Global Bioenergies

A growing player of the environmental transition

March 2023

Disclaimer

This presentation contains certain forward-looking statements that have been based on current expectations about future acts, events and circumstances. These forward-looking statements are, however, subject to risks, uncertainties and assumptions that could cause those acts, events and circumstances to differ materially from the expectations described in such forward-looking statements.

These factors include, among other things, commercial, technical and other risks e.g. associated with estimation of the price of carbohydrate resources, the meeting of development objectives and other investment considerations, as well as other matters not yet known to the Company or not currently considered material by the Company.

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GBE at a glance

Our Company

- ✓ Founded in 2008
- ✓ ~50 employees in the Paris area
- ✓ IPO in 2011 - listed on Euronext Growth

Our Technology

- ✓ A unique & disruptive gaseous fermentation process
- ✓ synthetic biology x green chemistry = deeptech
- ✓ Aim to significantly contribute to cutting CO_2 emissions
- ✓ First commercial plant up and running since S2 2022

Our Purpose

'To foster the environmental transition through biosciences'

Our Products

First renewable isobutene and derivatives

Key molecules for cosmetics

At the core of the transition to sustainable cosmetics

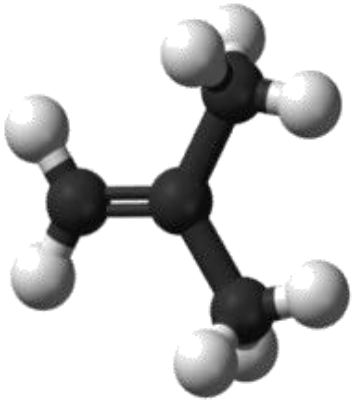
Partnership with L'Oréal

Sustainable fuels

Drop-in biofuels for road and air transportation

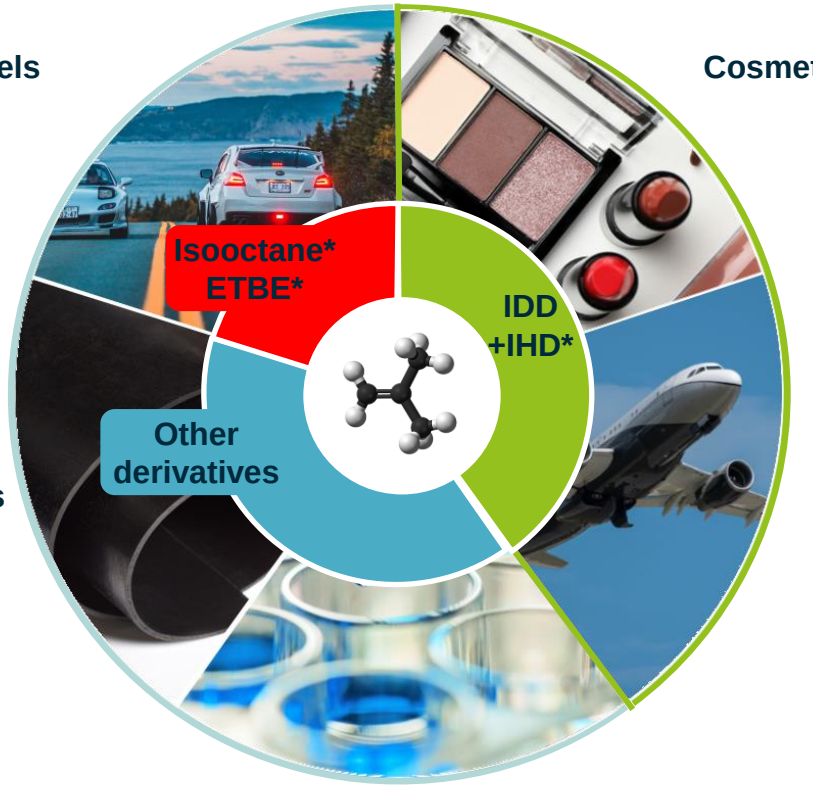
ASTM certification in progress for Sustainable Aviation Fuels
Partnership with Shell on low-carbon road fuels

Why Isobutene?



