



A growing player of the environmental transition

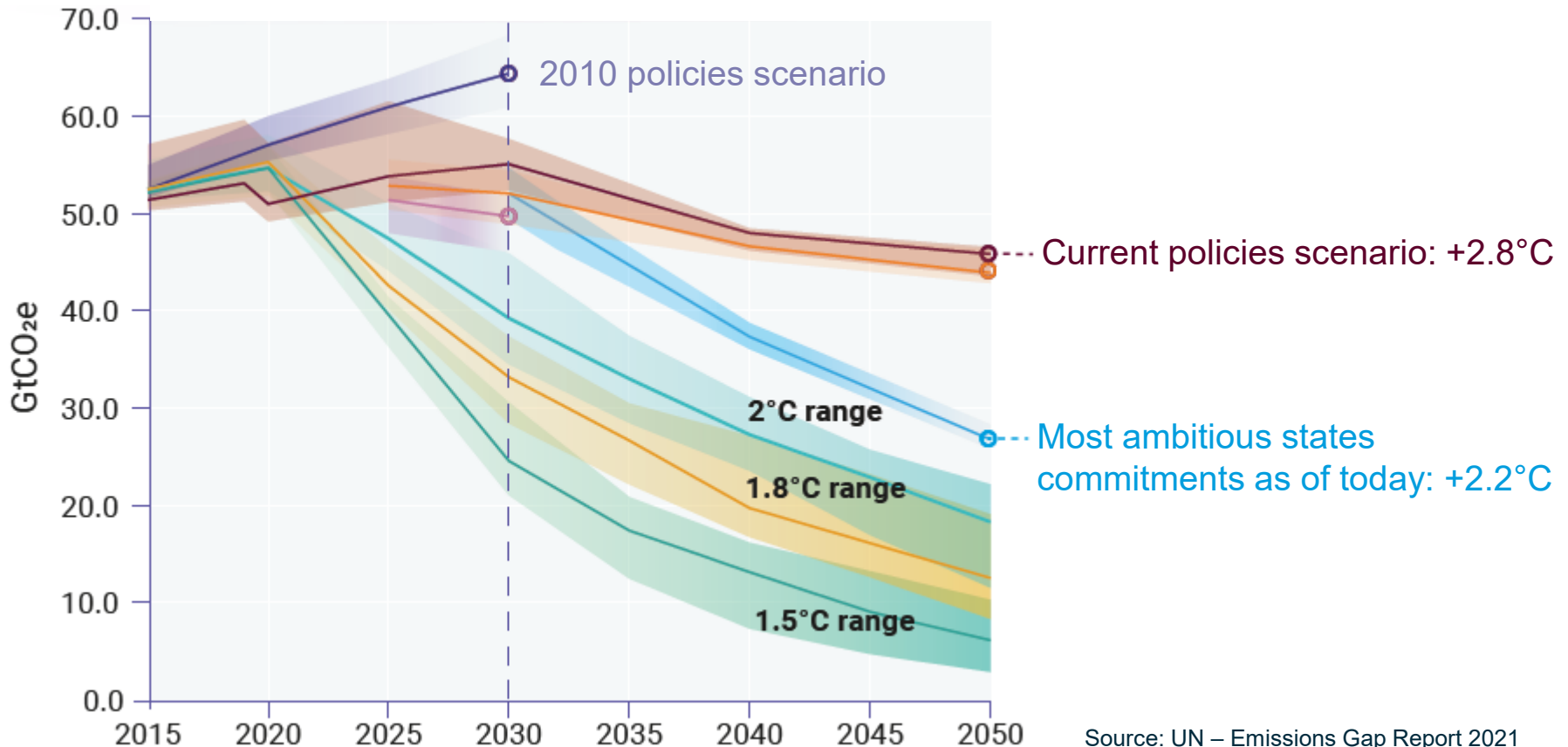
september 2022

- Founded in 2008 with the mission to use synthetic biology to build a new industrial world
- IPO in 2011 – Listed on Euronext Growth Paris
- ~50 employees in Paris area
- Manufacturing the first renewable cosmetic-grade isododecane
 - Isododecane is a key molecule for cosmetics, used for decades (in oil-sourced version) by main industry players
 - Entered commercial phase in summer 2021 with the launch of the first longwear x natural make-up brand LAST®
- Perspective to convert at large scale renewable feedstocks into sustainable jet fuel
 - One of the few technologies worldwide to have a large scale perspective in air transportation



An alarming global context

- The Paris agreement (2015) aimed at “limitating global warming to well below 2°C and preferably to 1.5°C compared to pre-industrial levels”
- Latest projections (IPCC report 2021) indicate that this goal already seems out of reach



Critical need to radically decarbonize our society

Petrochemistry



3.5 tons CO₂



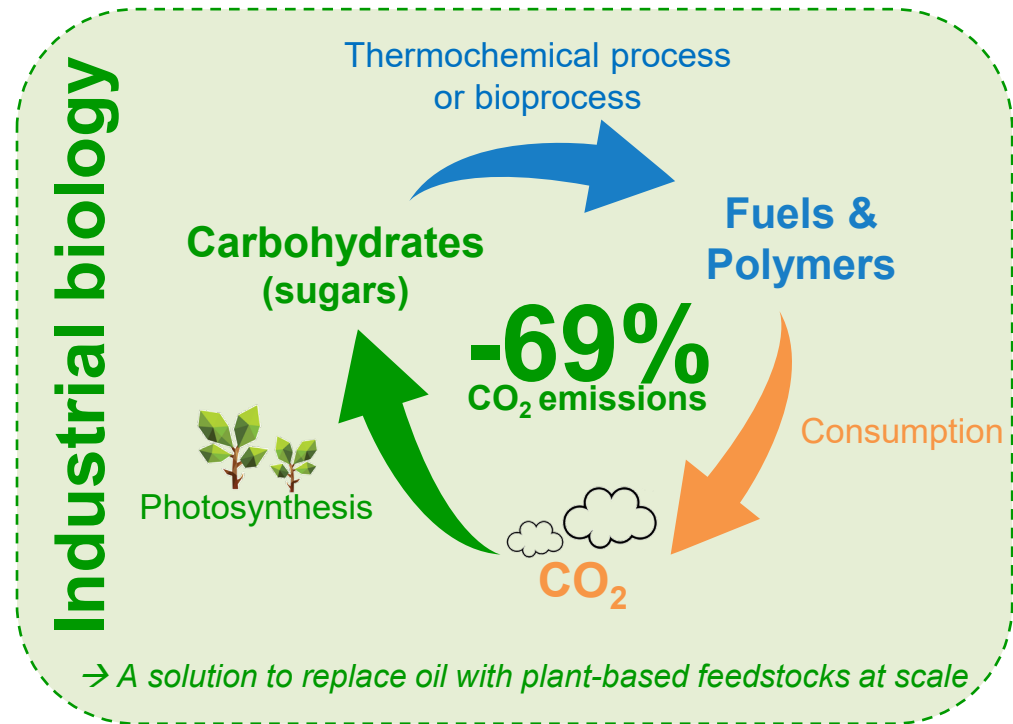
Fuels & Polymers



1 ton oil

VS

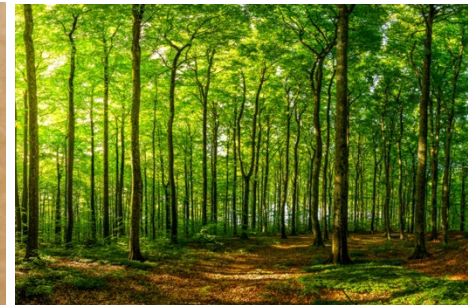
Industrial biology is one of the solutions :



