



GLOBAL BIOENERGIES

*Building a New
Energy World*

May 2018

Euronext Growth: ALGBE



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Company Overview

- Global Bioenergies is an industrial biology company focused on converting renewable resources (sugar, crops, agricultural and forestry waste) into isobutene, one of the main petroleum derivatives.
 - Developed an artificial metabolic pathway – a series of enzymatic reactions - to create engineered micro-organisms that will CONVERT certain feedstocks into ISOBUTENE, a platform hydrocarbon.
 - Isobutene can be purified and ultimately used to produce Automobile fuel, Jet fuel, Cosmetics, Plastics, and Tires.
 - Isobutene addresses key market trends for decreased greenhouse emission and oil dependency
- Has advanced technology from R&D to Demo Plant status (last stage before commercial plant development)
 - Reaching commercial performances at demo scale is the main target for 2018
- Signed agreement with France's second largest sugar producer to develop first Commercial Plant
 - Estimated CAPEX: €115 million to be funded by Cristal Union, Public & Private infrastructure funds, and Banking debt
 - Global Bioenergies will have minority ownership in the JV plant and receive milestone and royalty payments (~ € 5 million at start of construction + estimated €5 million per year at capacity)
 - Commercial operations to start in 2021. First agreements already in place with L'Oreal, Aspen, Butagaz, and Audi
- R&D pipeline under development to diversify feedstocks and products

Using breakthrough innovations,

See slide 7

we convert renewable resources

into drop-in fuels and materials.

See slide 23

See slides 9-13

False ideas about biofuels

« ***Biofuels starve the planet!*** »

- False, food resources are globally oversupplied and 1/3 is wasted today
- Still, need to stay away from certain crops (palm oil), and to invest in technologies based on agri and forestry wastes



« ***They will never compete with oil derivatives!*** »

- False, biofuels compete today in premium markets
- Oil price up, sugar price down --> competitiveness of biofuels increases



« ***Electric vehicles are THE solution!*** »

- False, EVs are A PART OF the solution.
- EVs will always be inferior to thermal engine cars (lower autonomy, everyday charging requirement...)



Industrial biotechnology – the road to maturity

~100 industrial biology companies worldwide are moving the field across the Gartner Cycle

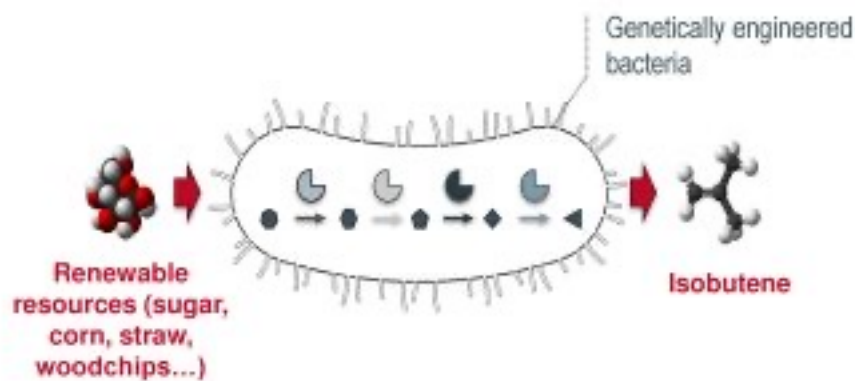


2018 : Climbing the slope of enlightenment?



