

Ensemble pour un futur plus durable

Les solutions et la stratégie d'Evonik pour les prochaines générations de cosmétiques

Beauty Tech Event by ADARA France

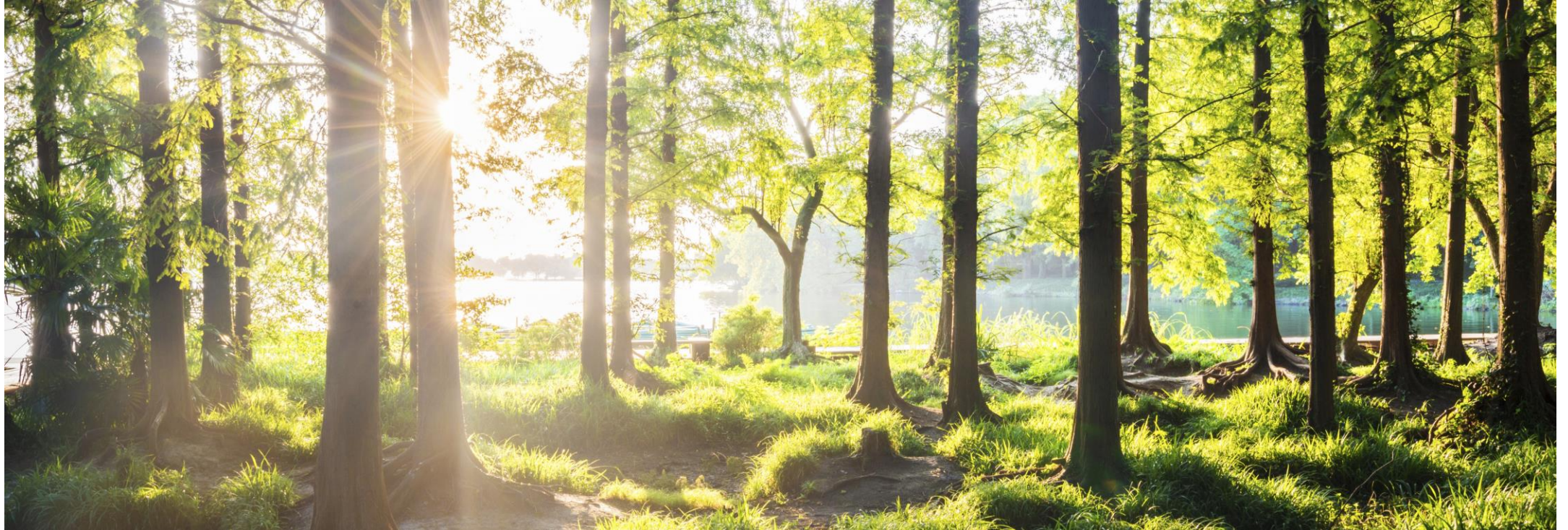
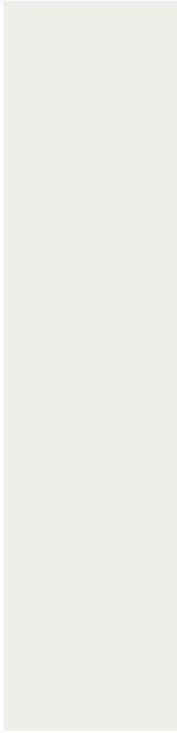
06.06.2023 | Samir Sliman

Agenda

- 1. THE CARETAIN® GUIDE BOOK - Sustainability at Care Solutions**
2. ECOHANCE® Program
3. ECOHANCE® Care PS3
4. Enzymatic emollients
5. VARISOFT® EQ 90

THE CARETAIN® GUIDE BOOK

Sustainability at Care Solutions



THE CARETAIN® GUIDE BOOK

Sustainability at Care Solutions



WHY WE DO IT

WHAT MATTERS

HOW WE DO IT

WHY WE DO IT

ESCALATING CONSUMPTION AND DECLINING RESOURCES

.....

If we would continue
consuming like this
we would need 1.75
earths.¹

1.75

INCREASED GREENHOUSE GAS EMISSIONS

.....

Emissions increase
exponentially due to
human activities



INCREASED GLOBAL WARMING

.....

A temperature increase of
2 °C compared to the pre-
industrial era has serious
negative impacts on the
natural environment and
on human health and
well-being²

2°C

Need for new
set up of
consumers
goods and
respective
ingredients

¹[Global Footprint Network](#)

²[Climate Action](#)

Why We Care



Climate Challenges

- increased greenhouse gas emissions
- increased sensitivity of global warming

Supply Chain Challenges

- declining resources of feedstocks
- declining resources of energies
- escalating consumption

Community Challenges

- demographic changes
- low empowerment of women, regional communities, small stakeholders, etc.

Market Challenges

- consumers' increasing needs of good health and well-being
- innovation challenges of good environmental performance goods

WHAT MATTERS

VARIOUS THINGS TO CONSIDER

PARC
Assessments

CDP, SBTi

Hydrogen
Strategy

ESG Targets

Sustainability
Strategy Dialog

Carbon
Footprint

EU Taxonomy

Circular
Plastics

Raw Material
Sourcing

Capital Market
Com.

ANCHORS OF OUR SUSTAINABLE STRATEGY

1

CO₂-Reduction
Roadmap

2

Sustainable Portfolio
Development

SUSTAINABILITY TARGETS

2030 Carbon Footprint
according to Science
Based Targets

.....
> 40%
"NEXT GENERATION
SOLUTIONS"

.....
< 10%
TRANSITIONER and
CHALLENGED

WHAT MATTERS @ CS NOW



**Fight Climate
Change**

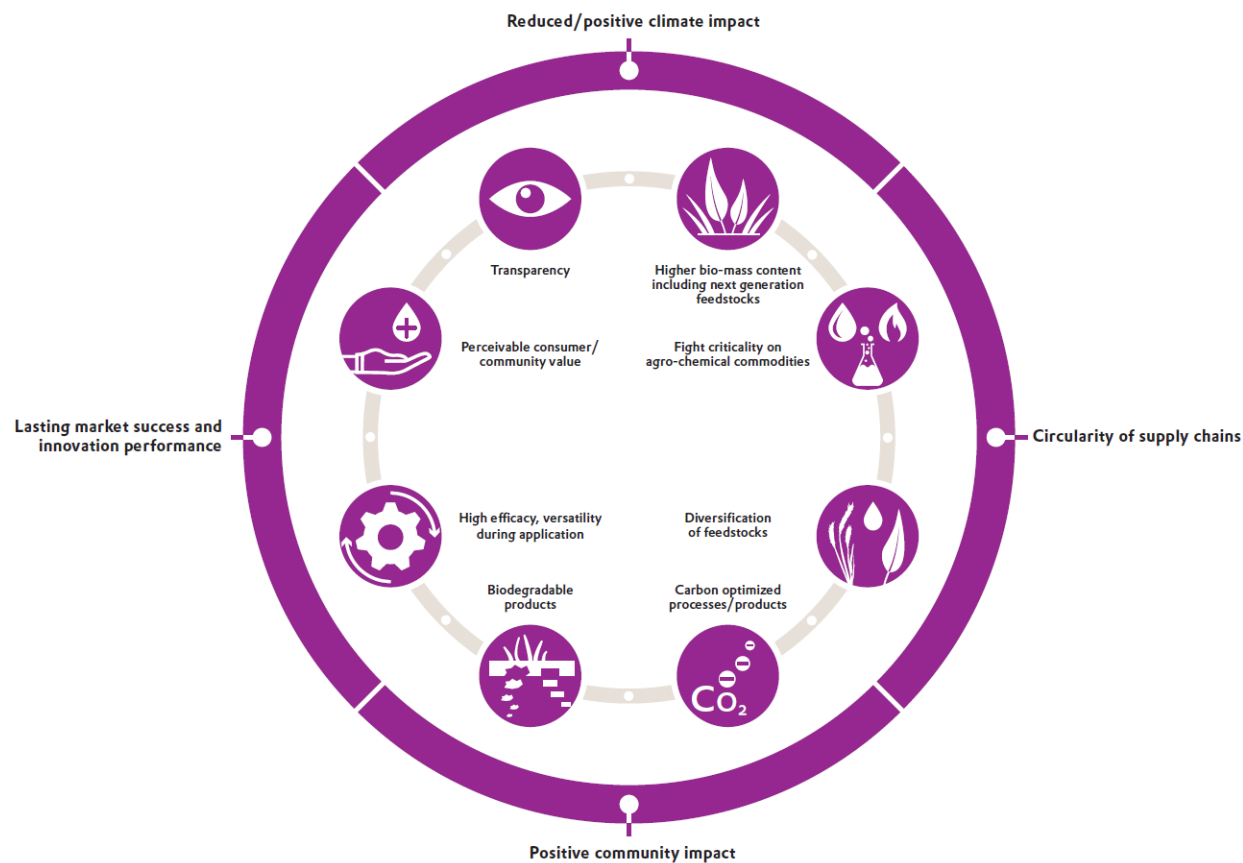
**Drive
Circularity**

**Safeguard
Ecosystems**

**Ensure Health
& Wellbeing**

HOW WE DO IT

THE CARETAIN® GUIDING PRINCIPLES



Portfolio transformation towards quantified sustainable attributes for

- Less CO₂ emissions
- More transparency
- Circularity of supply chains
- Lasting market success and innovation performance
- A positive community impact