‘To foster the environmental transition through biosciences’

We focus on reducing GHG emissions at scale by deploying our disruptive technology through a step-by-step roadmap

- *A pioneer in synthetic biology with a **unique sugar-to-gaseous hydrocarbon process***
- *At the crossroads between **biological fermentation** and **petrochemistry***



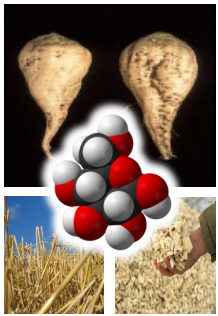
An aerial photograph of a dense, lush green forest, showing a variety of tree species and vibrant foliage. The forest is set against a solid teal background that has a curved cutout on the left side, revealing the forest. A white, rounded rectangular banner is positioned horizontally across the middle of the image, containing the main text.

A disruptive technology to impact the planet

Biomass \longleftrightarrow Isobutene \longleftrightarrow Isododecane

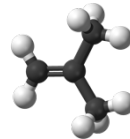
- A unique process to produce high value isododecane (“IDD”) from renewable resources addressing various markets

Beet or cane
sucrose,
Straw or wood
sugars...



BIOLOGY

Isobutene

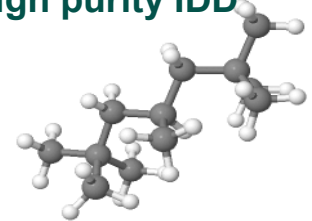


*Strong entry barriers with solid intellectual property rights: **unique sugar-to-isobutene process***



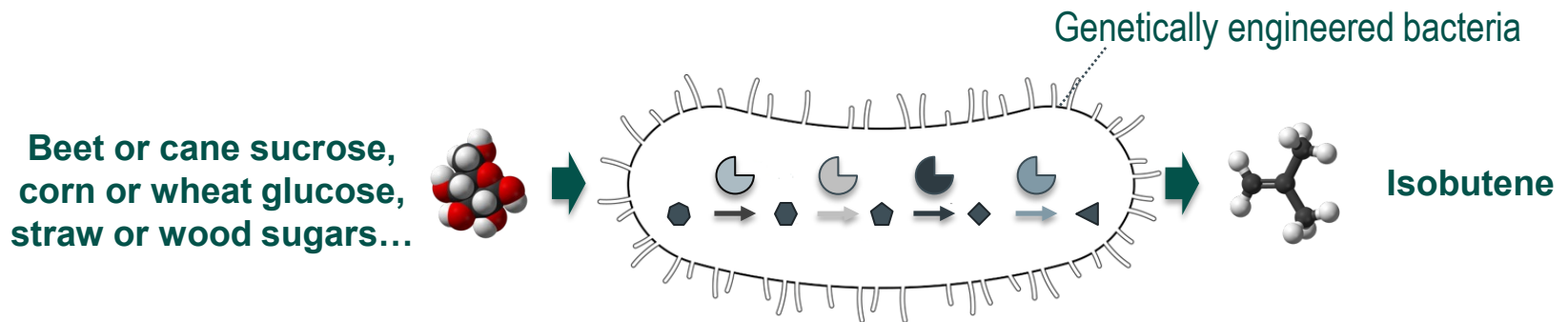
GREEN CHEMISTRY

High purity IDD



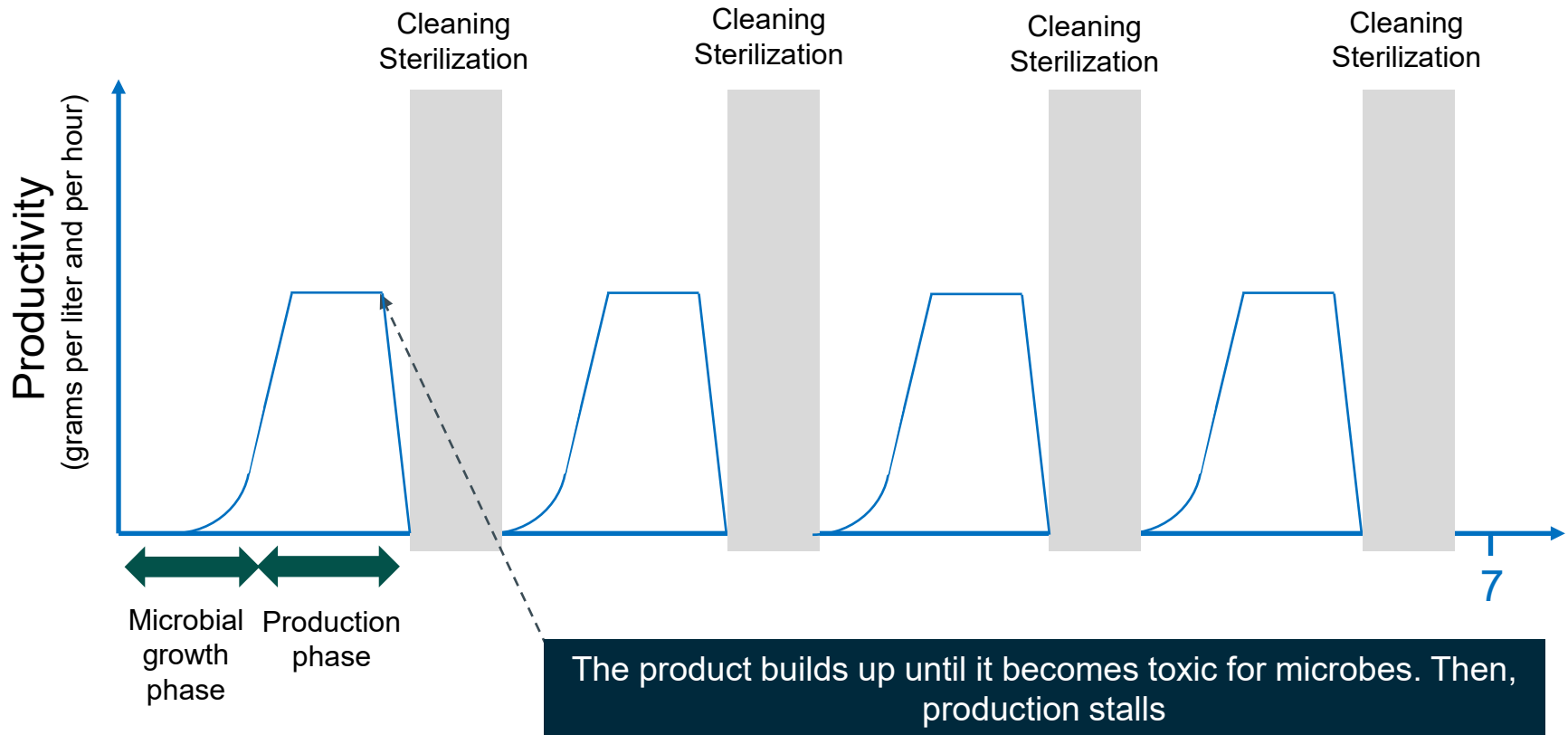
Generic technology with IP on improvements