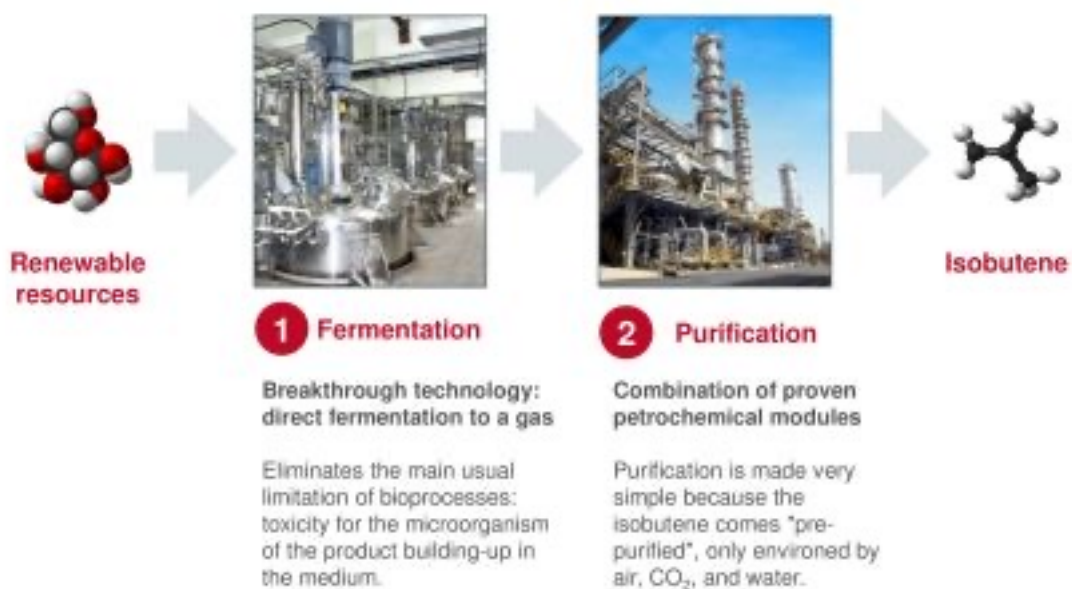
We convert renewable resources into isobutene, a platform hydrocarbon

- Using a new synthetic biology approach, bacteria become "Microbial factories"