THE CAREtain® CIRCLE

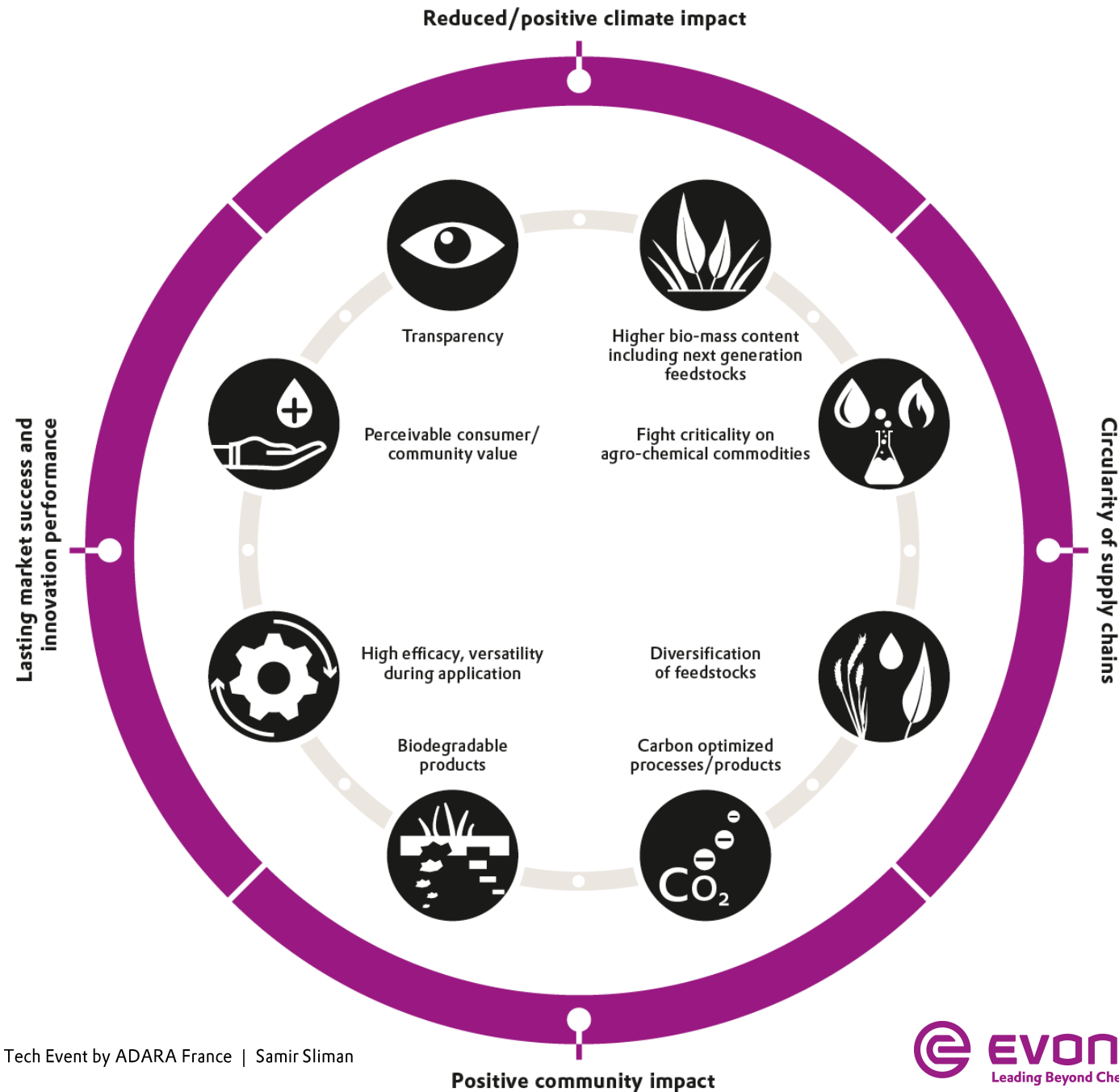
.....

More Advanced
More Comprehensive
More Systematic

.....

4 TARGETS, 8 FOCUS AREAS

- Transparency is the basic ingredient for sustainable beauty products.
- With CAREtain®, we enable a portfolio transformation according to clearly defined principles.



CAREtain[®] CIRCLE'S *8 focus areas*



**higher biomass content
including next-generation
feedstocks**



**diversification of
feedstocks**



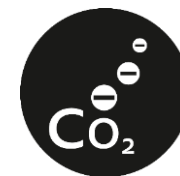
biodegradable products



**perceivable consumer/
community value**



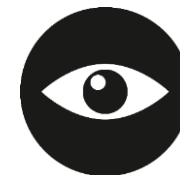
**fight criticality on agro-
chemical commodities**



**carbon-optimized
processes/ products**



**high efficacy, versatility
during application**



transparency

CAREtain®

CIRCLE'S

8 focus areas



**higher biomass content
including next-generation
feedstocks**

- preserve valuable high carbon stock areas
- de-escalate the use of tropical oils
- setup traceable and segregated supply chains to enable fair integration of communities and compliance to human rights



biodegradable products

- develop biodegradable and obtain circularity of biomass based ingredients with lowest aquatic burden



**fight circularity on agro-
chemical commodities**

- transform fossil starting materials towards renewable next-generation oleochemical resources and de-escalate deforestation



**high efficacy, versatility
during application**

- achieve high eco-application efficacy by lowering the organic and energy impact during application for eco-designed consumer goods

CAREtain[®]

CIRCLE'S

8 focus areas



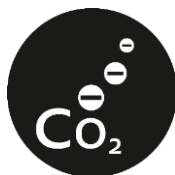
diversification of feedstocks

- drive diversification of feedstocks
- preserve biodiversity globally
- utilize different side streams and post-production residue with environmental efficacy



**perceivable consumer/
community value**

- deliver perceivable environmental values and positive contributions to the societies along the value chain



**carbon-optimized
processes/ products**

- drive innovation in process technology (more than green chemistry) to offer significant reduction of carbon emission and scalable product platforms



transparency

- take transparency as the mandatory principle and the key to assess the environmental performance and grant market compliance

How CAREtain® supports you in using our products



CAREtain®

Our approach to transparency and improved sustainability for everything we do



A **sustainability orientation** for our core business.

Our **entire value chain** is under consideration:

Make our impact **quantifiable and qualifiable**



CAREtain® Toolbox

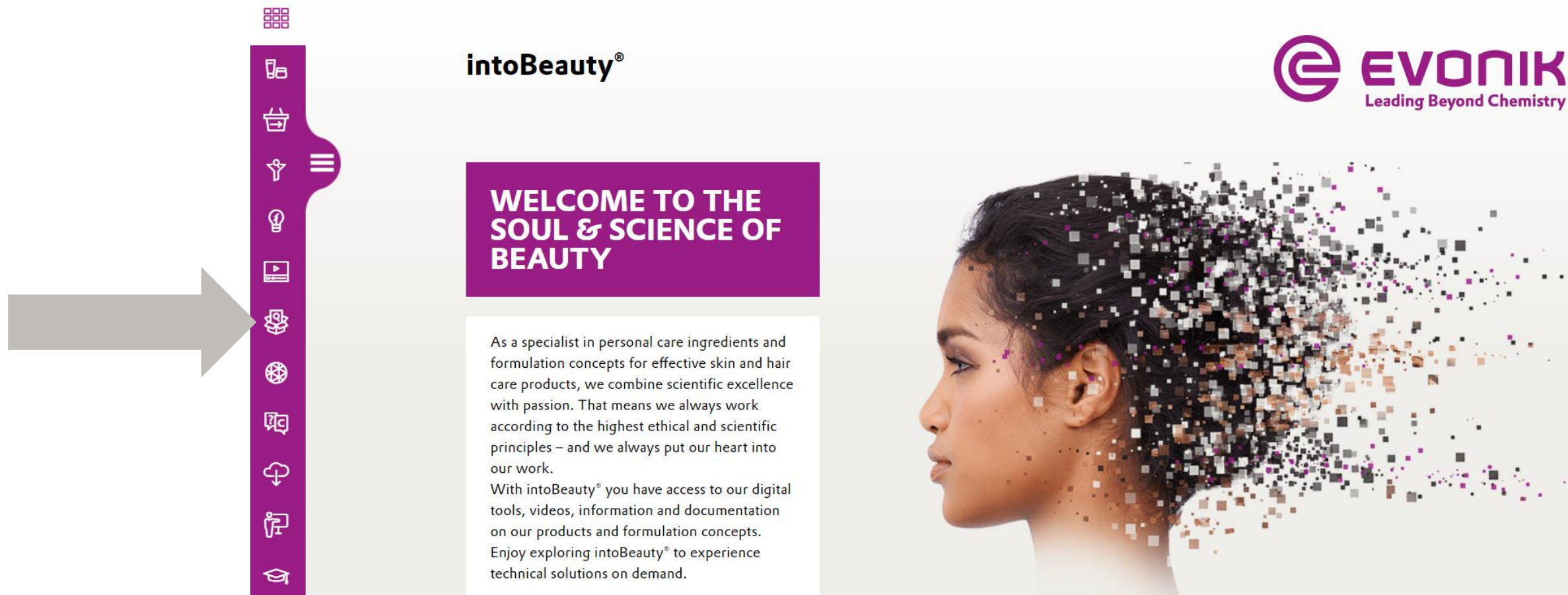
A unique and dynamic information system



Direct access for you via our **digital platform intoBeauty®**



We can get you started intoBeauty® – CAREtain® Toolbox



The image shows a digital interface for 'intoBeauty®'. On the left, a vertical purple sidebar contains a grid of icons at the top and a list of icons below, with a large grey arrow pointing to the list. The main content area has a white background. At the top right of this area is the 'intoBeauty®' logo. Below it is a purple rectangular box with the text 'WELCOME TO THE SOUL & SCIENCE OF BEAUTY' in white. Underneath this box is a paragraph of text. To the right of the text is a large image of a woman's profile, with her hair and face composed of a digital particle effect of small squares.

intoBeauty®

WELCOME TO THE SOUL & SCIENCE OF BEAUTY

As a specialist in personal care ingredients and formulation concepts for effective skin and hair care products, we combine scientific excellence with passion. That means we always work according to the highest ethical and scientific principles – and we always put our heart into our work.

With intoBeauty® you have access to our digital tools, videos, information and documentation on our products and formulation concepts. Enjoy exploring intoBeauty® to experience technical solutions on demand.

EVONIK
Leading Beyond Chemistry

<https://intobeauty.evonik.com/>

We can get you started intoBeauty® – CAREtain® Toolbox

Startcenter

Product Area

Sample order

Product Selection Tool

Trend-inspired concepts

Videos

CAREtain® Toolbox

Sensory Kaleidoscope

Ceramide Knowledge

Certificates & Factsheets

PRODUCT SEARCH

Full product search

SUSTAINABILITY CRITERIA

☐ Constitution

☐ ISO 16128 Interpretation

☐ Natural Cosmetic Compliance

☒ Origin / RSPO

☐ INCI

☐ Organic Part o_p

☐ Active

☒ Feedstocks

☐ COSMOS STATUS...