- Engineering bacteria by implementing a metabolic pathway to isobutene



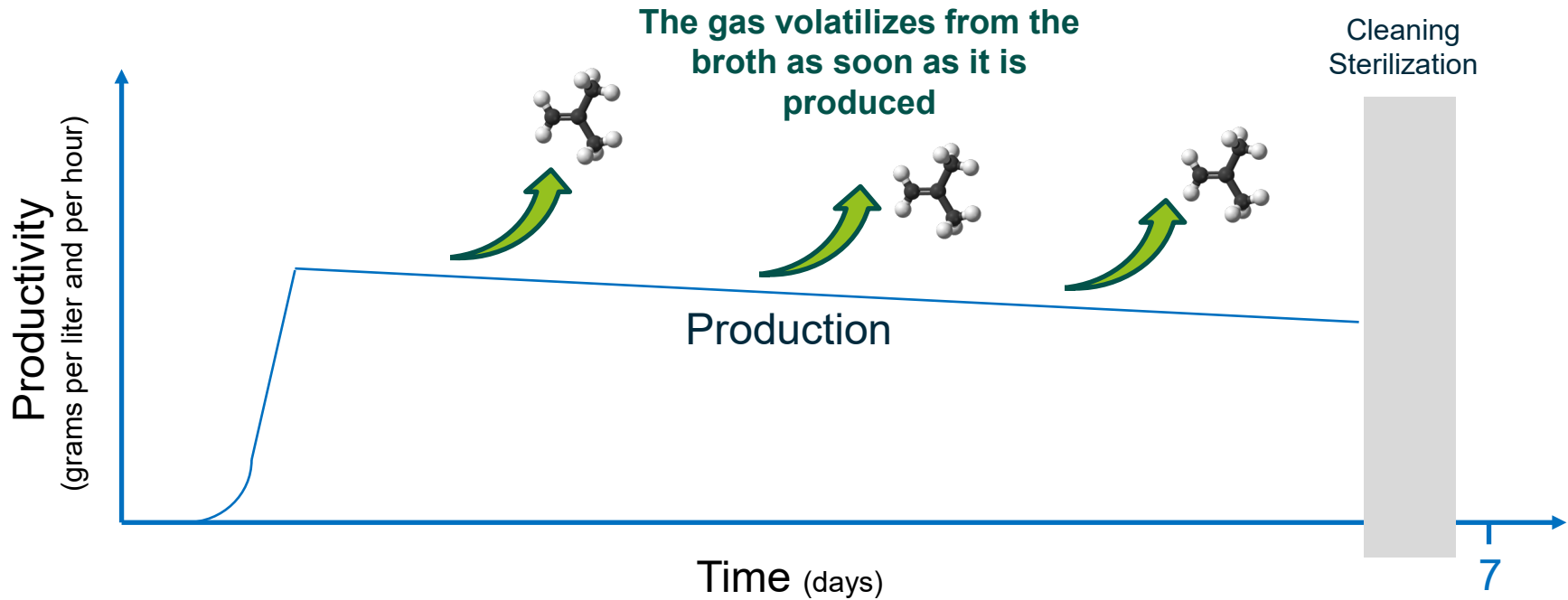
- No biological starting point because Isobutene is not produced by Nature
 - We created a unique artificial metabolic pathway - huge technology barrier overcome
- Global Bioenergies developed the first ever fermentation process to a gas, having solid advantages translating in economics.

What our peers do: producing liquid products



- Less than 50% of fermenter time is used for production (the rest is in growth phase and maintenance)
- At the end of the run, the product needs to be extracted from a complex fermentation broth → high downstream processing cost

What we do: producing a gaseous compound



- No toxicity for microbes as the product does not build up in medium → very long runs → >80% of fermenter time devoted to commercial production
- Facilitated purification because the product comes out in a simple environment (air, water pressure, biogenic CO₂)

- **Advantages:**
 - Fermentation step: Better use of equipments and microbial biomass
 - Purification: Easier and much less costly
- **Drawback:**
 - Specific equipment needed as anti-explosion (ATEX) environment needed → innovative design of fermenter
 - Retrofits more difficult

Ramping-up the production of bio-sourced IBN

Started in 2017
Demo plant in
Leuna, Germany



Used to launch
LAST®
proprietary brand

Several
tons/yr

Started in 2022
Semi-works unit in
Pomacle, France



High value
ingredients for
make-up market
Demonstration for
SAF, road fuel and
more

100 Tons/yr

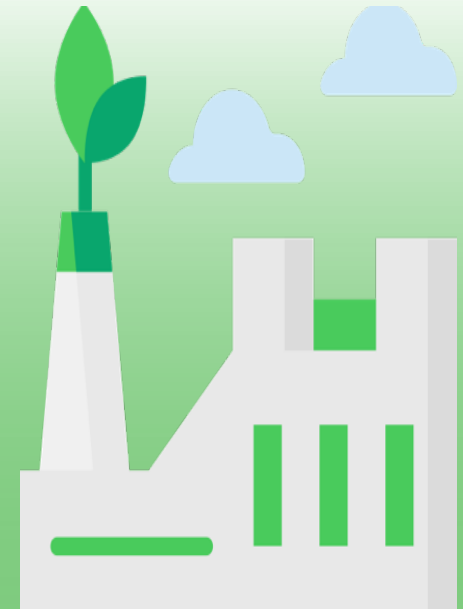
Project Ariane
2025, France



Large volume
ingredients for skin
& hair care markets
Demonstration for
SAF, road fuel and
more

