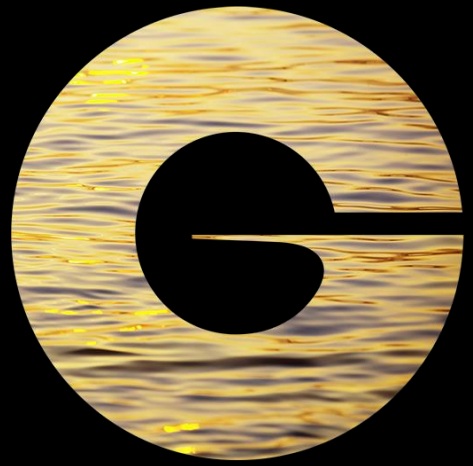
Industrial bio-production for the cosmetic business: Stakes and position for France.

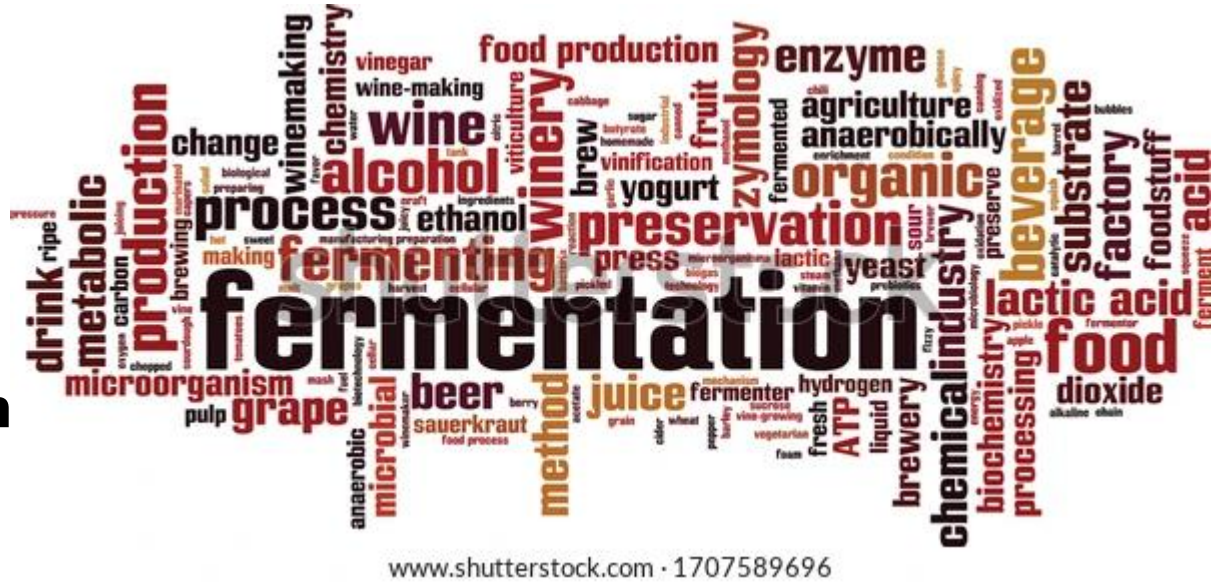
Alexis Rannou Head of Operations Strategy



Givaudan

engage your senses

Agenda



1. **Givaudan => short Presentation**
2. **White biotech definition**
3. **Why biotech for cosmetic**
4. **Our need to implement new biotech factories**
5. **The cosmetic & biotech network**
6. **Conclusion**