☐ Natural Index I_n

☐ Eco Application

☐ Synthetic Part s_p

☐ Residual Solvents

☒ Regional Origin

☐ Halal STATUS

☐ Natural Origin Index I...

☐ Eco Synthesis

☐ Animal Part a_p

☐ Residual Additives

☒ Responsible Sourcing...

☐ Kosher STATUS

☐ Organic Index I_o

☐ Reaction Type

☐ Carbon Distribution...

☒ Palmbased Part r_p

☐ Renewable electricity...

☐ Vegan

☐ Organic Origin Index ...

☐ Natural Part n_p

☐ Renewable Carbon C...

☒ RSPO Certification...

☐ NaTrue STATUS

☐ Biodegradability

Filter visible results...

>

🖨

Name

>

×

TEGO® Care PBS 6 MB

Category

Oil in water emulsifier

Palmbased Part r_p

RSPO Certification

Save as PDF handout (1 of max. 10)

Show marked products

Reset all

<https://intobeauty.evonik.com/caretaintoolbox/>

PRODUCTS WITH SUPERIOR SUSTAINABILITY BENEFITS

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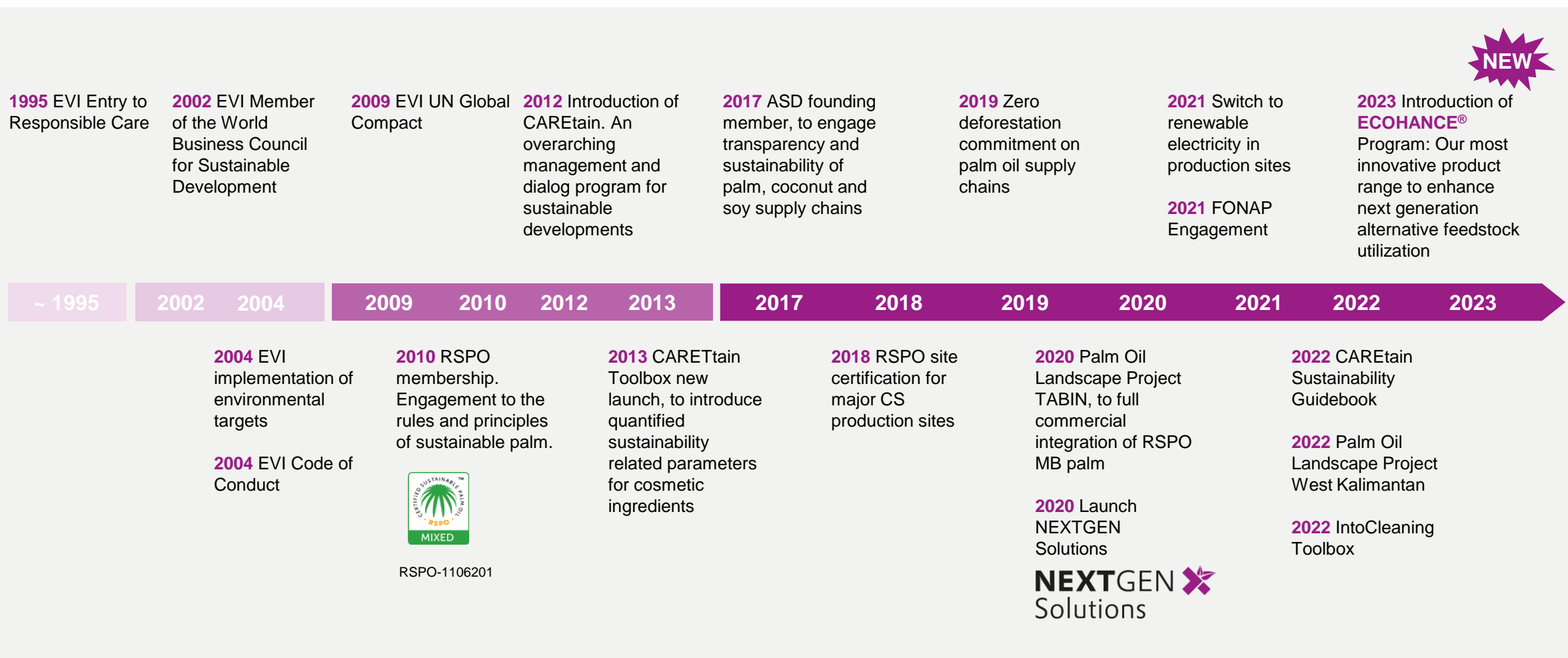
- Fight climate change.
- Drive circularity of supply chain.
- Generate positive community impact.
- Lasting market success & innovation performance.

NEXTGEN Solutions

.....

*Products are better equipped
to solve challenges
today & tomorrow*

Sustainability – an integral part of our business for more than 30 years





ECOHANCE® PROGRAM

*Enhance next generation
alternative feedstock
utilization*

ECOHANCE® PROGRAM

*Our most innovative product
range to enhance next
generation alternative feedstock
utilization*

- driven by our strong research and innovation on sustainable feedstock development and manufacturing
- leads significant breakthrough on sustainable solution in the oleochemical world
- brings consumer products to a new dimension



ECOHANCE® Program

Bringing a new dimension to consumer products

Feedstock



- sources **bio-mass based alternatives**, **production residues** and **side streams**.
- preserves valuable **nature reserves** and **carbon stocks**.
- drives **biodiversity** globally.

Supply Chain



- enables **fair integration** of communities and **traceable** supply chains.
- upscales and enhances more diverse sources through **innovative processing**.

High Performance



- achieves utmost **eco-application efficacy** during manufacturing and consumer application.
- designed for **cosmetic performance** and **modern formulation concepts**.

ECOHANCE® Program

Strong feedstock pipeline & more to come ...