2,000 Tons/yr

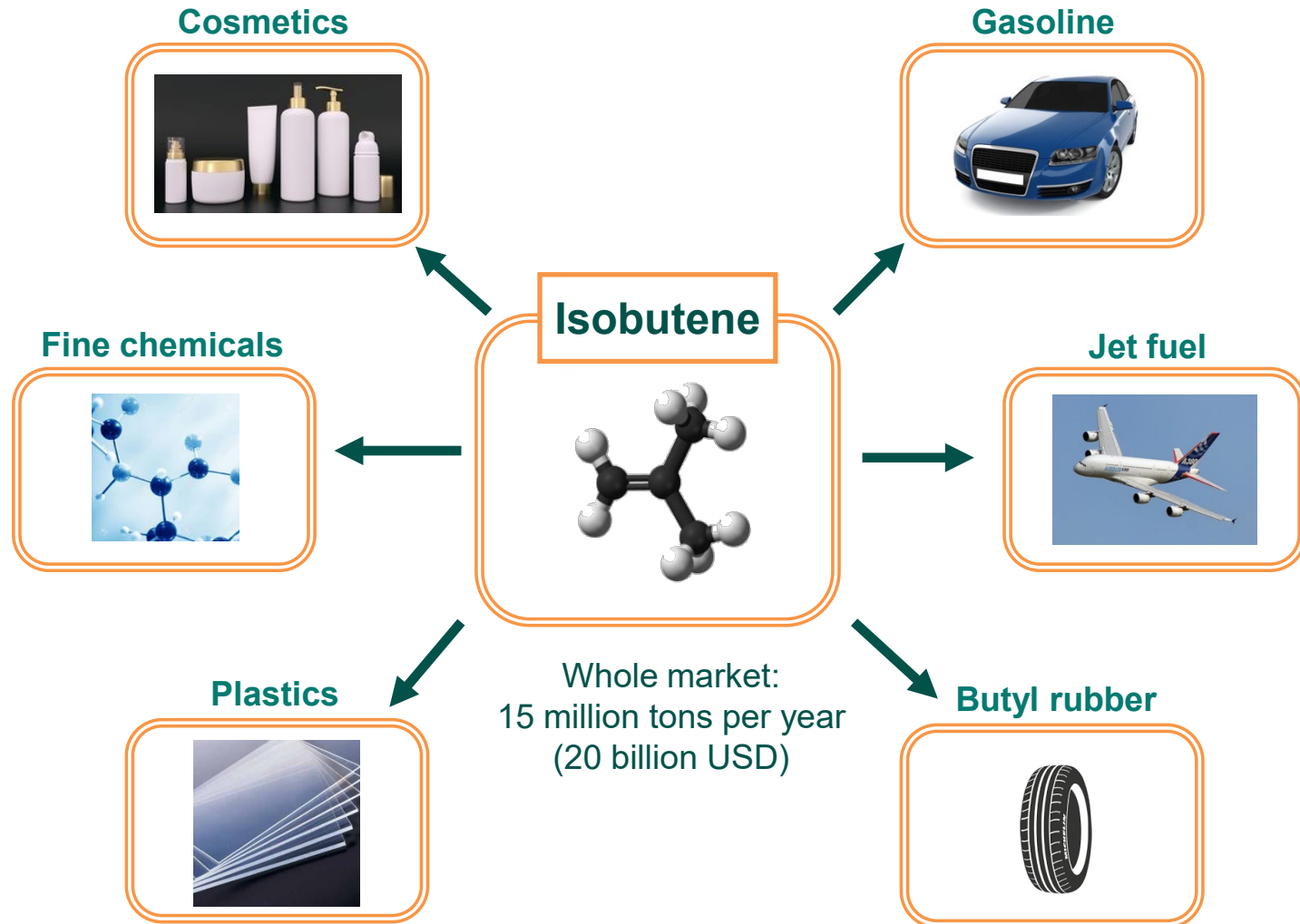
IBN-One
2028, France



Cosmetics, SAF,
road fuels, chemistry

30,000 Tons/yr

Isobutene product tree



Short term focus on 'Green Beauty'



FEU VERT SUR LES FARDS

CES MARQUES TOUTES NEUVES DÉCLINENT CHACUNE DES FORMULES ET DES EMBALLAGES ECO-FRIENDLY. AVEC UN TROPISME REJOUISSANT POUR LES COULEURS VIVES QUI APPELLENT AU JEU ET À L'EXPRESSION DE SON INDIVIDUALITÉ.

PAR ELISABETH MARTORELL



POP GREEN TECH

Tout a démarré avec la formulation de la première alternative végétale à un ingrédient pétrochimique. Ce solvant végétal permettant l'adhésion des pigments sur la peau peut représenter 50 % d'un produit final. Jusqu'à présent, il était indispensable pour garantir les qualités waterproof et longue tenue des fards. Cette belle innovation a donné envie au labo qui en est à l'origine de lancer sa marque, Last, avec dix-huit références aux teintes vives, mates ou irisées, du mascara aux ombres à paupières (des rouges liquides arriveront en septembre), Ombré à Paupières Liquide Longue Tenue, 12 teintes, 24 €. Mascara Volume Waterproof, 3 teintes, 25 €. colors-that-last.com

The Washington Post

'Clean' beauty has taken over the cosmetics industry, but that's about all anyone agrees on

11 March 2020

Demand for clean beauty products keeps mounting. Within the \$19 billion "prestige beauty" market, skin-care labels that positioned themselves as natural grew 14 percent year-over-year in 2019, while clean brands jumped 39 percent. Larissa Jensen, beauty analyst at the NPD Group, says, "In 2020, the clean skin-care category makes up more than double the size of the natural category."

Longer term perspective: Sustainable Aviation Fuel

Première mondiale en Champagne : un avion a réussi à voler avec un biocarburant issu de jus de betterave

Publié le 16/06/2021 14:46 Mis à jour le 16/06/2021 16:07

⌚ Durée de la vidéo : 1 min.



franceinfo: fuel

United Airlines just became the first airline in history to operate a passenger flight using 100% sustainable aviation fuel

[Idée verte] Global Bioenergies fait voler un avion à l'essence de betteraves avec Swift Fuel

Après une tentative dans les biocarburants pour voiture avec Audi, la greentech française Global Bioenergies retente sa chance dans l'aviation légère en partenariat avec l'allemand Swift Fuel.

L'USINE NOUVELLE



Réservé aux abonnés
Auréli Barbaux
18 Juin 2021 | 14h00
3 min. de lecture



Global Bioenergies à l'origine du premier vol international à base de biocarburant renouvelable à 97%

... spécialiste de la conversion des déchets en hydrocarbures par Swift Fuel ! Leur partenariat a bastien Le Roux dans les airs, à l'air transfrontalier alimenté par l'aviation renouvelable à près de 97%.

LesEchosWINE CLUB
Ventes Privées par Commerce

premier vol avec 97% de biocarburant entre Sarrebruck Reims



Avion « zéro émission » : Airbus toujours l'horizon 2035

- Le sommet Airbus, qui s'est tenu mardi et mercredi à Toulouse, a été largement consacré à la réduction des émissions de CO₂ de l'aviation.
- Le PDG de l'avionneur, Guillaume Faury, a réaffirmé son plan de marche vers un premier avion « net zéro carbone » pour 2035.

AÉRIEN
Bruno Trévidic
@BrunoTrévidic

La page de la crise du covid semble déjà tournée chez Airbus. Mieux si l'avionneur s'est pas encore retourné son niveau de production d'avant la crise. Les dirigeants de l'avionneur européen, qui ont défilé lors de deux jours de conférences de presse à Toulouse, mardi et mercredi, donnaient tous le sentiment d'être passés à autre chose.



L'aéronautique réglementaire pour accélérer le développement des biocarburants

Pour accélérer le développement des biocarburants, les dirigeants d'Airbus et Safran, ainsi que l'Union européenne fixant un taux minimal d'incorporation de biocarburants.