- The smallest branched carbon structure (4 carbons, gaseous)
- A double bond allowing the conversion of isobutene into numerous high-performance compounds: octane rating for gasoline; air tightness for elastomers; volatility for cosmetic oils…
- These performances directly rely on isobutene, and isobutene is not produced in Nature → our process is the only way to access these performances in a sustainable way

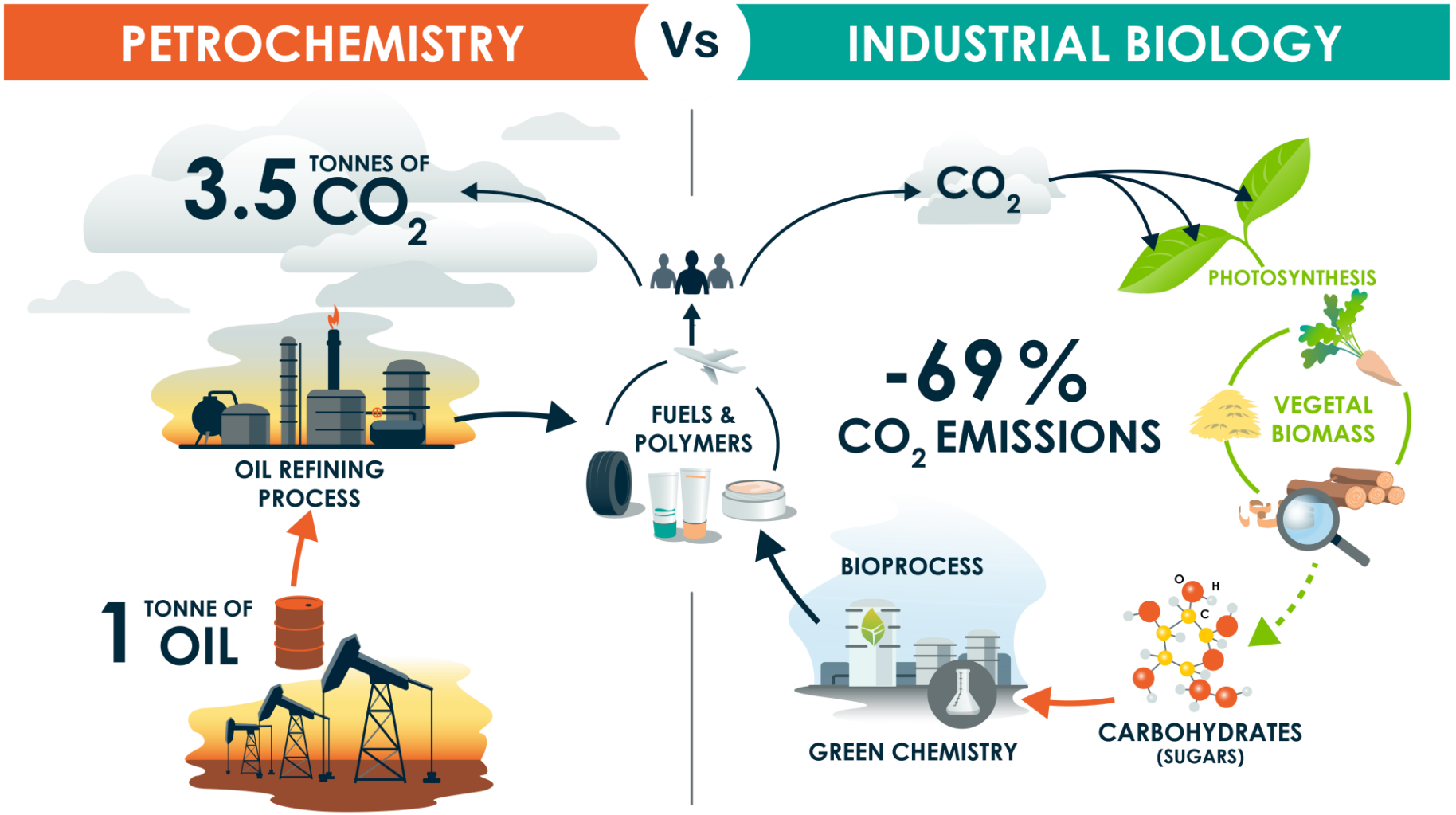
Isobutene product tree (simplified)



Whole market:
15 million tons per year
isobutene produced from oil

* IDD, or isododecane, is obtained by combining isobutene molecules 3 by 3
IHD, or isohexadecane, is obtained by combinig isobutene molecules 4 by 4
Isooctane is obtained by combining isobutene molecules 2 by 2
ETBE is obtained by combining isobutene with ethanol

