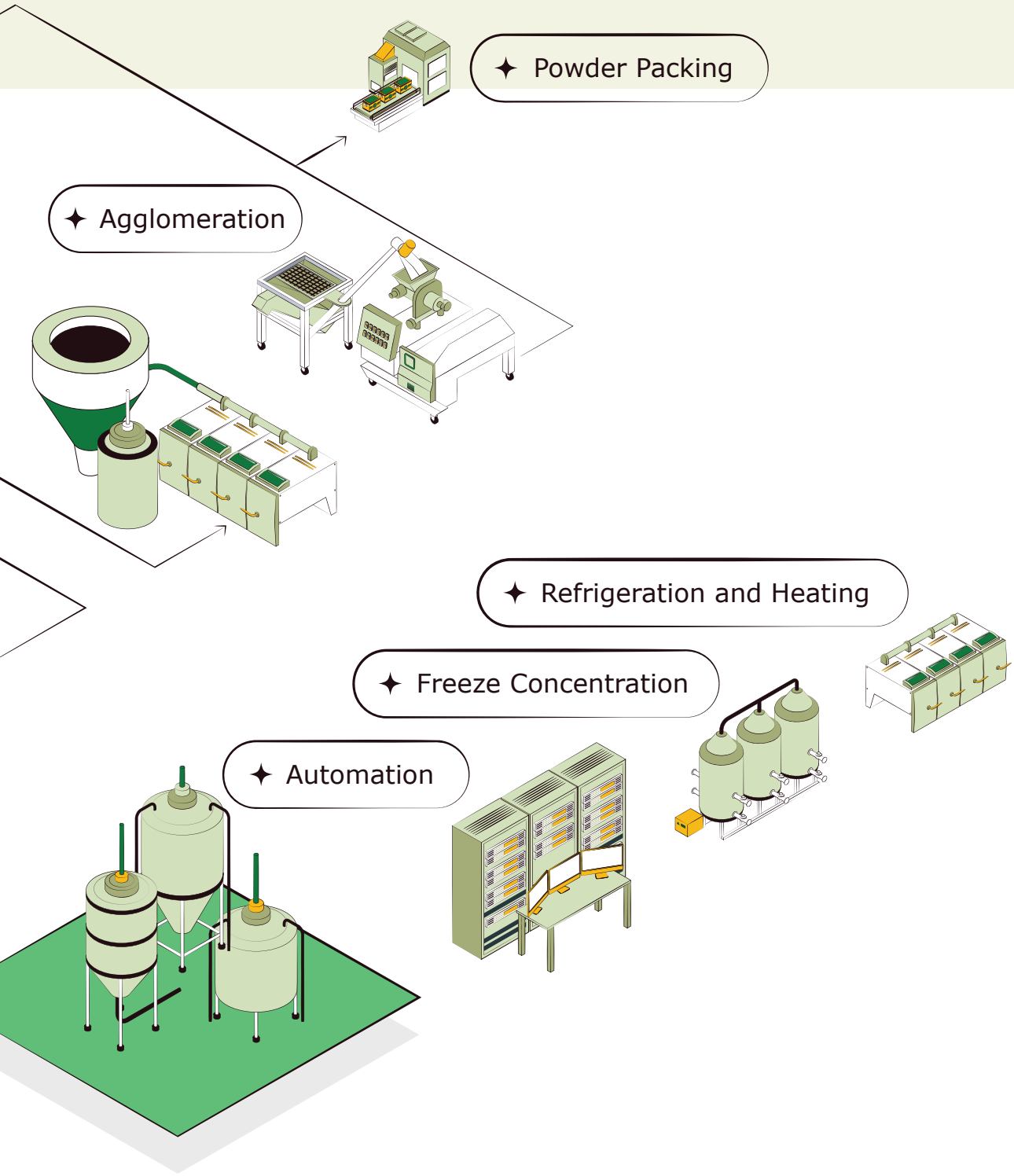


De-risked implementation

Our platform is engineered for immediate industrial deployment. Our collaboration with a strategic engineering partner, a global leader in process expertise and plant design, de-risks the industrial scale-up and delivery of our technology, ensuring rapid replication across global markets.