FINANCIAL TIMES

Opinion Climate change
Don't ban private jets – make them a green testing ground

The aviation industry should use these elite flights to try out new technologies and fuels

PILITA CLARK + Add to myFT



Step by step roadmap

→ Horizon 1: Launch of our own make-up brand – LAST® 2021

→ Horizon 2: Ingredients for the make-up market – 2022

→ Horizon 3: Ingredients in skin & hair care markets – 2025

→ Horizon 4: Sustainable Aviation Fuel – 2028

LAST[®] → *From Biotech to Beauty*

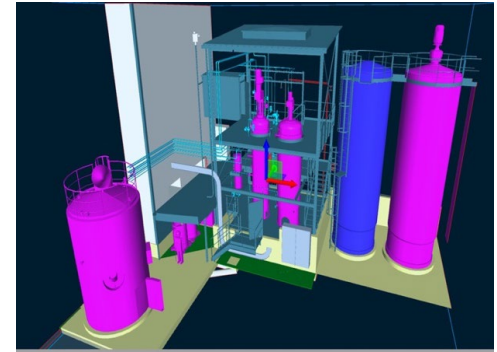
- **IDD is the key, indispensable molecule in longwear make-up,** and first ingredient in proportion: from 25% up to 60% in formulas
- First bio-sourced IDD → Unique Selling Proposition: first brand combining naturalness and longwear/waterproof/no-transfer performance
- Moving up the value chain and launching LAST[®] in summer 2021 (www.colors-that-last.com) allowed us to:
 - Qualify our raw material (regulatory...)
 - Understand how the field is organized between CDMOs and brand owners
 - Prove the high naturalness / high performance market at scale

→ Strengthened negotiating position in preparation for Horizon 2
- First e-retailers in Q1 2022. First large retailer expected in Q4.
- Sales to expand upon increase of retail selling points.



H2: Selling IDD to make-up leaders

- Small manufacturing unit in the premises of fermentation toller ARD in Pomacle, France
- Production focuses on the isobutene production, and takes advantage of tolling capacities for the upstream and the downstream segments
- Construction completed, commissioning started
- Isobutene (IBN) capacity expected to ramp up to 100 tons/yr by the end of 2022
- About 15 tons of the IBN will be used to manufacture cosmetic-grade IDD and sold under brand name Isonaturane[®]12:
 - Regulatory work completed
 - First orders signed with L'Oréal + a few others
- The rest of the IBN will be sold for various applications (other cosmetic ingredients, octane booster for motorsport, sustainable aviation fuel...)

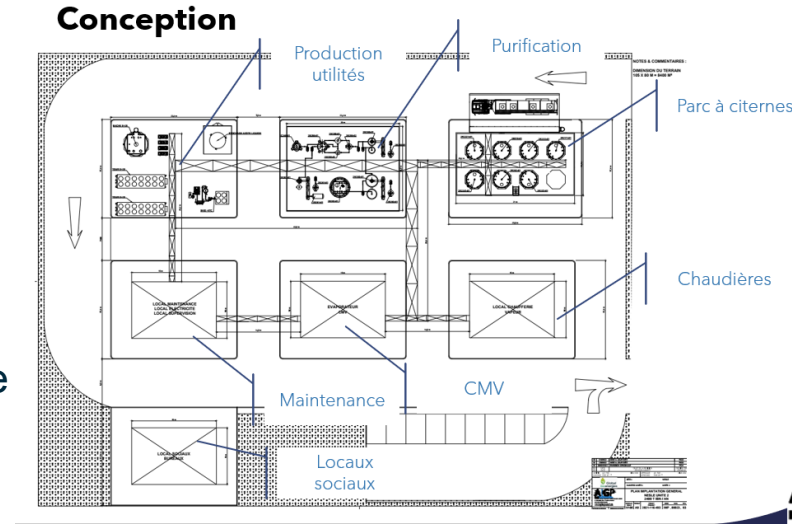


H3: Large volumes to skin and hair care

- Frost & Sullivan paid-for study:
 - IDD and IHD widely used in four of the five cosmetics segments: make-up, skincare, haircare, toiletries
 - Present market **25,000 tons/yr**
 - Ramping up to **100,000 tons/yr** within years by considering substitution of D5 silicon, soon to be banned from the whole cosmetics industry

- Plant project on its way:
 - Basic engineering completed
 - Site pre-selected
 - 2,000 tons scale
 - Special Purpose Vehicle (SPV) soon to be created
 - FID €50-60m on SPV targeted for S1 2023
 - Target revenues >€70m
 - Production to start in 2025