Industrial biology is a way to decarbonisation



Our commitment: contributing to keeping the world livable

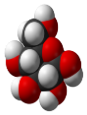
- We aim at becoming an example for a sustainable industry
- Started the Gaïa notation:
  - in 2021: score of 40/100, average within the companies in the same sector
  - in 2022: score of 56/100, above the average of 43/100 for companies with revenues inferior to €150m
- One full-time ESG manager driving progress and objectives



A disruptive technology to impact the planet

A disruptive way to avoid petrochemistry

GBE's bio-sourced process



Residual sugars

Bacterial fermentation

Global Bioenergies

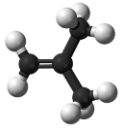
GBE's unique technology protected by 45 patent families

VS.

Current widespread process

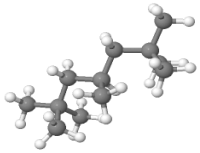
Oil

Steam cracking



Isobutene (IBN)

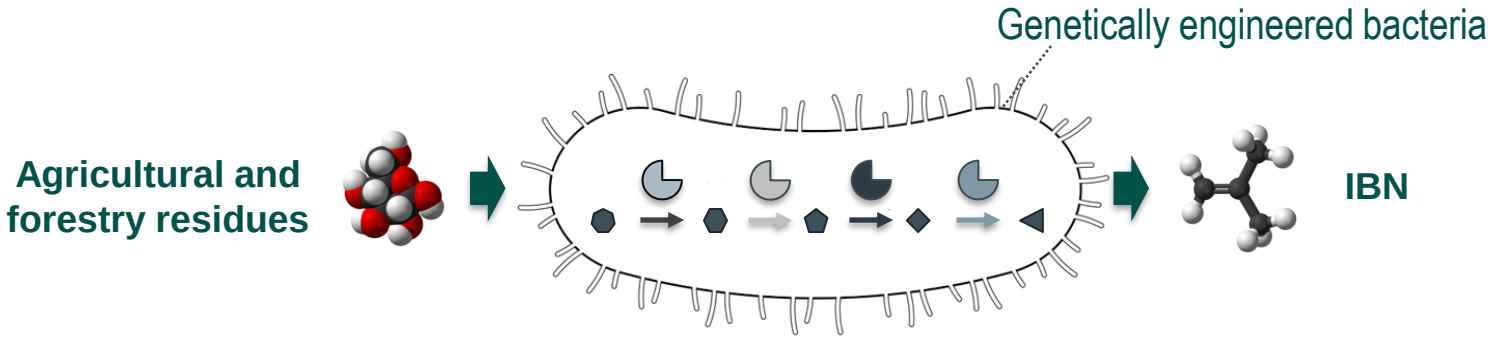
Green chemistry



Isododecane (IDD) and other derivatives (IHD, isooctane, ETBE...)

Unique Science

- Engineering bacteria by implementing a metabolic pathway to IBN



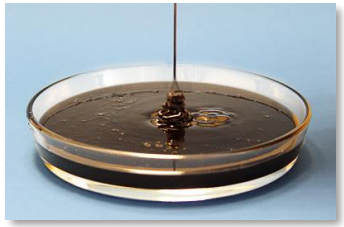
- No biological starting point because IBN is not produced by Nature

  → We created **a unique artificial metabolic pathway** - huge technology barrier overcome

- Global Bioenergies developed **the first ever fermentation process to a gas**, with solid advantages translating in economics

Conventional resources

1st generation: beet sugar residues



- ✓ Residue: natural and inevitable coproducts in the production process
- ✓ No food (nor feed) application
- ✓ No need for additional land
- ✓ Potential for high GHG emission savings

- Well established industry
- Available volumes sufficient for the cosmetics and specialty chemicals markets
- CO_2 savings if compared to fossil ~ 65%

French beet production:
40 mt

↓

16% sugars:
6 mt

↓

11% non extractable sugars: 650 kt

Emerging resources

2nd generation feedstocks: wood residues and straw

- Wood chips from sawmills, wheat straw…
- Proven compatibility with GBE technology
- New, emerging industries: first plants just starting their operations
- Accessible volumes in future: several thousands of million tons, enough to cover all Sustainable Aviation Fuels needs
- CO_2 savings: 80% if compared to fossil