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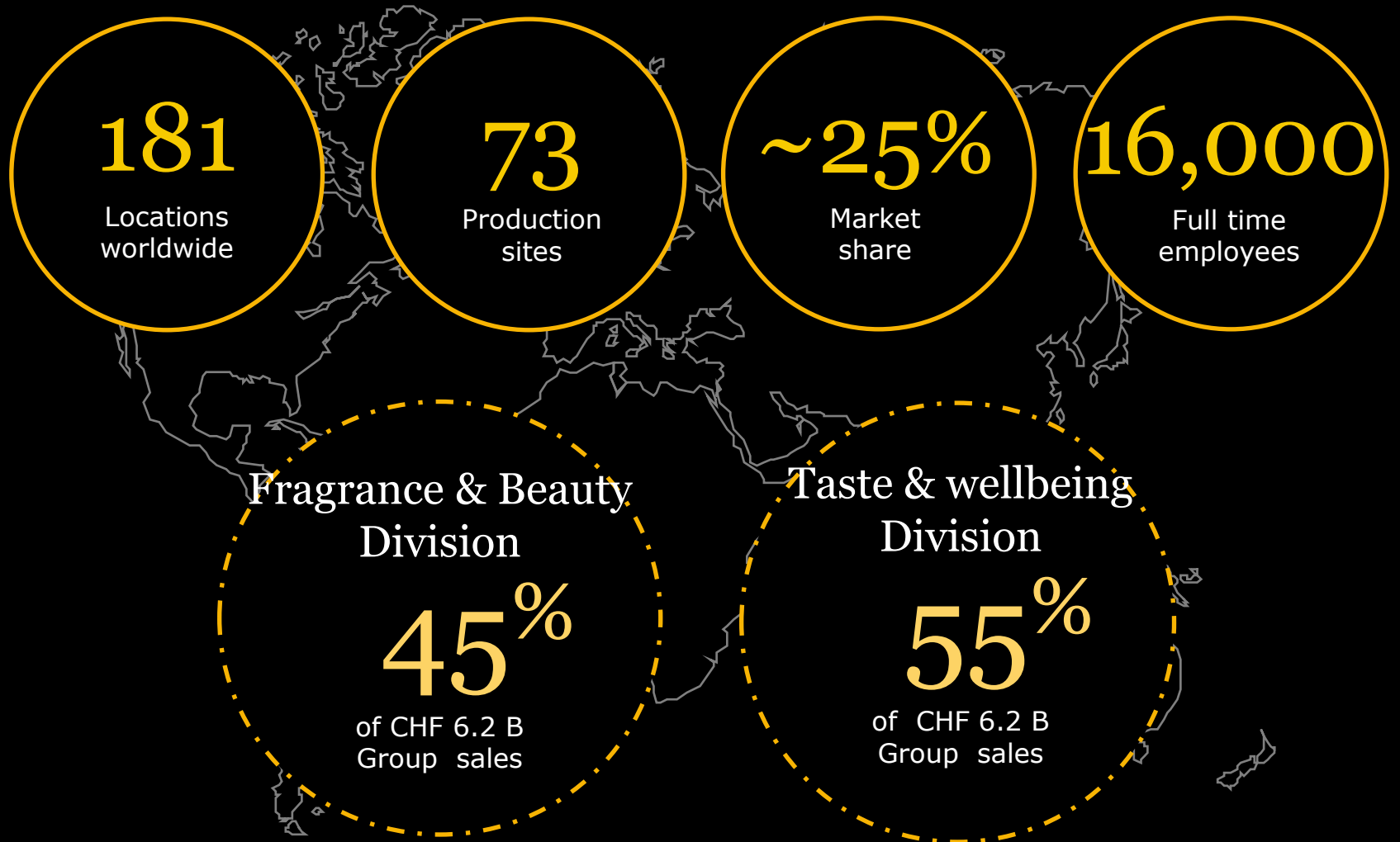
The leading F&F company



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Centres of Expertise in EU with a leadership in Biotech

Combining different skills to offer the best

BLUE BIOTECHNOLOGY
Centre of Excellence
Île Grande (France)
- Blue technology
- Sea water Aquifer

Alderys
strain engeneering
Orsay (France)
- R&D

WHITE BIOTECHNOLOGY
Centre of Excellence
Pomacle (France)
- Operations / PRD
- Fermentation
- Skin Expertise Technical Centre (Biocell. & *in vivo* Lab.)
- Formulation Lab.

APPLIED MICROBIOMICS
Centre of Excellence
Toulouse (France)
- Biocatalysis Lab.
- Metagenomic Lab.
- Consumer Insights

Vegan polypeptides
Centre of Research
Munich (Germany)
- R&D
- Formulation Lab.

VISUALS & VECTORISED
Centre of Excellence
Volketswil (Switzerland)
- Operations
- Visual carriers
- Spherulite™ development

GREEN FRACTIONATION
Centre of Excellence
Avignon (France)
- Operations
- Green Fractionation
- Formulation Lab.

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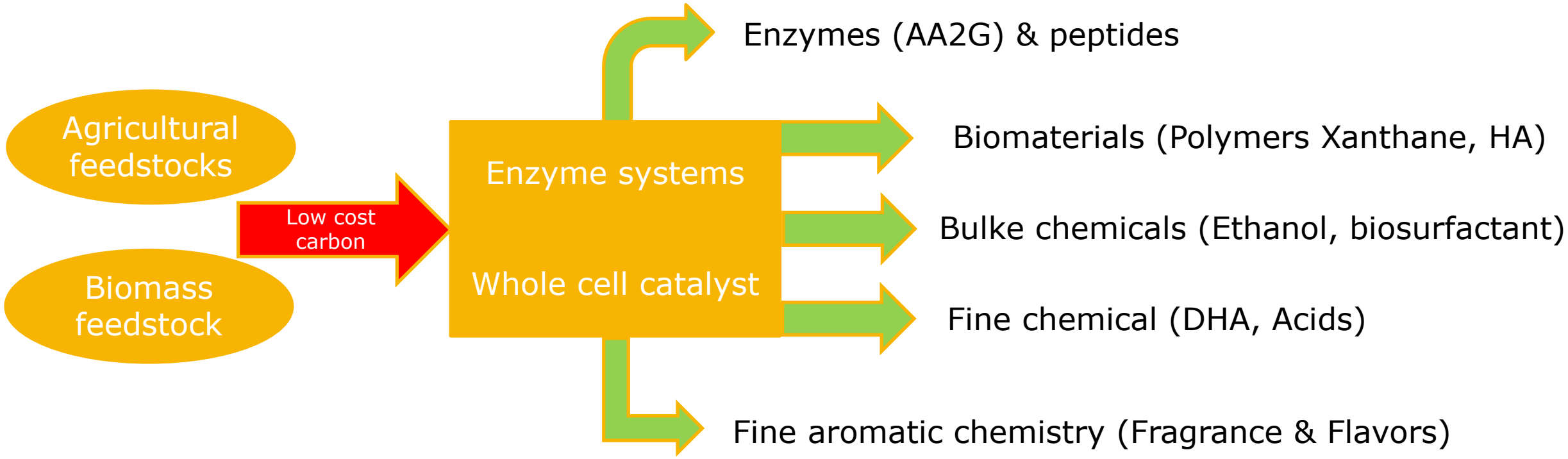
Fermentation and cosmetic industry