Baobab oil



Camelina oil



Xylitol



Pelargonic acid



Olive oil fatty acids

Let's do better

*Looking forward to accompany you
on the way to protect the planet.*



When Upcycling Opportunities meet **CARE**

ECOHANCE® Care PS3

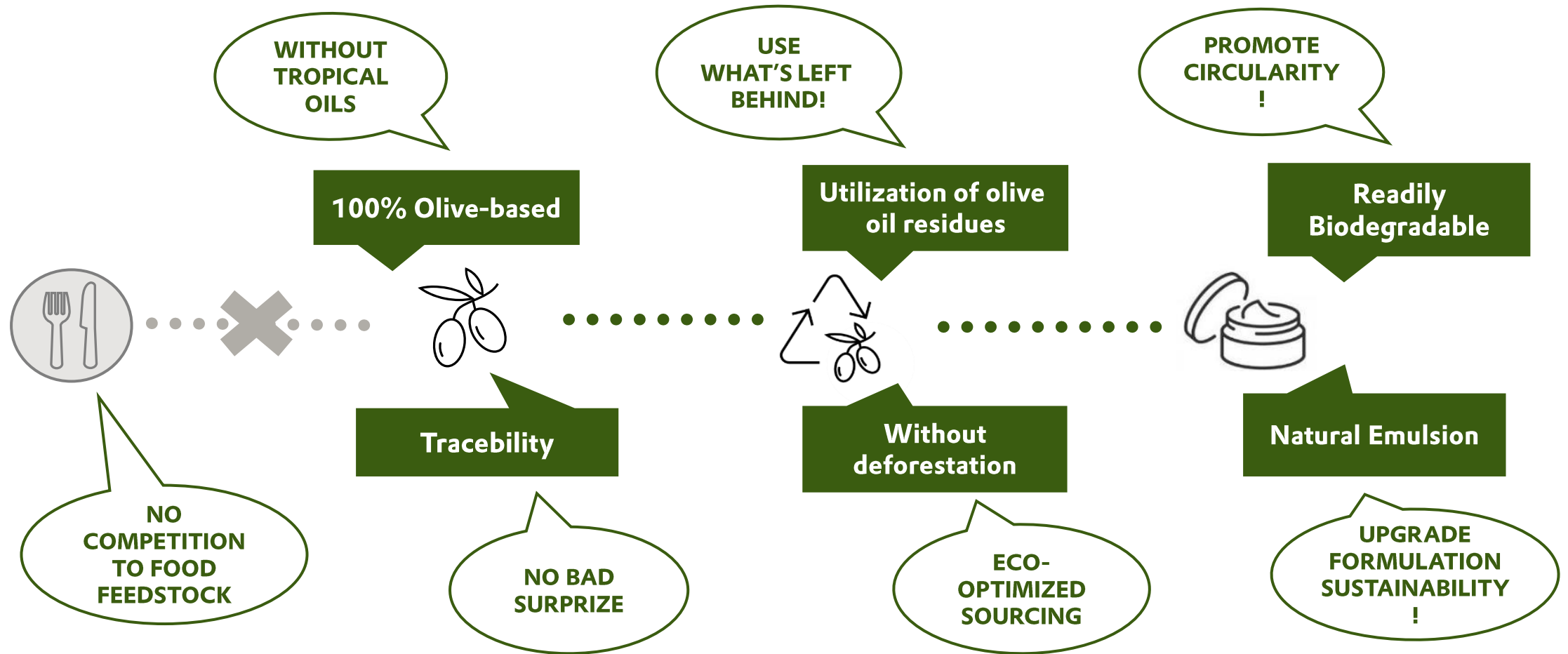
2023 | April
Global Skin Care Segment

Sustainability beyond just Bio-Based

An ideal emulsifier
to upgrade
formulation
sustainability
features



An Eco-Optimized Transformation Journey of Olive





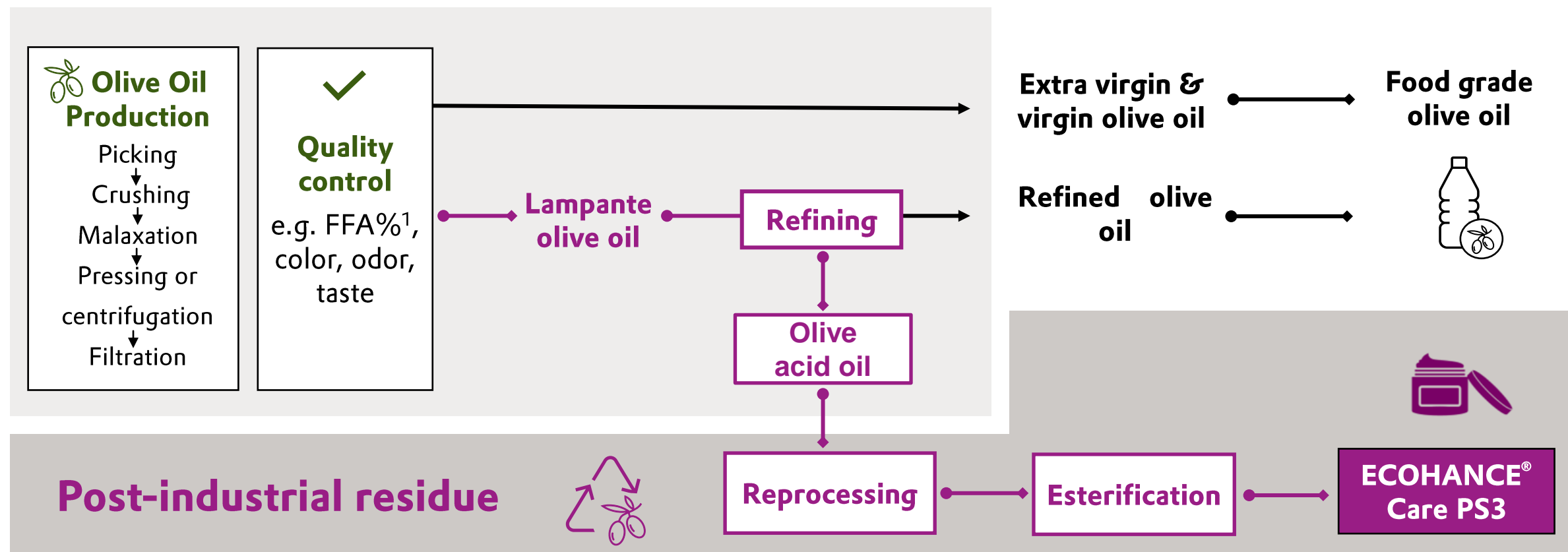
Mediterranean Origin



- ECOHANCE® Care PS3 is 100% **olive-based**.
- **No tropical oils** are involved in the production process.
- The olives are typically **sourced from** the Mediterranean region of the **EU**.
- Supply chain is **traceable** to mill level.
- Mills are located mainly in **Spain, Italy and Greece**.

From Olive Residue to Sustainable Emulsifier

Production Process Flow Diagram



Olive acid oil from olive pomace refining is used only in minor parts

¹FFA% = percentage of free fatty acids

What is Olive Acid Oil?

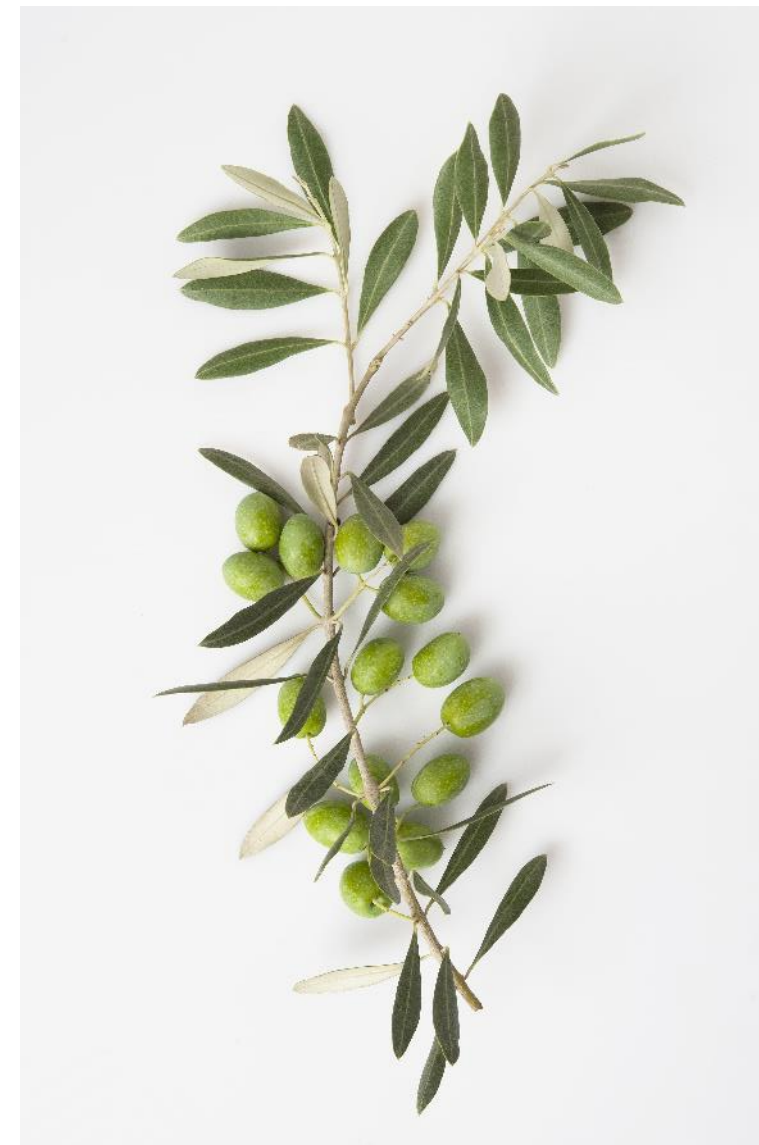


❑ Acidic residue from olive oil refinery

- Does **not fulfill food grade** quality standards regarding acidity, taste, odor or color.
- **High acidity** due to free fatty acids or mineral acid residues.
- Cannot be used for human or feed consumption according to legislation.
- Can only be used for technical applications.

❑ Source for fatty acids and glycerin

- ECOHANCE® Care PS3 is 100% based on fatty acids and glycerin obtained from olive acid oil.



ECOHANCE® Care PS3

PRODUCT PROFILE



INCI	POLYGLYCERYL-3 DISTEARATE
Type	O/W emulsifier
HLB	11
Usage concentration	2-4% recommended
China IECIC	YES
Biodegradability (OECD 301 F)	Readily biodegradable
Certification	ECOCERT, COSMOS

For natural
lotions &
creams!



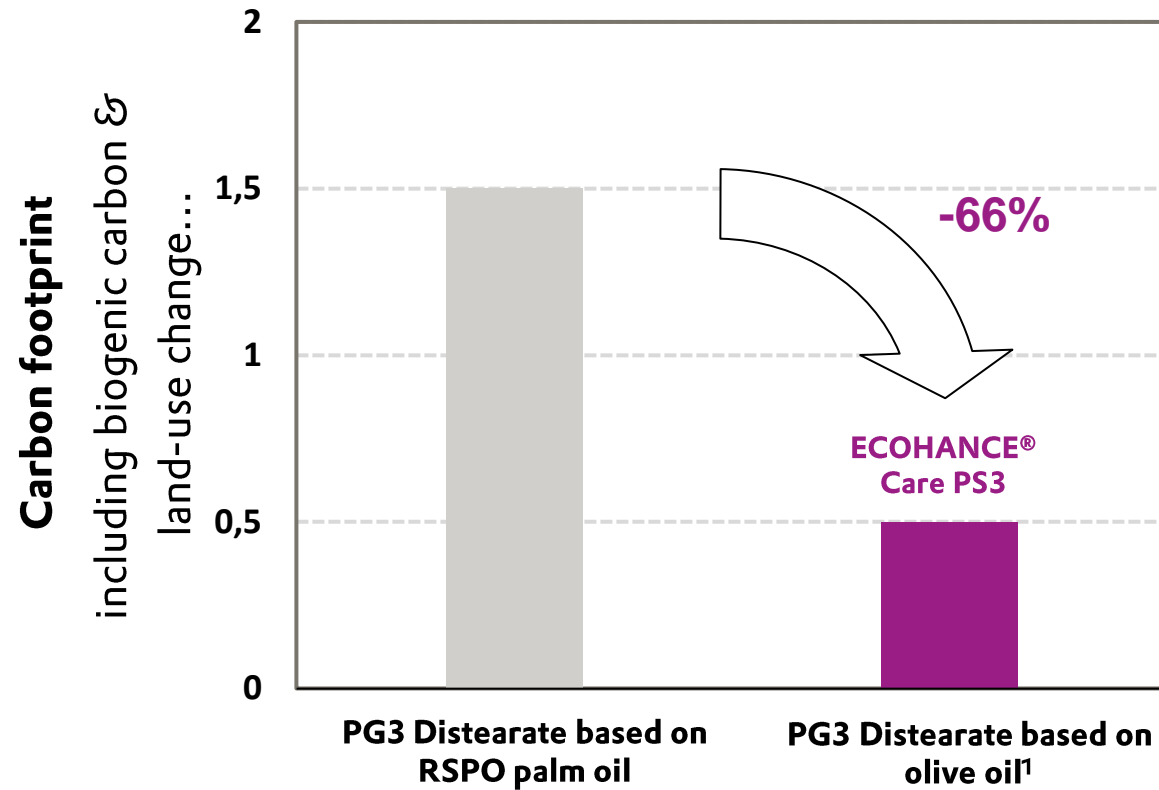


Let's go beyond bio-based



- No deforestation / Land-use change is ZERO / Landless
- No competition to food or feed production
- Fosters diversification along the supply (No tropical oils involved)
- Inclusion of small holders

Optimized Carbon Footprint



¹Calculation based on olive oil not on olive acid oil



Applications & Performance

LOTIONS & CREAMS

Suitable for emulsions with medium to high viscosity

NATURAL COSMETICS

Nice combination with natural oils & emollients

STABILITY

Efficient emulsifier even at low usage level

MOISTURIZATION

Good hydration properties

SKIN FEEL

Caring and soft skin feel with a flexible absorption profile

Emulsion Stability Comparison

ECOHANCE® Care PS3 vs. Benchmarks

	Ingredients	w/w%
A	Emulsifier	2.00
	TEGO® Alkanol 1618 MB (Cetearyl alcohol)	0.50
	Prunus amygdalus dulcis oil (Sweet almond oil)	12.00
	dermofeel® Toco 70 non-GMO (Tocopherol (and) Helianthus Annuus (Sunflower) Seed Oil)	0.20
B	Water	80.60
	Glycerin	3.00
	Xanthan Gum	0.20
C	Verstatil® SL non GMO (Aqua (and) Sodium Levulinate (and) Potassium Sorbate)	1.5