→ Clariant & Fibenol both partners of Global Bioenergies since 2018 through EU-funded projects:

Fibenol

Sugar capacity: 20 kt/y
Start of operation: Q1 2023
Location: Estonia

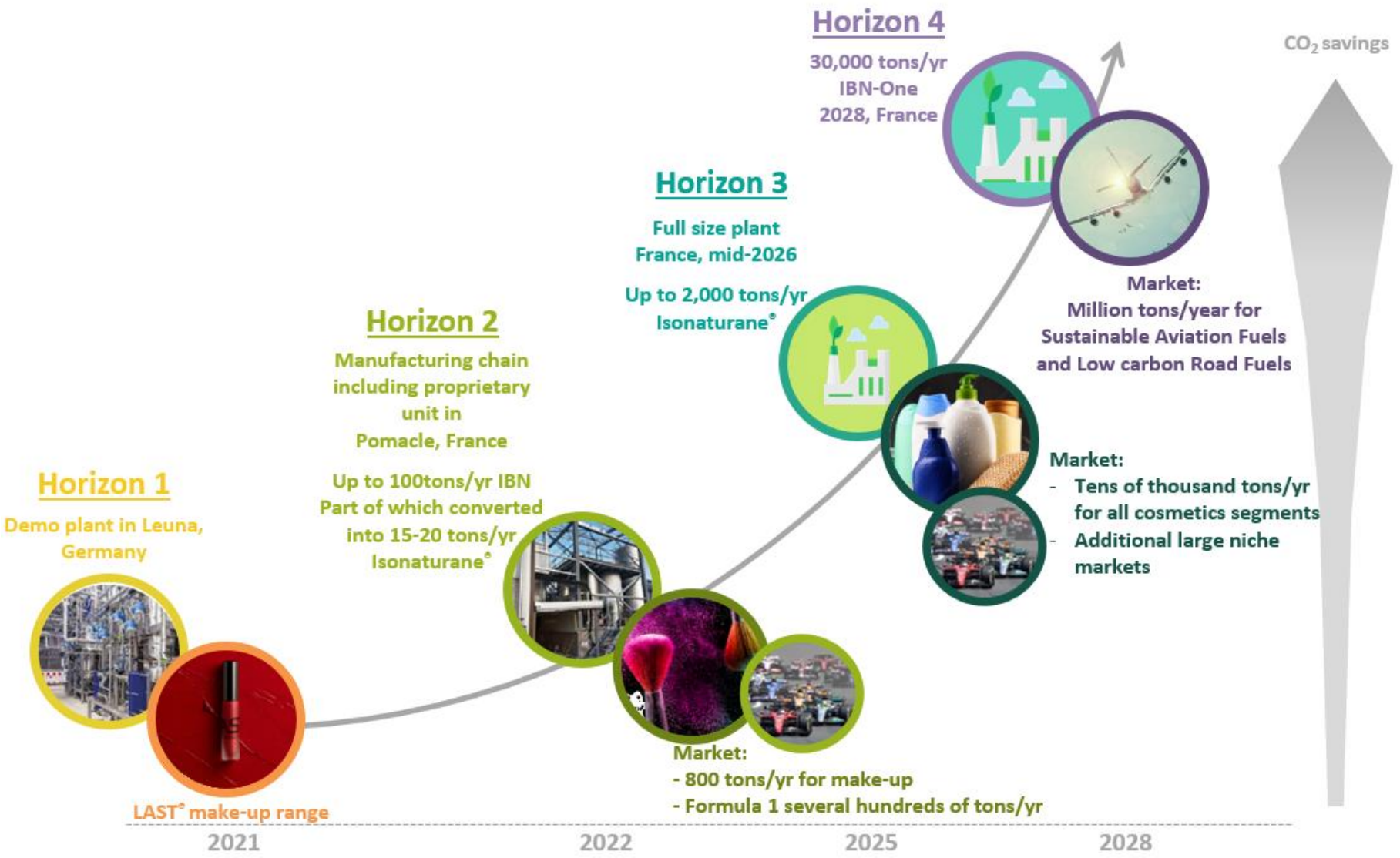
Clariant

Sugar capacity: 100 kt/y
Start of operation: mid-2022
Location: Romania

Step by step roadmap

Roadmap: 4 horizons

Global Bioenergies



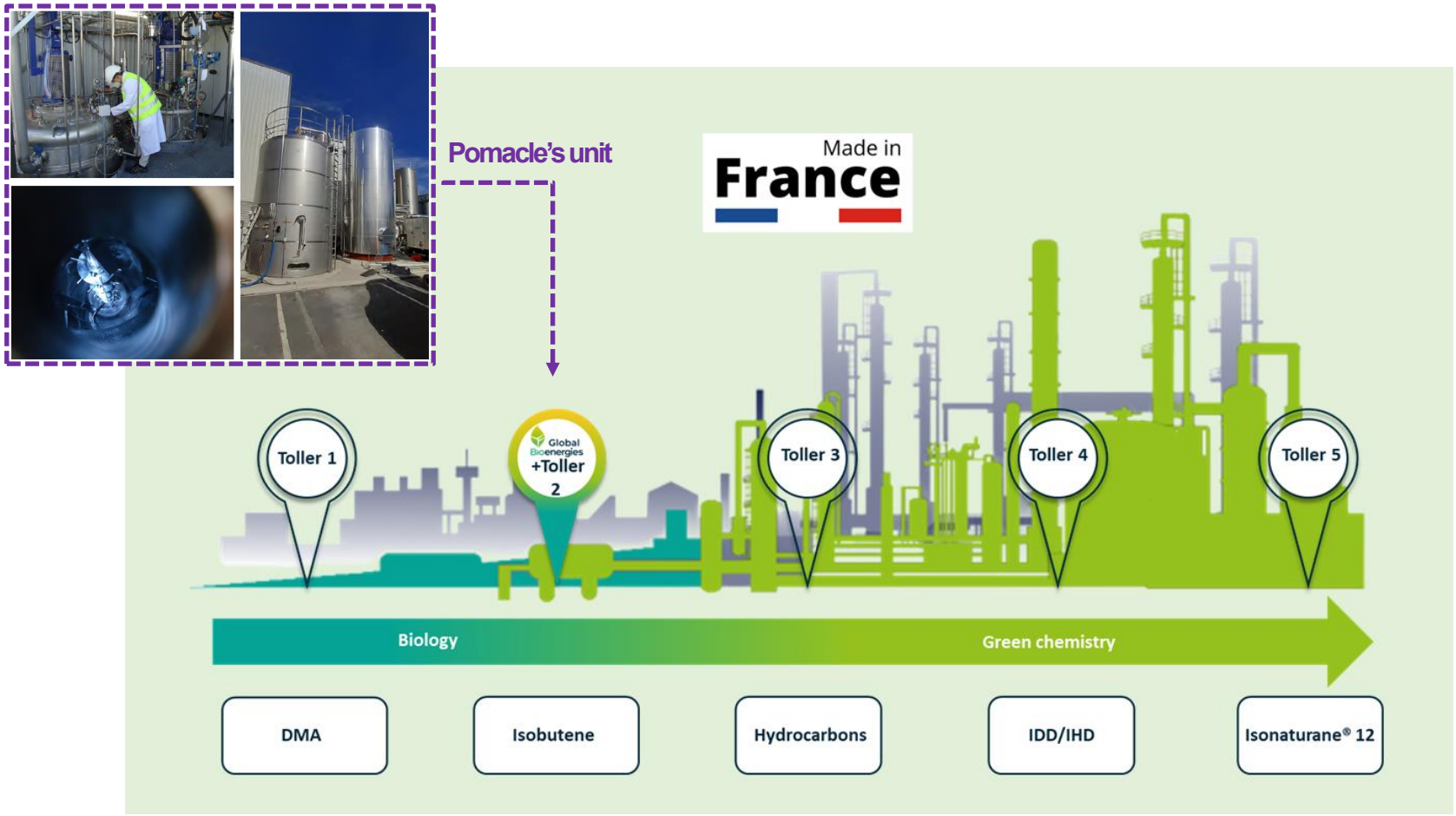
H1: First tons - proprietary make-up brand

LAST® → *From Biotech to Beauty*

- **IDD is the key, indispensable molecule in longwear make-up:** being the first ingredient in proportion (25-50%), it is the universal formulation basis for eyes and lips make-up
- It is also massively used in face make-up products (foundation…)
- We produce the first ever bio-sourced IDD → Unique Selling Proposition: for the first time, possibility to combine naturalness with longwear/waterproof/no-transfer performances
- Moving up the value chain and launching LAST® in summer 2021 (www.colors-that-last.com) allowed us to:
  - Qualify our raw material (regulatory…)
  - Prove the high naturalness / high performance market at scale