→ Will bring GBE profitable

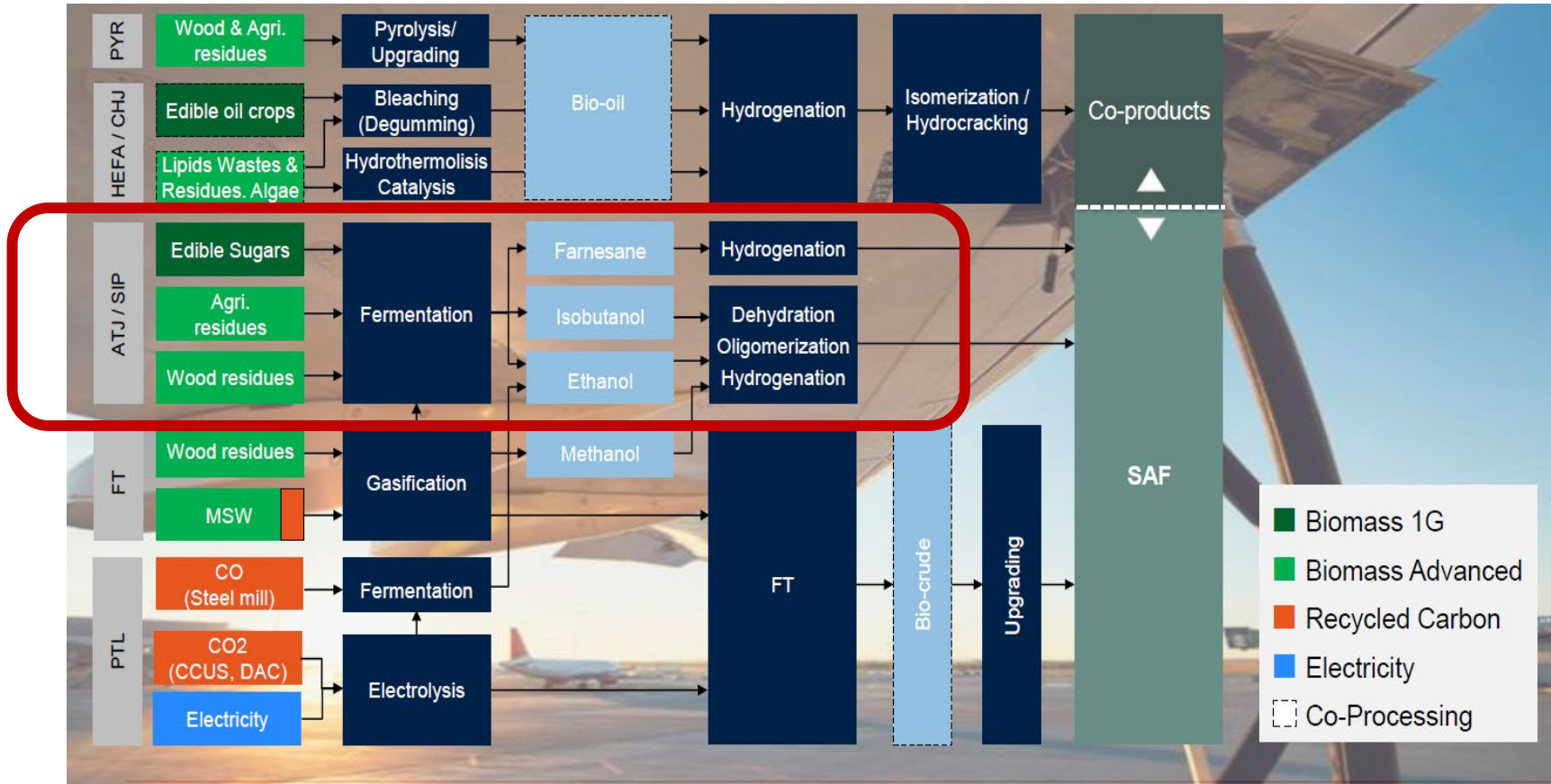


H4: Decarbonizing air transportation

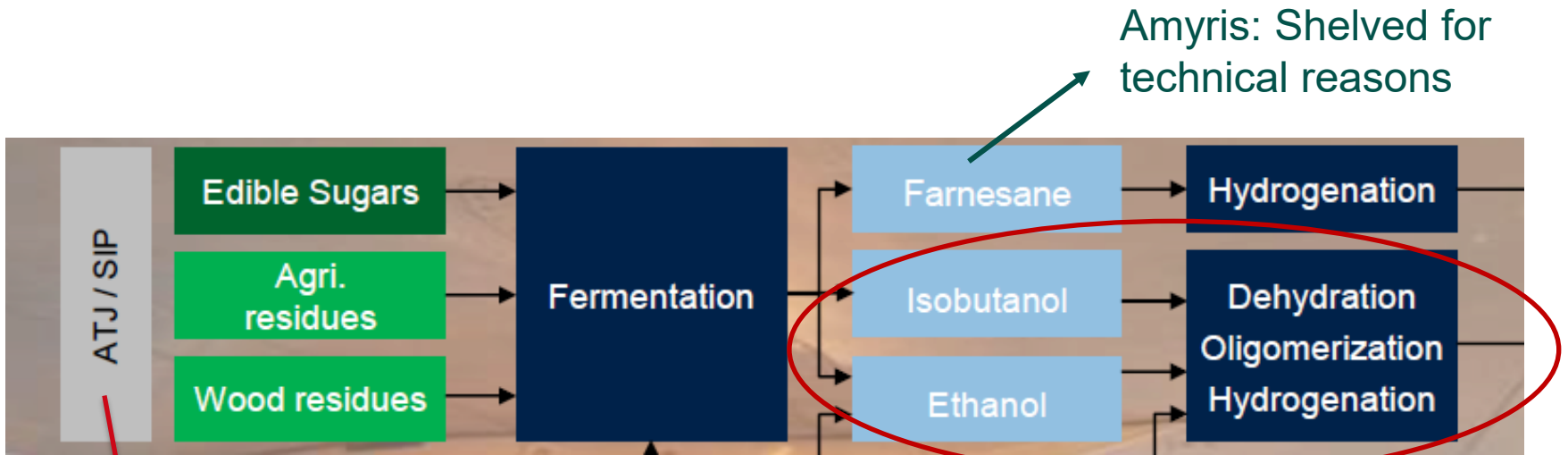
- First flight performed in June 2021 with a small airplane using **97% green aviation gasoline**
 - sends the message of our commitment to improving the sustainability of air transportation
- IDD is already approved for a 50% blend in commercial jet fuel
- ASTM-certification on its way
- Objectives for renewable & sustainable jet fuel:
 - Bring cost below 4€/kg (R&D efforts necessary)
 - New Life Cycle Analysis to calculate CO₂ 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
- A lot of communication in the press suggesting that the competition is coming from numerous technologies. In fact, the competition is quite limited...



H4: TotalEnergies' vision



H4: Focus on sugar fermentation technologies



ATJ = Alcohol-To-Jet

SIP = Synthetic IsoParaffins

These are complex names...

The field should in fact just be named
« sugar-based fermentation »

Narrow competitive landscape: only two technologies

We are not in this picture because our process is not certified yet (expected to change late 2022)

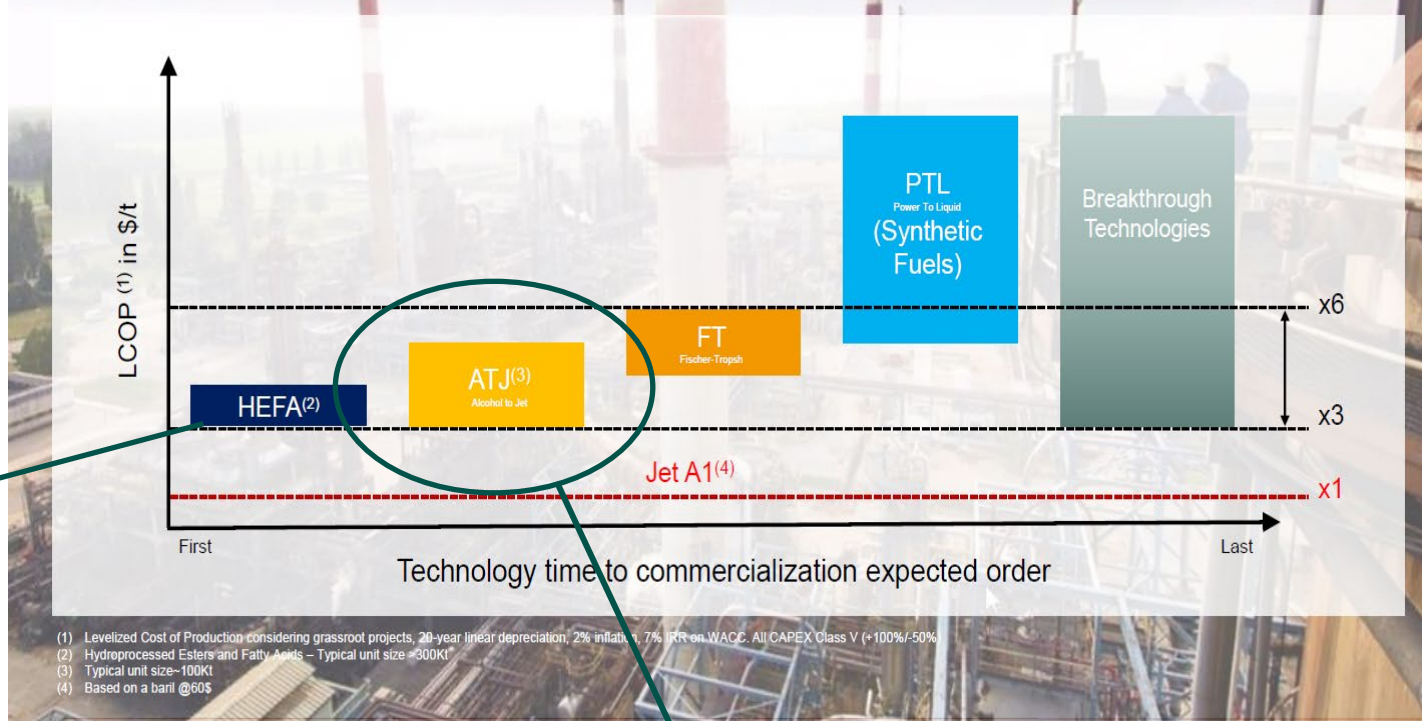
Our process surpasses the two competitive technologies: better products, better OPEX if targets reached