Emulsion stability test:

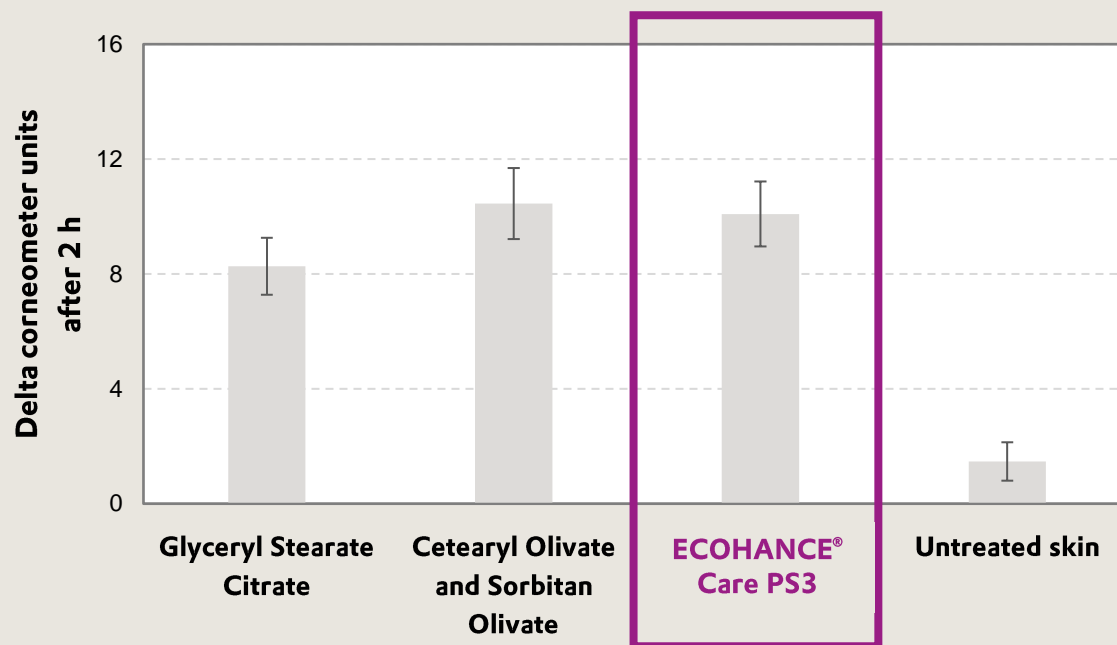
Storage at 25°C, 40°C & 45°C for at least 3 month,
at 5°C & 50°C for 1 month, 3 x (-15°C to 25°C) freeze thaw cycles

Emulsifier	Stability	Observation
ECOHANCE® Care PS3	✓	No instabilities for > 6 month
Cetearyl Olivatate and Sorbitan Olivatate	✗	water separation after 3 month at 45°C
PEG-100 stearate, Glyceryl stearate	✗	water separation after 1 month at 45°C

ECOHANCE® Care PS3 stabilizes efficiently emulsions at only 2% usage concentration.

In vivo Short-term Moisturization Test

ECOHANCE® Care PS3 vs. benchmarks

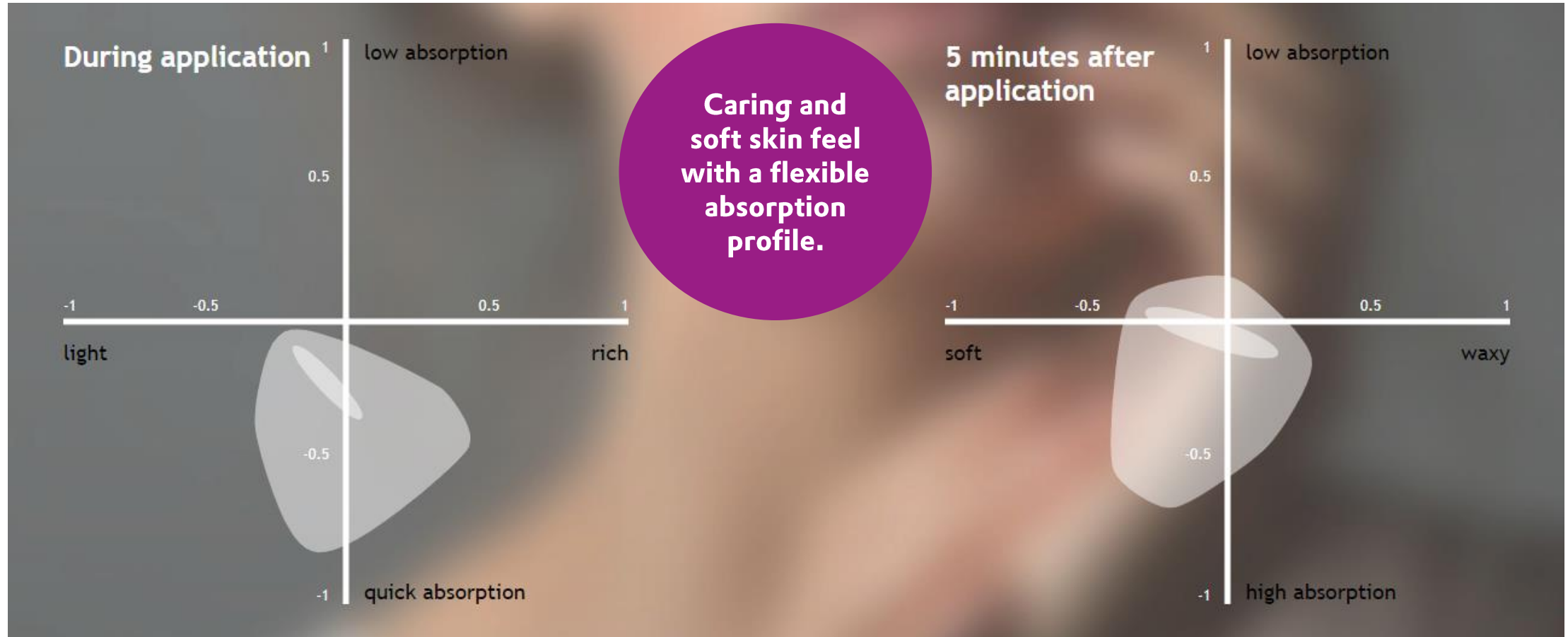


ECOHANCE® Care PS3 provides moisturization properties!

Test design

Test formulation:	Control (untreated) + 3 identical O/W emulsions stabilized with different emulsifiers
Number of panelists:	16
Test area:	Inner forearm
Amount of test formulation:	20 µg (4 µg/cm ²)
Measurement:	Corneometer CM 825 (an increase of Corneometer units (CU) indicates moisturizing properties)
Time points:	Start and 2h after application

Sensory Profile of ECOHANCE® Care PS3



Remark: If you are interested in formulation details, pls check our website via intoBeauty.evonik.com

How to Formulate ECOHANCE® Care PS3?

Formulation Frame

Application texture	Oil phase	ECOHANCE® Care PS3	Consistency enhancer ⁽¹⁾	Thickener ⁽²⁾
Lotions	15 – 25%	2.0 – 3.0%	0.2 – 1.5%	0.3 – 0.5% Xanthan Gum
Creams	20 – 35%	3.0 – 4.0%	1.5 – 2.5%	0.1 – 0.5% Xanthan Gum
Butters	25 – 35%	3.0 – 5.0%	5.0 – 8.0%	0.1 – 0.5% Xanthan Gum

⁽¹⁾TEGIN® M Pellets (Glyceryl stearate) / TEGO® Alkanol 1618 (Cetearyl alcohol).
⁽²⁾Xanthan Gum: e.g. Keltrol CG-SFT (CP Kelco).



Natural oils?
No problem!

Ideal for
natural
cosmetics!

JOIN US ON OUR **SUSTAINABLE BEAUTY JOURNEY**

WITH

ECOHANCE® CARE PS3

BASED ON
OLIVE OIL
RESIDUES



ZERO
LAND-USE
CHANGE



NO
COMPETITION
TO FOOD



CARBON
FOOTPRINT
OPTIMIZED



FOR NATURAL
O/W LOTIONS &
CREAMS



ECOHANCE[®] Care PS3

Next Generation Solution Emulsifier



Bottle your sustainability goals – Minimize your environmental footprint with our emollients