→ Strenghtened negotiating position in preparation for Horizon 2

H2: A complete manufacturing chain



- Set-up of a complete commercial manufacturing chain in 2022
- 5 tollers + a proprietary unit built and commissionned at Toller 2 facilities in Pomacle, close to Reims

H2: First niche market - Isonaturane® 12 for make-up

- First aim: producing IBN and converting it into cosmetic-grade IDD
- IDD to be sold under brand name Isonaturane® 12:
  - Regulatory work completed
  - First large order signed by

L'ORÉAL

  - Several smaller orders signed with brand owners and CDMOs, getting prepared to scale up.
- Also: production of cosmetic-grade IHD, to be sold under brand name Isonaturane® 16

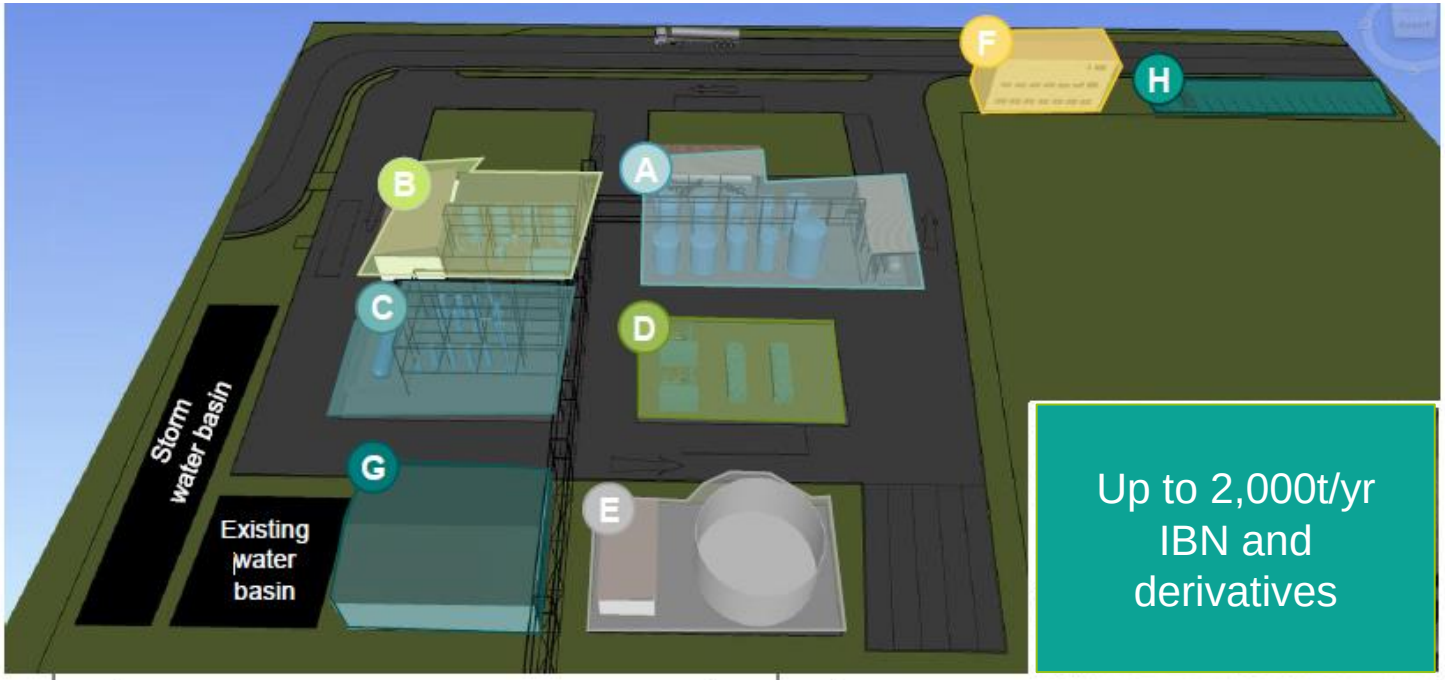
H2: Second niche market - Formula 1

- The FIA committed to ban fossil fuels in Formula 1 from the 2026 season on, and to run by then using 100% drop-in biofuels*
- Two bio-based IBN derivatives (isooctane and ETBE) are perfectly suited for such application
- The Horizon 2 manufacturing chain is at the right scale: tens of tons per year