H4: Sequencing of technology segments

SAF LEVELIZED COST OF PRODUCTION⁽¹⁾ (\$/T)

AFTER HEFA, ATJ AND FT OFFER THE BEST LCOP⁽¹⁾ ALTERNATIVE

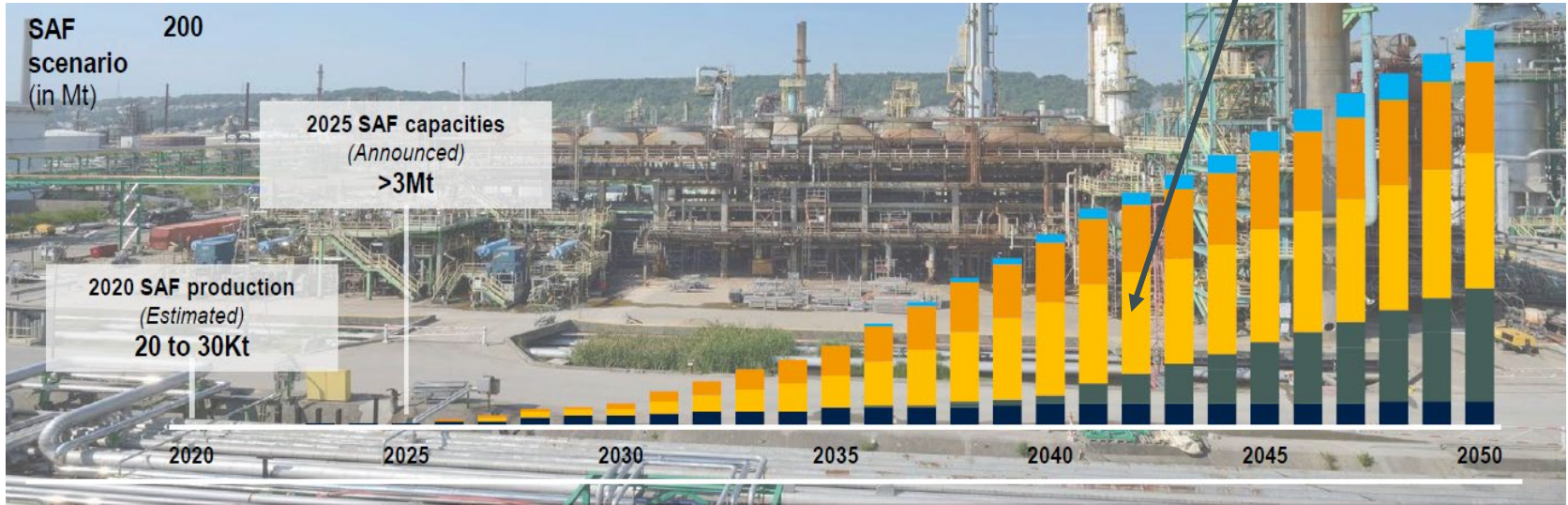
Waste cooking oils (cheap but limited resource)



(1) Levelized Cost of Production considering grassroots projects, 20-year linear depreciation, 2% inflation, 7% IRR on WACC. All CAPEX Class V (+100%/50%)
(2) Hydroprocessed Esters and Fatty Acids – Typical unit size =300Kt
(3) Typical unit size=100Kt
(4) Based on a barrel @60\$

We have the best in class technology: we could well be the sole winner...

... on the main segment...

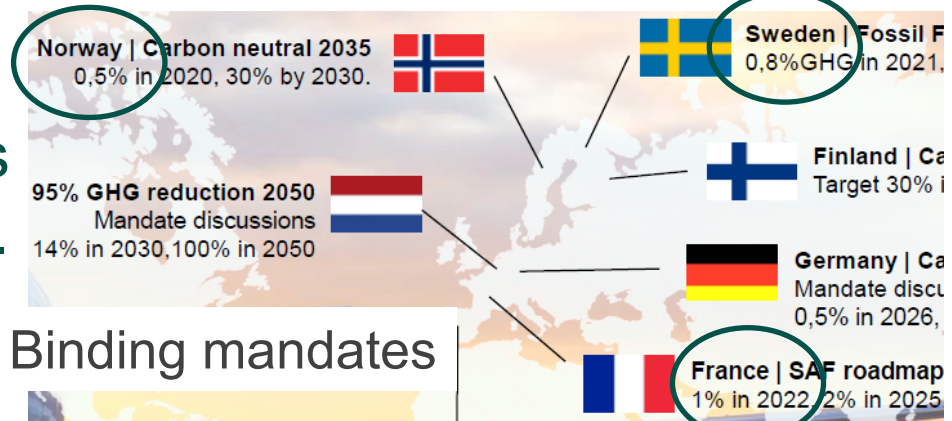


IR GRAND ENOV+ Is SAF Ready for take-off | 10 May 2021

8



... in a game that is just starting.



- 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 CO₂ emissions of cars, batteries, and electricity; tensions on rare earth elements; shortages on electricity...
- Road biofuels are back, and the continuation of thermal engines in Europe beyond 2035 now seems linked to it. Biofuels appear again as a part of the solution.
- It starts by motorsport, a niche market where higher prices are possible.