April 2022



Environmental benefits



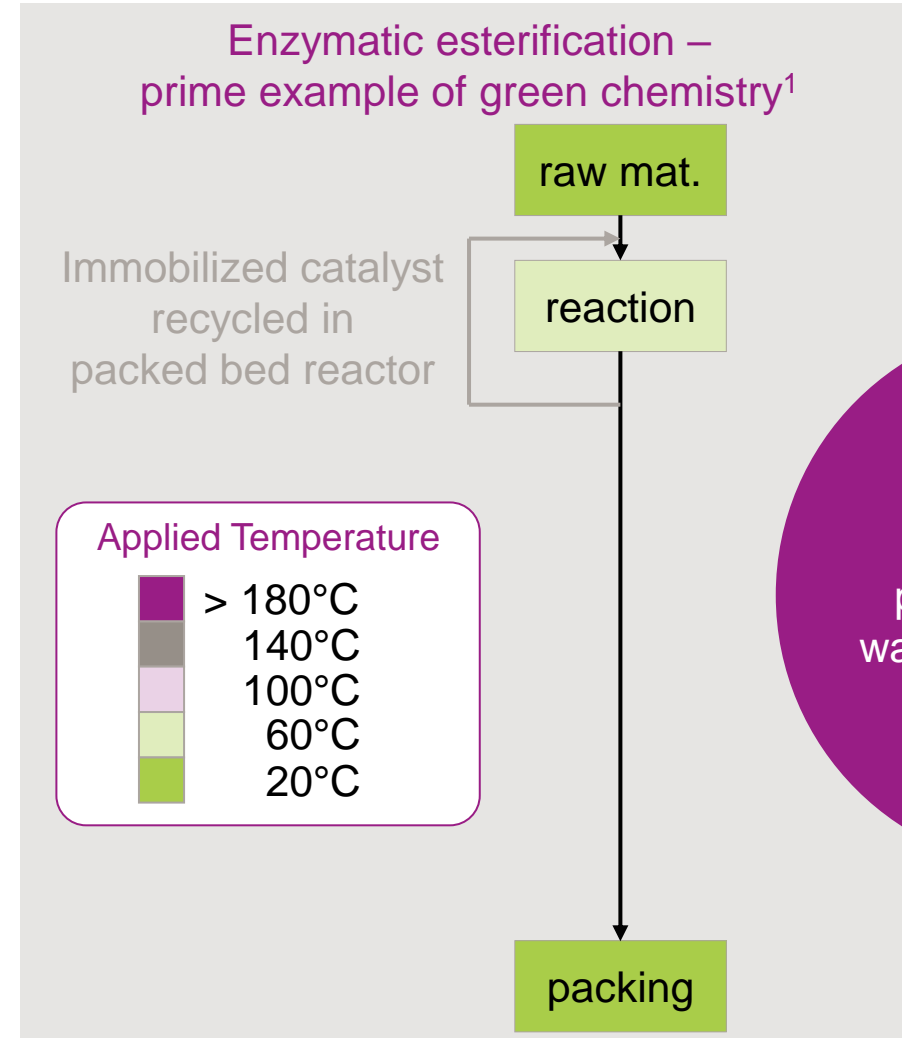
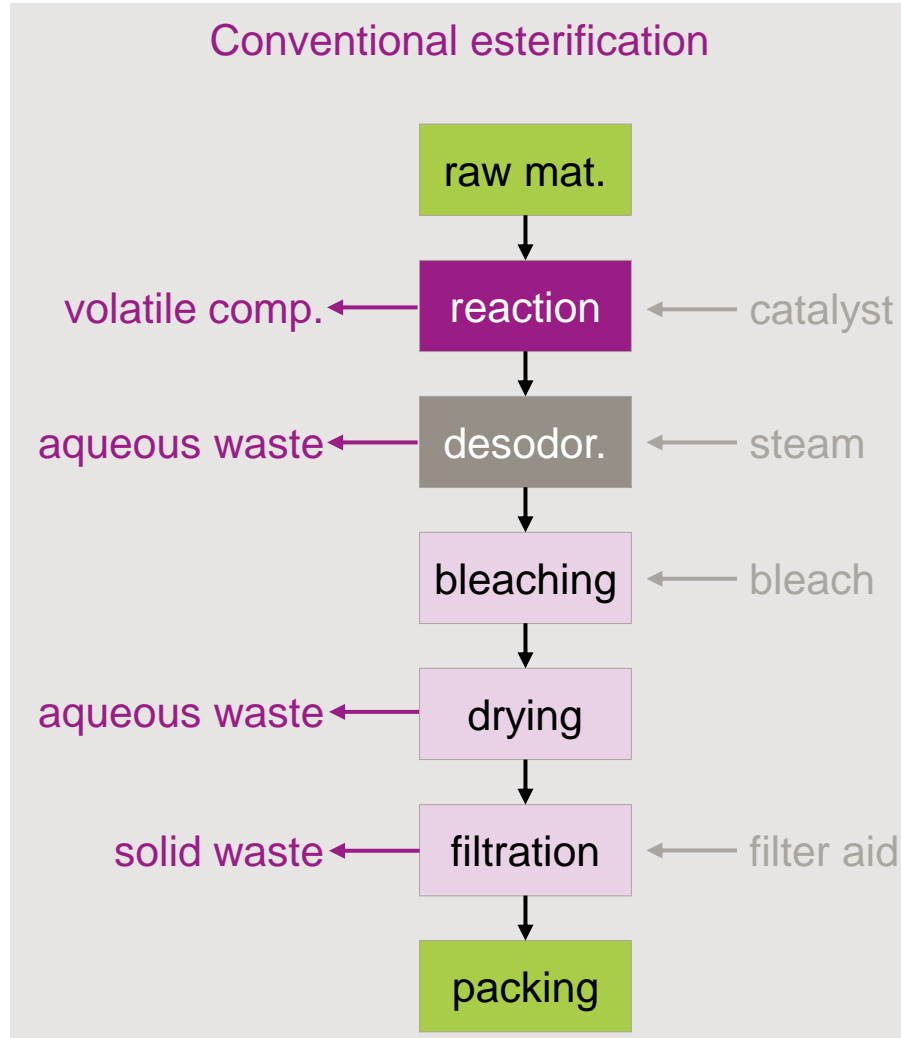
A unique green chemistry process



Impact of your final formulation



Process comparison of conventional esterification vs. enzymatic production of emollient esters



¹ see green chemistry info

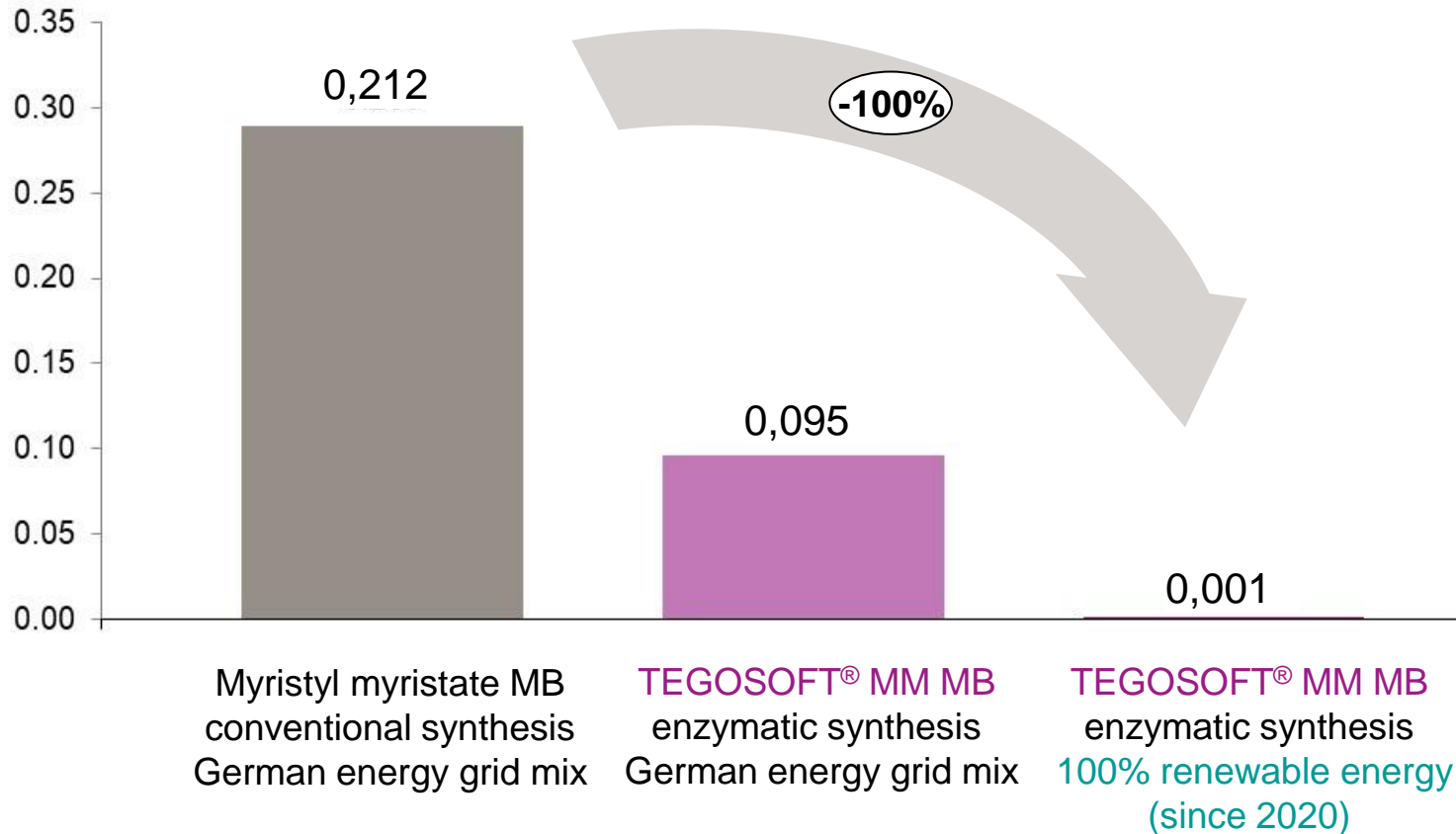
The enzymatic production process prevents waste and uses less energy.

The enzymatic esterification process reduces CO₂ emissions

Life cycle assessment based on Myristyl Myristate – gate to gate



kg CO₂ equivalents per kg emollient



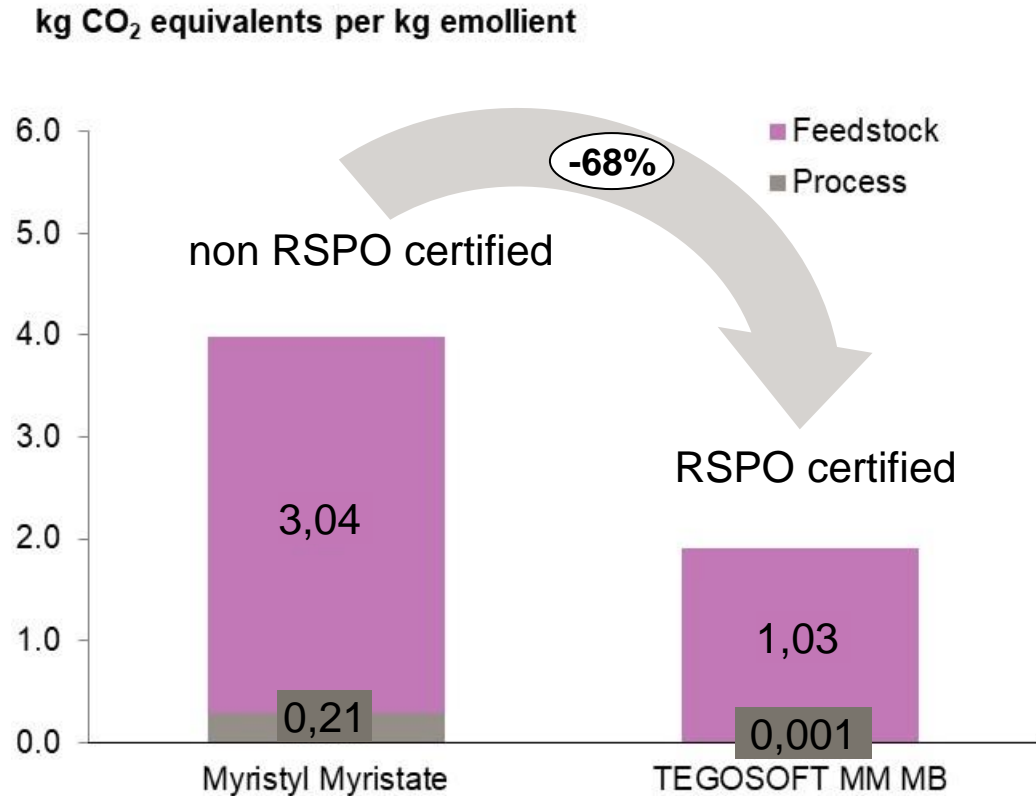
Global warming potential including biogenic carbon and land use change