GBE is in a unique position to harness the value from this Formula 1 2026 onwards opportunity

*: https://www.evo.co.uk/racing/203390/formula-1-confirms-use-of-100-percent-sustainable-fuel-from-2026

H3: Plant preliminary design



Up to 2,000t/yr IBN and derivatives

A	Storage tanks for chemicals (DMA, biomass, alkanes)	E	Fire pump room and fire reserve tank (1000 m^3)
B	3 bioconversion tanks to convert DMA into IBN + separation of IBN and CO_2 equipment	F	Corporate premises and offices
C	Storage of IBN + oligomerization and hydrogenation downstream steps	G	Maintenance, electrical and supervision rooms
D	Production of utilities (thermal oil, cooling water, compressed air, liquid nitrogen, hydrogen)	H	Parking and delivery zone

H3: Scale the volumes up in cosmetics

- Frost & Sullivan paid-for study:
  - → IDD and sister molecule IHD widely used in four of the five cosmetics segments: make-up, skincare, haircare, toiletries
  - → Market in tens of thousand tons per year
- Isonaturane® 12 launched during largest cosmetics fairs in Paris and Bangkok with >150 meetings in total:
  - → Brand owners
  - → CDMOs
  - → Distributors

in-cosmetics™ asia
Innovation Zone
Best Ingredient
Award 2022
SILVER WINNER
FUNCTIONAL CATEGORY

H3: Targeting larger niche markets

- Manufacturing cost to go down massively from H2, based on scale economies and increased integration
- Accessible volumes to increase accordingly
- Products to be manufactured and sold:
  - Isododecane sold under brand name Isonaturane® 12
  - Isohexadecane sold under brand name Isonaturane® 16
  - Isooctane and ETBE as octane boosters for motorsport, sold as Alkyso® iC8 and Alkyso® ETBE
  - Isobutene as an intermediate for fine chemicals, sold as Alkyso® IBN
- Commercial discussions ongoing with players in each of these different fields
- Target revenues >€80m at high margin rate due to unique selling propositions

H3: project update

- Up to 2,000 tons/yr IBN and derivatives
- Site pre-selected in France on existing industrial park
- Basic engineering completed
- Special Purpose Vehicle « ViaViridia » created
- Investment bank at work: Fundraising on ViaViridia targeted in Q2 2023 (equity + debt)
- Latest schedule from engineering company say production will start mid-2026

→ Will make GBE profitable

H4: Decarbonizing air transportation

- First flight performed in June 2021 with a small airplane using **97% GBE's aviation gasoline**

→ sends the message of our commitment to improving the sustainability of air transportation + performances of our molecules

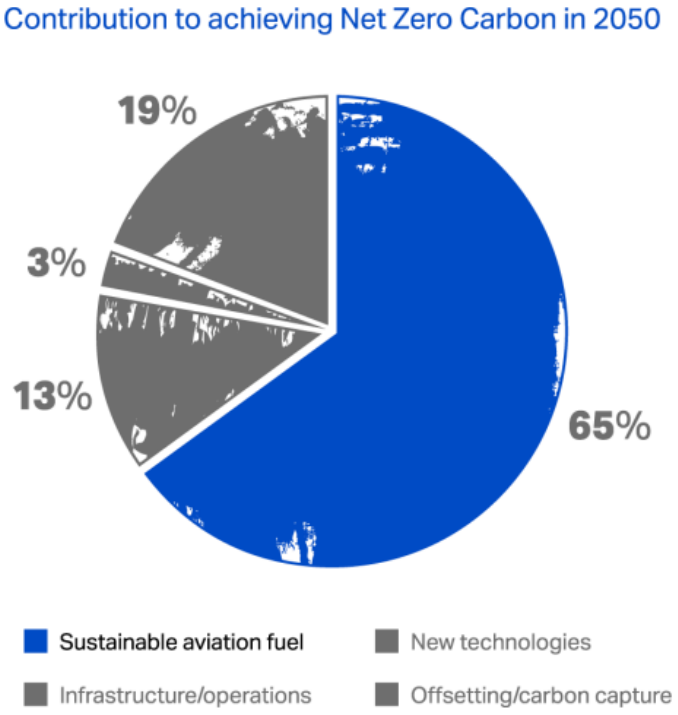
- IDD is already approved for a 50% blend in commercial jet fuel
- ASTM-certification on its way: balloting process started on February 27, 2023
- Objectives for renewable & sustainable jet fuel:
  - → Bring cost below 4€/kg (R&D efforts necessary)
  - → New Life Cycle Analysis to calculate CO_2 savings (and more)
  - → Prove reduction in particles emission → less contrails, that are also contributing to global warming
  - → 30kT SAF-centered plant in the second half of the decade