Low operational overhead

The SKID unit is designed for autonomous operation with minimal user interaction.



Ingredients born from nature crafted by circularity

Every cup of coffee releases just a fraction of the bean's inherent power-leaving behind potent bioactives like polyphenols, lipids, and proteins. EcoBean captures these valuable compounds from Spent Coffee Grounds and fully valorizes them into stable, bio-based inputs for the cosmetics, food, and advanced materials sectors, guaranteeing both technical performance and circular integrity.

Coffee Oil

Antioxidants

Lignin

Sugars

A new standard for B2B sourcing

EcoBean delivers the critical combination of quality, sustainability, and industrial readiness that modern supply chains demand:

Coffee Oil

2-5 TIMES HIGHER
PHENOLIC CONTENT*

*compared to coffee oils derived from beans

1,03

kg CO^2e / kg
of the product

INCI name: Coffea Arabica/Canephora Seed Oil

Main Characteristics / Competitive Advantage

Coffee Oil imbues a unique aromatic richness and deep coffee hue. It is abundant in a variety of compounds, primarily fatty acids, but also numerous antioxidants, such as caffeine and vitamin E, sterols, tocopherols and diterpenes, including cafestol and kahweol, which makes it suitable in various industries as an excellent alternative to typical coffee beans oils and some other vegetable oils. Thanks to its rich composition, Coffee Oil has a wide range of benefits, including UVB protection, antioxidant and anti-inflammatory properties.

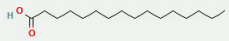
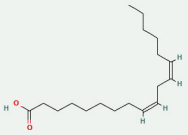
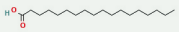
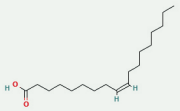
Food Industry
Amplifies flavor and aroma in confectionery, baked goods, and beverages.

Cosmetics & Personal Care
Employs in skincare products for hydration, skin tightening, and UV protection. A naturally aromatic oil with extraordinary phenolic content and unique fatty acid profile, highly stable and heat-resistant. It has a wide range of benefits, including UVB protection, antioxidant and anti-inflammatory properties.

Petrochemical Industry
Harnesses high fatty acid content as an upcycled biodiesel feedstock.

Pharmaceuticals
Incorporates for antioxidant and anti-inflammatory benefits in creams and supplements.

PRODUCT

Product Name	Coffee oil			
Processing Method	extraction + filtration + evaporation			
Main Ingredients (in the product as esters with glycerol)	**Chemical Name**	**Chemical Structure**	**CAS-no**	**Fatty acid composition** (as % of total fatty acids)
	palmitic acid		57-10-3	30-50%
	linoleic acid		60-33-3	30-50%
	stearic acid		57-11-4	5-8%
	oleic acid		112-80-1	5-9%
	arachidic acid		506-30-9	0,5-3%

PHYSICAL PARAMETERS

State of matter	thick liquid	**Odour**	woody and spicy
Colour	dark brown and caramel	**Clarity**	clear liquid
Density (in 20°C)	0.93-0.98 g/ml	**Flash point**	>175°C
Mycotoxins	none	**Density (in 20°C)**	0.93-0.98 g/ml
Solubility	miscible in hexane, heptane, acetone and diethyl ether, immiscible in water, ethanol and acetonitrile		
Technical specification of products	Purified grade and/or technical grade (at least 90% of the substance)		
Packaging	100 ml dark bottle		
Storage	in dark and cool conditions		
Freedom to operate / IP protection status	Patent application no. P.447416 (pending)		
INCI name	Coffea Arabica/Canephora Seed Oil		
Natural index (ISO 16128) in cosmetics	1		
Application Examples (Active Ingredients)	Petrol industry add-on to biodiesel (as an energy additive) and Cosmetics Industry - sk care prducts. petroh ical dustry as a bidiesel additive (after tr sesterifi-cation), in cosmetic industry as a soaps, peelings for face and body creams		