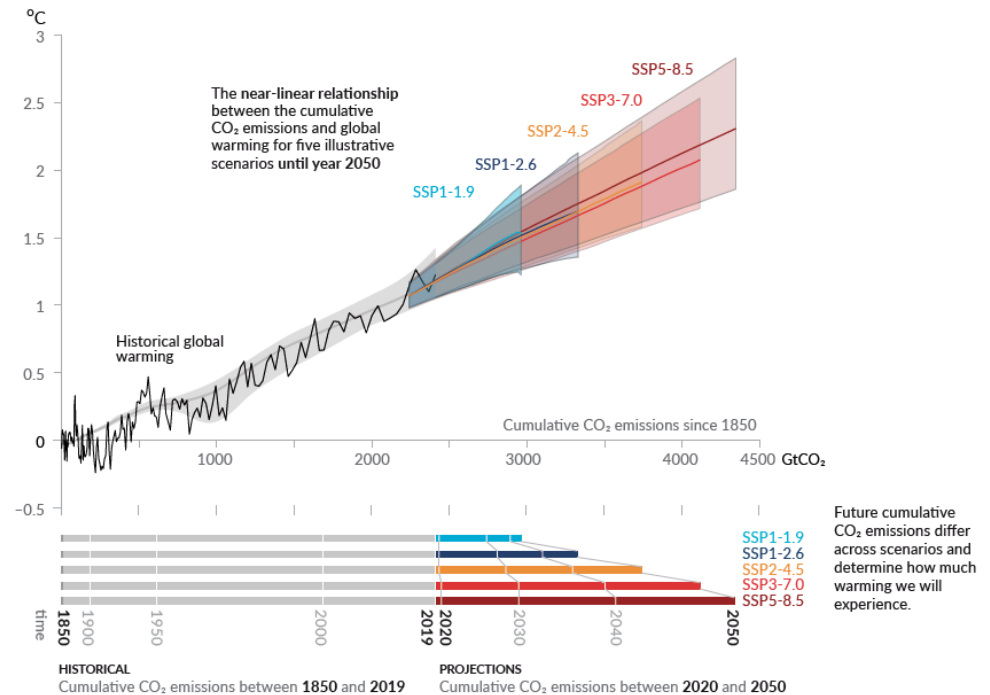


Conclusions

- Reducing CO₂ emissions down to zero by 2050 is mandatory for the planet to stay livable
- We have not started yet: CO₂ emissions are still growing year after year
- It will first require huge efforts from everyone, starting with a massive reduction in fuel and goods consumption, powered by government policies

Every tonne of CO₂ emissions adds to global warming

Global surface temperature increase since 1850–1900 (°C) as a function of cumulative CO₂ emissions (GtCO₂)



Source: IPCC report *Climate Change 2021*

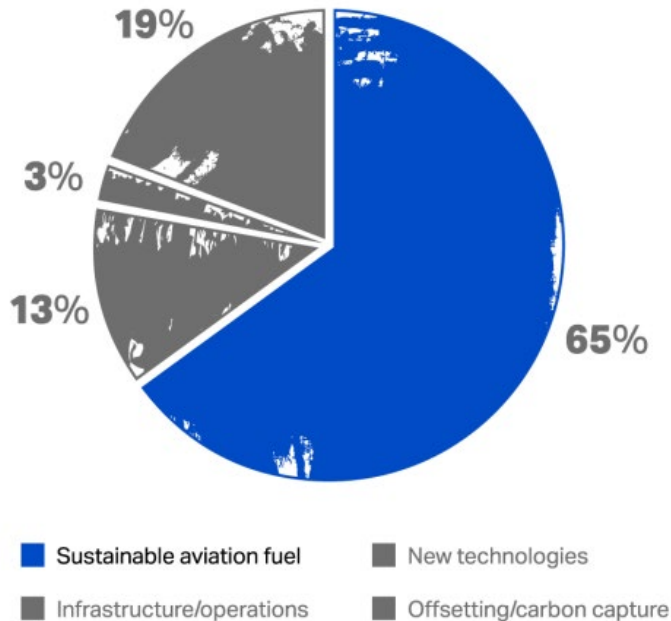
- Low CO₂ emission technologies will bring a key part of the solution by preserving some of our present living standards at a reduced environmental expense

Environmental transition – zoom on SAF



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)

Contribution to achieving Net Zero Carbon in 2050



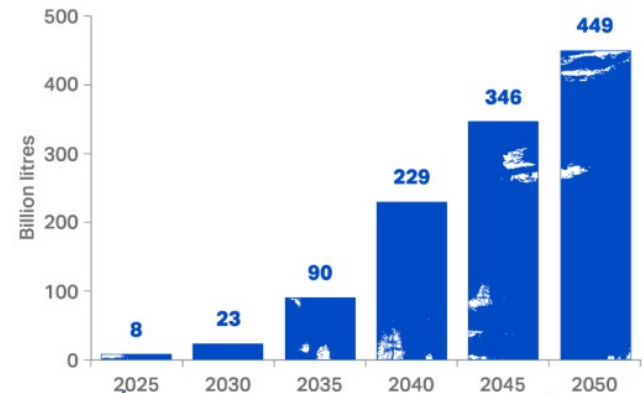
The state of sustainable aviation fuel (SAF) in 2021

360,000 flights 2016: 500 flights 2025: 1 million flights	100 million litres per annum 2016: 8 million litres 2025: ~5 billion litres	36 countries with SAF policies 2016: 2 countries 2025: global agreement?
7 technical pathways 2016: 4 pathways 2025: 11 pathways	70% average CO₂ reduction 2016: ~60% reduction 2025: ~80% reduction	\$13 billion in forward purchase 2016: \$2.5 billion 2025: >\$30 billion

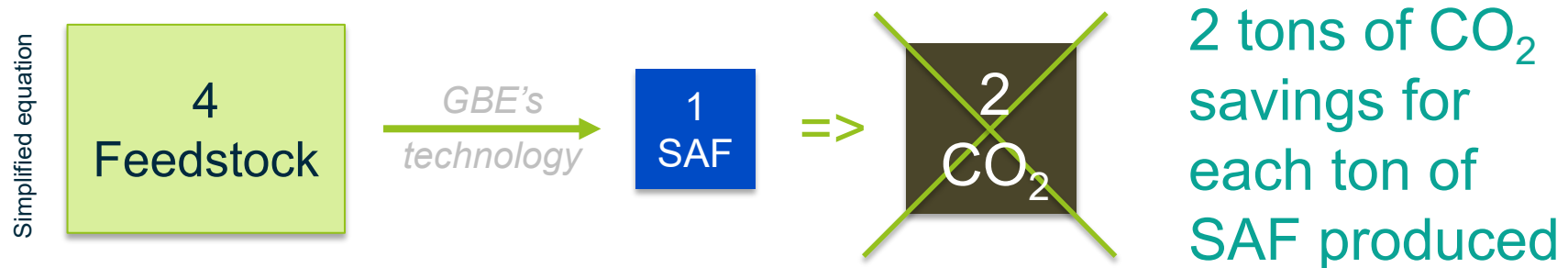
Source: IATA 2025 estimates

« 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. »

Expected SAF required for Net Zero 2050



- Human activity emits about 40 billion tons CO₂ per year
- Aggressive scenario regarding the deployment of our technology:
 - Thousands of plants based on our technology
 - Converting 1,000 million tons feedstock into 250 million tons SAF and other IBN derivatives
 - Preventing the emission of 500 million tons CO₂ per year



- 1% of global CO₂ emissions prevented, i.e. emissions of 100 million people
- Both a large figure for a unique technology, and small regarding the depth of the problem.

- Process now mature for applications in the cosmetics
- Clear and stepwise roadmap for ramping up the production from Cosmetics to Sustainable Aviation Fuels and 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 CO₂ emissions by 1%, a large figure for a unique technology, bringing a concrete contribution to limiting global warming, the main challenge of our generation

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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