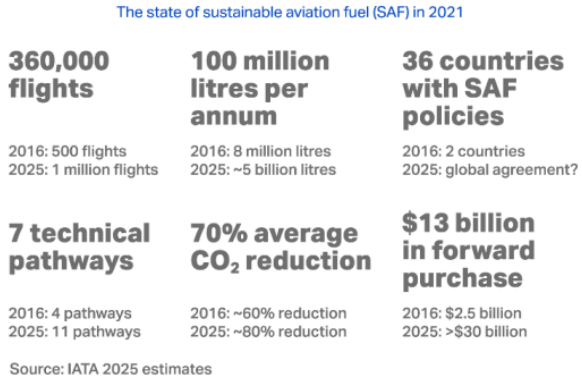
- Competition in SAF limited to 7 technologies for now, in a game just started and thus widely open

H4: IATA's view

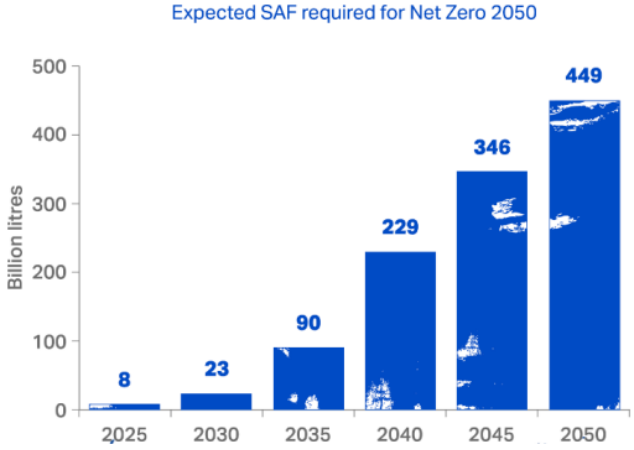
International Air Transport Association's view:

(*IATA is the trade association for the world's airlines, representing 290 airlines or 83% of total air traffic*)





« We estimate that SAF could contribute around 65% of the reduction in emissions needed by aviation to reach net-zero in 2050. This will require a massive increase in production (see chart below) in order to meet demand. The largest acceleration is expected in the 2030s as policy support becomes global, SAF becomes competitive with fossil kerosene, and credible offsets become scarcer. »



Source:
www.iata.org/contentassets/b3783d24c5834634af59148c718472bb/factsheet_saf-.pdf

Road biofuels

- Road biofuels were considered until recently as a dead case: the electric car would become core for road transportation, and thermal engines would be banned.
- Several arguments recently damaged this vision: dependency on China; effective CO_2 emissions of cars, batteries, and electricity; tensions on rare earth elements; shortages on electricity…
- Today, Europe is hesitating in its 100% electric 2035 plan*, and road biofuels are back. The continuation of thermal engines in Europe beyond 2035 seems linked to biofuels, which appear again as a part of the solution.
- Isobutene derivatives are energy-dense, high-octane and drop-in compounds.
- Deep knowledge in low carbon road fuels patiently build through long collaborations with:

REPSOL

- More recent collaboration started with:

*: https://www.bloomberg.com/news/articles/2023-02-28/italy-german-officials-against-eu-target-on-combustion-engines?leadSource=uverify%20wall

Conclusions

Perspectives

- Process now mature for applications in high value niche markets: make-up and Formula 1
- Horizon 2 plant in operations / Horizon 3 plant projected for mid-2026
- Clear and stepwise roadmap to ramp the production up to Sustainable Aviation Fuels and Low Carbon Road Fuels
- Potential to build thousands of plants and re-industrialize deserted territories
- Contributing to the energy independence of many countries – strategic dimension
- Perspective to reduce world CO_2 emissions by 1%, a large figure for a unique technology, bringing a concrete contribution to the main challenge of our generation: limiting global warming

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