Antioxidants

INCI name: Coffea Arabica Extract, Coffea Robusta Extract

Main Characteristics / Competitive Advantage

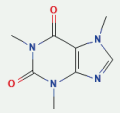
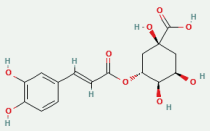
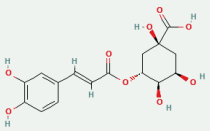
Antioxidants, key compounds in mitigating oxidative stress, offer a host of benefits. They're known for combating inflammation, shielding against UV radiation, and potentially warding off diseases like heart disease, diabetes, cancer, Alzheimer's and Parkinson's, coffee waste yields powerful antioxidants like chlorogenic acid and caffeine, underlining the broad potential of these vital compounds which find customers in various industries:

Food Industry
Antioxidants act as critical preservatives and flavor enhancers, extending shelf-life and boosting taste profiles.

Cosmetics Industry
They are indispensable for protecting skin from environmental damage and aging, found in various skincare and beauty products.

Packaging Industry
Emerging uses in active packaging for food and beverage items to maintain freshness and improve shelf life.

PRODUCT

Product Name	Antioxidants extract		
Processing Method	extraction → filtration → concentration → lyophilization		
Main Ingredients	**Chemical Name**	**Chemical Structure**	**CAS-no**
	caffeine		58-08-2
	chlorogenic acid		327-97-9
	caffeic acid		331-39-5

PHYSICAL PARAMETERS

State of matter	powder/aqueous solution/ethanol solution
Odour	alcohol and coffee/mildly coffee
Colour	stable, strong dark brown
Clarity	clear liquid
Solubility	miscible in water and ethanol
Density (in 20°C)	ethanol solution 0.910-0.960 g/ml , water solution 0.980-0.995 g/ml
Flash point	n/a
Mycotoxins	none
Technical specification of products	Extra purified grade (at least >98% of the substance)
Packaging	100ml dark bottle
Storage	frozen in stock/in a dark and cool conditions
Application Examples (Active Ingredients)	In cosmetic industry as creams, lotions and masks, in pharmaceutical industry as drugs and supplement ingredients
kg CO2e / kg of the product	1.17 kg CO2e/kg of the product
Freedom to operate / IP protection status	Patent application no. P.447416 (pending)
INCI name	Coffea Arabica Extract, Coffea Robusta Extract
Natural index (ISO 16128) in cosmetics	1

Sugars

Main Characteristics / Competitive Advantage

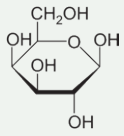
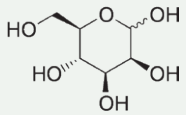
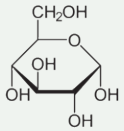
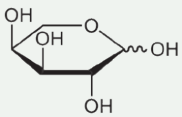
Spent Coffee Grounds are rich in poly-saccharides, which our process converts into assimilable monosaccharides. This upcycled syrup is a high-potential source of sugars such as galactose and man-nose, which are efficiently metabolized by microorganisms for fermentation processes. It presents a viable, bio-based alternative, offering functional properties like humectancy in cosmetics and the potential to reduce the glycemic index of food due to arabinose content.

Biotechnology Industry
Used as a carbon source for the cultivation of bacteria, yeasts, and fungi. It is an excellent supplement or culture medium for specialized fermentations, including the production of ethanol and lactic acid.

Food Industry
Functions as a less sweet sweetener substitute suitable for confectionery, beverages, baked goods, and sauces. It can be used as an energy source in functional foods.

Cosmetics Industry
The sugars act as humectants, improving skin hydration by binding water in the epidermis. The syrup can also stabilize other substances in formulations.

PRODUCT

Product Name	Sugars			
Processing Method	extraction + filtration + evaporation			
Main Ingredients	**Chemical Name**	**Chemical Structure**	**CAS-no**	**Sugar composition** (as % of total sugars)
	galactose		59-23-4	80-90
	mannose		3458-28-4	
	glucose		50-99-7	1-3
	arabinose		5328-37-0	5-10

PHYSICAL PARAMETERS

Density (in 20°C)	1.35 - 1.42
Dry mass	> 65 %
Packaging	100ml bottle
Storage	in a dark and dry conditions

Lignin

Main Characteristics / Competitive Advantage

Lignin, the second most abundant polymer, constitutes about 20-25% of dry coffee waste.
This branched polymer is sourced sustainably from coffee waste, offering distinct advantages:

Bioenergy
Ideal for bioplastics production.