» see LCA background info

This eco-efficient process fully running on renewable energy leads to an improved impact on global warming by 100% lower CO₂ footprint compared to conventional chemical production

The enzymatic esterification process uses RSPO certified raw materials

Life cycle assessment based on Myristyl Myristate



Global warming potential including biogenic carbon and land use change, exemplary for TEGOSOFT® MM MB¹

Process: gate to gate

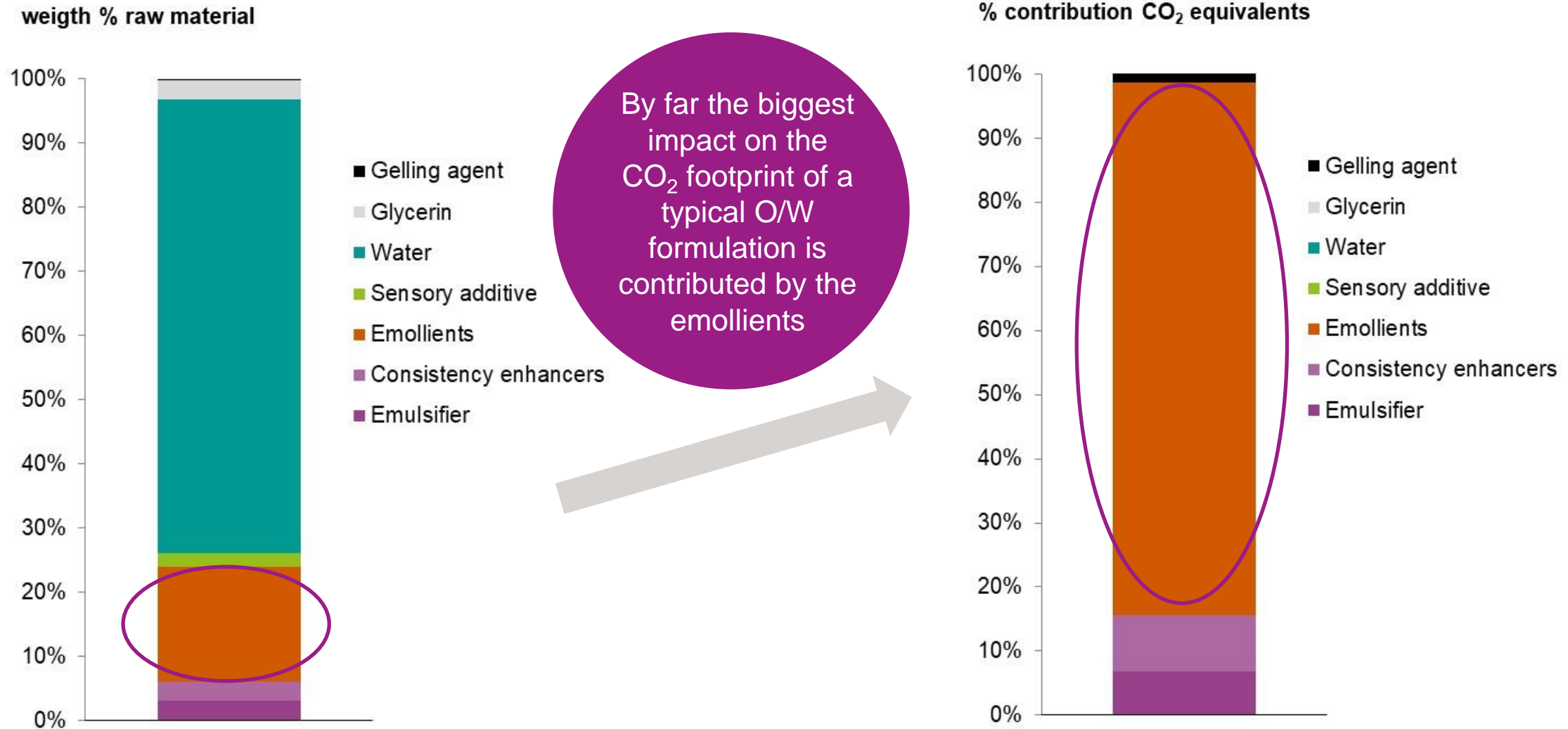
Feedstock: cradle to gate

» see LCA background info

TEGOSOFT® MM MB has an improved impact on global warming by 68% lower CO₂ footprint compared to conventional chemical production & non RSPO certified feedstock

Environmental impact of a market product

Life Cycle Assessment of a typical O/W cream - Impact of ingredient types



Environmental impact of your market product

Typical O/W cream - example



Phase	Ingredients	w/w %
A	dermofeel® NC MB (Polyglyceryl-3 Distearate, Glyceryl Stearate Citrate)	3.00
	TEGIN® M Pellets MB (Glyceryl Stearate)	2.00
	TEGO® Alkanol 1618 MB (Cetearyl Alcohol)	1.00
	Isoamyl Laurate	5.00
	Decyl Cocoate	5.00
	Oleyl Erucate	5.00
	Cetyl Ricinoleate	3.00
	TEGO® Feel C 10 (Cellulose)	2.00
B	Water	70.80
	Glycerin	3.00
	Xanthan Gum	0.20
C	Preservative, Perfume	q.s.



Test formulations

- natural origin content (incl. water, ISO 16128) c_{no} : 100.0%
- Skin care emulsion with **conventional esters**
- Skin care emulsion with **Evonik enzymatic esters**

Exchanging



emollients
(18%)

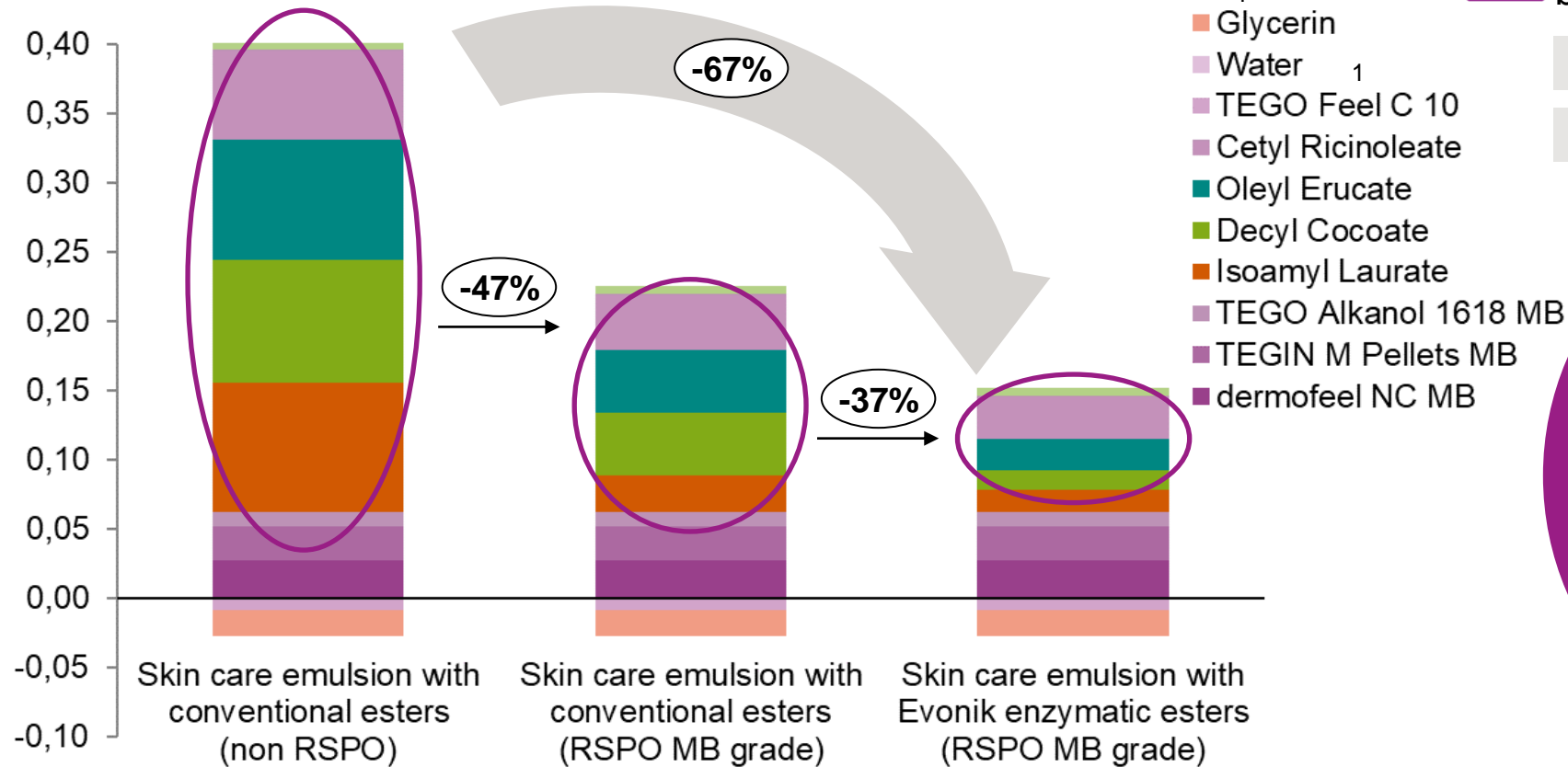
dermofeel® sensolv MB (Isoamyl Laurate)	5.00
TEGOSOFT® DC MB (Decyl Cocoate)	5.00
TEGOSOFT® OER MB (Oleyl Erucate)	5.00
TEGOSOFT® CR MB (Cetyl Ricinoleate)	3.00