White biotech

White biotech

- Using biological system to produce chemicals molecules through biocatalyst (enzyme) or fermentation (micro-organism) with renewable ressources



Why white biotech for cosmetic application

- Replacement of animal derivatives
- Using renewable ressources with a lower cost carbon
- Naturality
- Specificity of strain able to produce pure molecules
- Chemistry image
- Supply chain less dependent on climate or cost variation
- Stable process as using standard raw material
- Large capability to answer to the market thanks to strain engeneering

Why Biotech ?

- Mostly biodegradable products
- Less toxic
- Pure molecule
- Local and sustainability
- Main hybride development using the best of the 2 technologies (Biotech & Green Chemistry)

Our needs for industrial biotech

- Availability of Raw material such as carbohydrates
- Know how of people
- Underground water (hydric stress to manage)
- Energy (Cost & availability)
- Waste water treatment
- Clear regulation (GMO, By products etc…)
- Efficient logistic (international Hub)
- Taxes & customs regulations (stable)

Why France could fit with our needs

- First agricultural producer in EU (Wheat, Sugar beet…)
- First producer of carbohydrate in EU (Cristal union, Tereos, ADM, Roquettes etc..)
- Energy available and competitive (electricity with a low CO2 emission)
- High level of knowledge through education
- In the EU regulation
- Central position in EU for logistic with international Hub
- World center of excellence in the cosmetic research and production
- « Crédit Impôt recherche » helping R&D + Process development (cost saving)
- Scale up environement with CMO such ARD, Pivert, + Toulouse white biotech institute

Gap assessment vs foreign countries in the world

- Lower capex cost in India & China (Dumping ?)
- Lower labour cost
- Administratives delays
- Raw material cost vs LATAM & US
- EHS regulation

Industriel fermentation for Cosmetic application

Very active French network

- => Givaudan, Silab, Solabia, Codif, Sederma =>industries are using white biotech since years

- => Deinove with greentech (Hebelys shingomonas)
- => Global bioenergy with L'Oréal=> Isododecane, Isohexadecane (ARD as CMO)
- => METEX=>Acide Glycolique, 1.3 PDO …
- => AFYREN with carboxylic acids(2012)
- => Fermentalg mixotrophic microalguous (AG-PUFA, Natural colorant)

Industriel fermentation for Cosmetic application

From R&D to consumers

=> Report « Stratégie nationale de bio-production » in France emphasizes the french excellence in R&D + internationals groups implanted in France using fermentation (Lesaffres, Roquettes, Givaudan, Lallemand, Hansen, Danisco, DSM).

World Leadership in the cosmetic world with a very nice image of the made in France

L'Oréal, LVMH, Clarins, Chanel, Yves Rocher, l'Occitane, Sisley, Eugène Perma etc..

- Sustainability becoming a must to have => France with a very good positionning (less greenhouse gas emission) with LCA analysis and companies developping soft tools (EVEA, Quantis etc…)

Conclusion

France have a fantastic opportunity to stay ahead in the bio-production for cosmetic ingredients with:

A clear worldwide leadership in the cosmetic world

A strong network with an R&D know-how

A leadership on the sustainability

A local sourcing in carbohydrate

A structuration to develop industrial metabolism with recycling, upcycling and using renewable energy

=> Of couse we need to help global companies to invest in France assisting them in administratives tasks and with capex investment support.

Exemple of the Bazancourt-Pomacle biorefinery
For a sustainable industrial metabolism

ARD : Private research center
Wheatoléo : Biobased surfactant

Cristal Union
Sugar refinery

Cristanol
1st generation distillery

ADM
Glucosery
Starch

Vivescia

Ficap energy producer from wood

Air liquide

CEBB
Public research center
AgroParisTech · CentraleSupélec · NEOMA Business School · Université de Reims Champagne-Ardenne

Givaudan Active Beauty
Biobased cosmetics

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Thank you

Questions ?

Alexis RANNOU
Alexis.rannou@givaudan.com