Chemical Industry
A renewable source of phenols and aromatics.

Material Science
Useful in manufacturing carbon fibers, adhesives, insulation.

Agriculture
Functions as a slow-release fertilizer and soil conditioner. With coffee waste as a sustainable lignin source, its applications across diverse markets

PRODUCT

Product Name	Lignin
Chemical Structure	polymers made by cross-linking phenolic precursors
CAS-no	9005-53-2 (alkaline lignin)
Processing Method	hydrolysis →purification →neutralization

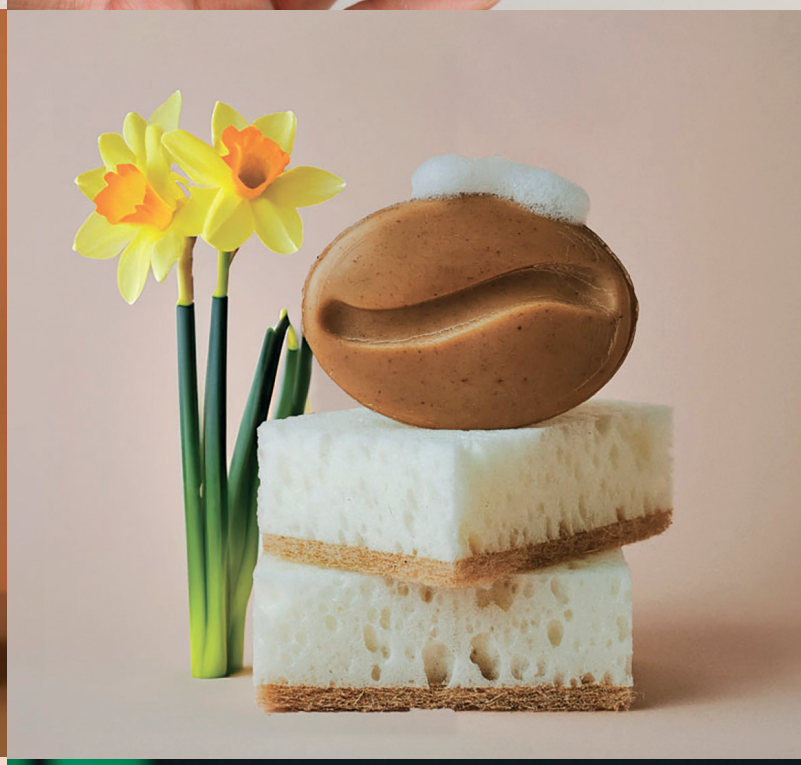
PHYSICAL PARAMETERS

State of matter	powder
Odour	woody and chocolate-citrus
Colour	chocolate colour, rich and deep
Granularity	tiny flour
Solubility	insoluble in water
Packaging	in bags with a batch weight of 0.5 kg
Storage	in dry storage
Application Examples (Active Ingredients)	In HoReCa industry as utensils, in 3d printing as a filament and other materials industry as fibers and fillers in composites
kg CO2e / kg of the product	0,77 kg CO2e/kg of the product
Freedom to operate / IP protection status	Patent application no. P.447416 (pending)

A vast range of applications

Achieve a powerful reduction of your environmental impact without compromising product quality, all while benefiting from the low switching costs associated with integrating EcoBean's ingredients.


COFFEE WASTE REINVENTED
SUGARS
Coffee sugars are rich in rare sugars such as arabinose and mannose. Arabinose supports healthy blood sugar management, while mannose promotes urinary tract and gut health. Ideal for functional foods, beverages, and nutraceuticals.
ecobean.pl
ecobean




COFFEE WASTE REINVENTED
ANTIOXIDANTS
ecobean
Strawberry Sparkle
KRAST
Energy & Happy Belly Soda
Strawberry Sparkle
KRAST
Energy & Happy Belly Soda

ecobean

READY TO INNOVATE?

CONTACT US TO UNLOCK THE FULL POTENTIAL OF SPENT COFFEE GROUNDS

www.ecobean.pl contact@ecobean.pl