Environmental impact of your market product

Life Cycle Assessment of a typical O/W cream – cradle to gate



kg CO₂ equivalents per kg emulsion



Global warming potential including biogenic carbon and land use change

» see LCA background info

¹ see further explanation

By changing to Evonik enzymatic emollients in the final formulation an improved impact on global warming by 67% lower CO₂ footprint compared to using conventional chemical emollients is possible



Overview

Summary of recommended emollients for different applications

Product name	INCI	Anti-perspirant/Deo	Color cosmetics	Face & body care	Hair care	Natural care	Sun care
dermofeel® sensolv MB	Isoamyl Laurate	○	○	○	●	●	●
TEGOSOFT® AC MB	Isoamyl Cocoate	○	●	○		●	○
TEGOSOFT® CR MB	Cetyl Ricinoleate		●	○		●	
TEGOSOFT® DC MB	Decyl Cocoate		●	○		●	●
TEGOSOFT® LO MB	Lauryl Oleate	○	●	●	●	●	
TEGOSOFT® MM MB	Myristyl Myristate		●	○		●	
TEGOSOFT® OER MB	Oleyl Erucate	●	○	○		●	

○ Recommendation

● Special recommendation



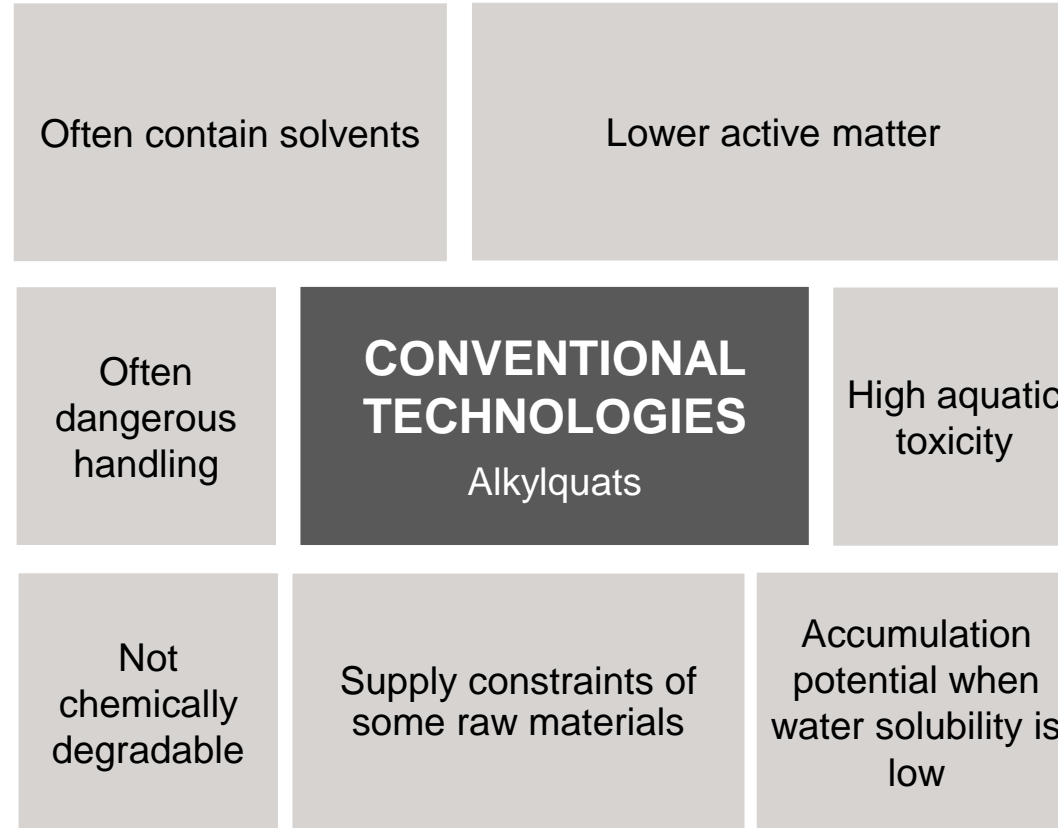
TAKE A STEP INTO SUSTAINABLE HAIR CONDITIONING

VARISOFT® EQ 90

February 2023 | Cosmetic Solutions

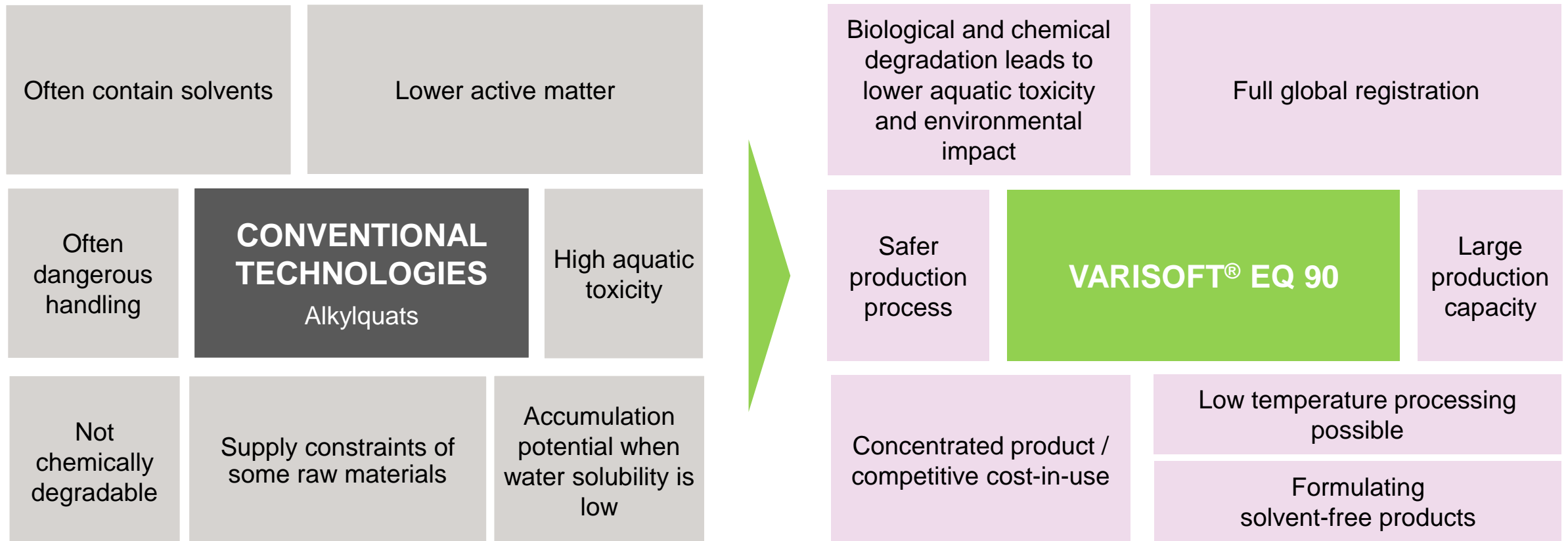
The Evolution of Hair Conditioning

Esterquat technology brings meaningful progress to sustainability in hair care



The Evolution of Hair Conditioning

Existing Technologies – New VARISOFT® EQ 90



VARISOFT® EQ 90

Properties and advantages

PROPERTIES	HIGHLIGHTS
INCI name: Dioleoyl ethyl Hydroxyethylmonium Methosulfate	Very good conditioning properties
Viscous liquid, cold processable	Excellent cost/performance
Not based on tropical oils	Emulsifying properties for fatty alcohols
100% active matter, solvent-free	APPLICATIONS
Readily biodegradable ¹⁾	
Vegan ²⁾	
CFDA: yes	
Halal: yes	
Natural origin index (ISO 16128) $I_{no} = 0.70$	Conditioning shampoos
	Conditioners and masks
	Leave-in sprays
	Solid formats


1) Cross read, OECD 301 A-F

2) "vegan" means, the product is free from animal derived materials



Evonik Portfolio of Readily Biodegradable Esterquats

A closer look

	Composition	Form	Processing temperature	Main benefits	Hydrolytic stability ³⁾	Conditioning performance	Application	Extra
VARISOFT® EQ 100 Bis-(Isostearoyl/Oleoyl Isopropyl) Dimonium Methosulfate	100% active	liquid	cold	Excellent conditioning performance; easy to process	●●●	●●● superior to BTAC ²⁾	Universal: rinse, shampoo, spray	<ul style="list-style-type: none"> Not based on palm oil Thickening benefit in shampoos CFDA registration in progress
VARISOFT® EQ 90  Dioleoylethyl Hydroxyethylmonium Methosulfate	100% active	Viscous liquid	Cold/40 °C	(Very) good conditioning performance; easy to process	●	●● comparable to BTAC ²⁾	Conditioner rinse, shampoo (limited), spray	<ul style="list-style-type: none"> Not based on palm oil CFDA registered Excellent cost/performance
VARISOFT® EQ 65 MB Distearoylethyl Dimonium Chloride; Cetearyl Alcohol	~65% Diesterquat, ~35% Cetearyl Alcohol	pellets	~80°C	Good conditioning performance; excellent emulsification of fatty alcohol	●●	●● comparable to BTAC ²⁾	Conditioner rinse, spray	<ul style="list-style-type: none"> COSMOS certificate for hair care applications CFDA registered Provides rich and creamy texture
VARISOFT® EQ F 75 MB Distearoylethyl Hydroxyethylmonium Methosulfate; Cetearyl Alcohol	~70% Mixture of mono-, di- and triesterquat, ~30% Cetearyl Alcohol	pellets	~65°C	Efficient cost performance; emulsification of fatty alcohol	●	● comparable to CTAC ¹⁾	Conditioner rinse	<ul style="list-style-type: none"> CFDA registered Easy to process

¹⁾ CTAC = Cetrimonium Chloride ²⁾ BTAC = Behentrimonium Chloride ³⁾ for hot and humid climates, the use of an esterquat with at least ●● is recommended, or combinations