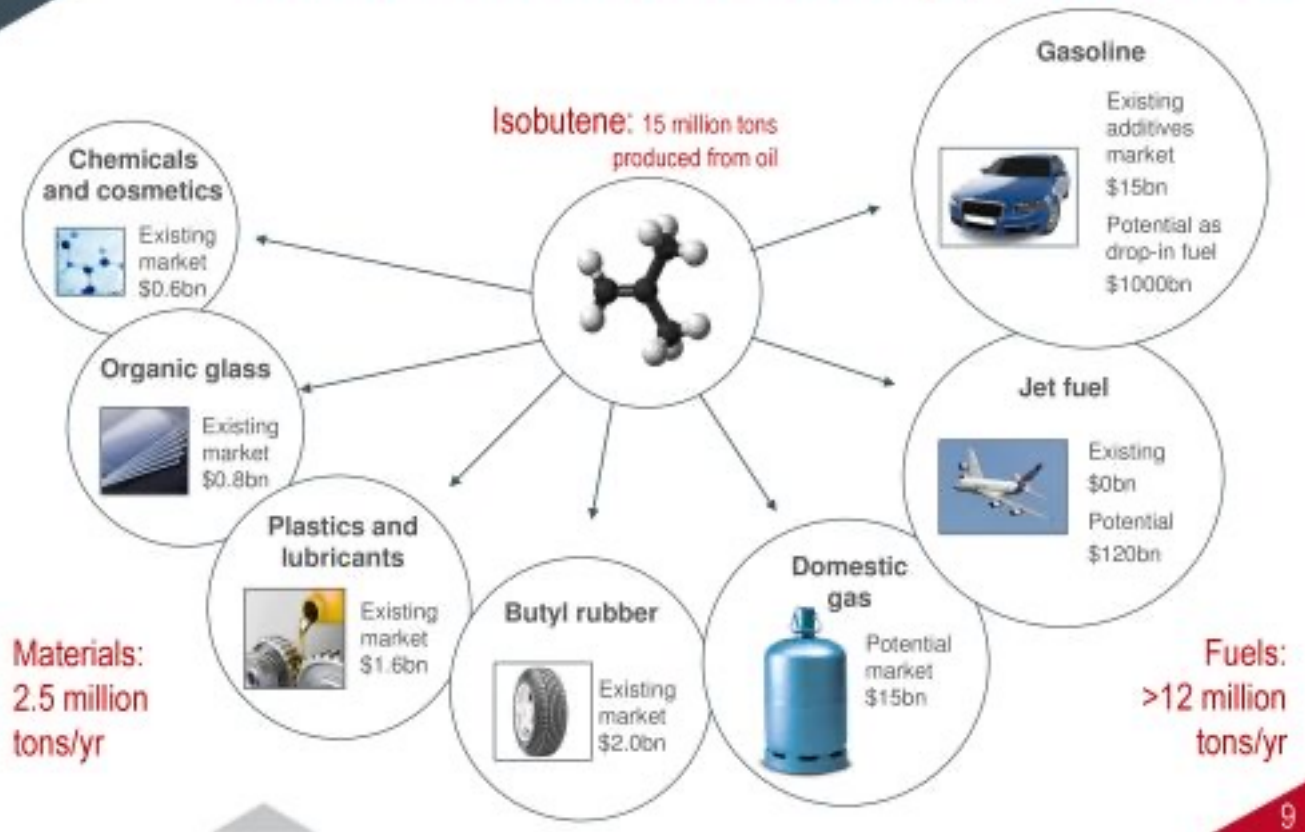


- This breakthrough innovation:
 - Opens up the domain of direct production of gaseous hydrocarbons
 - Is protected by 32 patent families on which Global Bioenergies holds exclusive rights

First ever process based on direct fermentation to a gas



A platform molecule with an existing \$20 billion market



Renewable gasoline: We jump the wall

- Bio-ethanol was the first success for renewable fuels. It has reached its own limit:

⊖ Ethanol: no more than 10% in gasoline (blendwall) ⊖

- At Global Bioenergies, we produce renewable gasoline, a high-performance hydrocarbon miscible in fossil gasoline without any technical limitation.
- It can be used in any gasoline car.
- It can be distributed using the existing depots, pipelines, tanks and pumping stations, meaning no investment needed in infrastructures.



→ It is thus called a « drop-in » biofuel.

Recent event as part of the Audi deal: first car on a circuit

- G-612: Blend containing 34% renewable gasoline.
- Contains renewable isooctane and ETBE made from green isobutene produced at Leuna demo plant.
- Compliant with EN228 European norm for gasoline (could be sold on the market without any additional registration).
- Used in a standard Audi A4 car on April 5, 2018. No modification on the car necessary.
- High performances (high octane number), and possibly reduced particles emission.
- First time ever a gasoline blend containing more than 15% renewables and respecting the gasoline norm was used in a standard car.
- Perspective to massively commercialize this blend in the future thus markedly increasing biofuels' market penetration.



Watch the video !



We also target Jetfuel, a market in its early days

- Jetfuel market: 120 million tons (equivalent to 2,400 plants of 50,000 tons each)
 - Bio-jetfuel not significantly existing at present
 - High technical and regulatory constraints
- Limited competition
 - Isobutene to Jetfuel (Global Bioenergies)
 - Palm oil hydrogenation (Neste)
 - Farnesane (Amyris)
 - Alcohol to Jet (Gevo)
 - Fischer-Tropsch (Fulcrum)
- Building the market
 - Strong will from the aviation industry expected to turn into mandates and tax incentives
 - Many voluntary initiatives taken by commercial airlines



Application in materials and cosmetics



- Each market with its specific drivers:
 - Niche markets for renewable rubbers and plastics
 - Specific market pull in the paints, due to their poor environmental image
 - Isobutene derivatives largely used in cosmetics: expectation for very high premium price
- Will be the first markets addressed
- Ton-scale production at Demo plant already targeting these markets

Two major issues addressed at a time

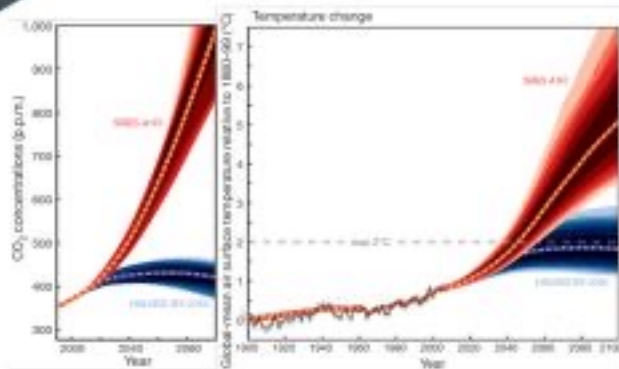


1. Reduction in
CO₂ emissions



2. Decrease in Oil
dependency

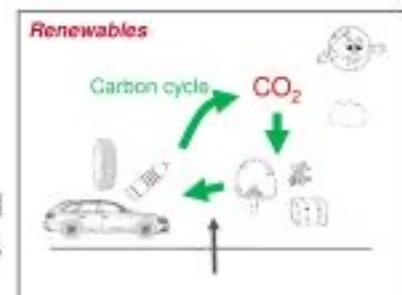
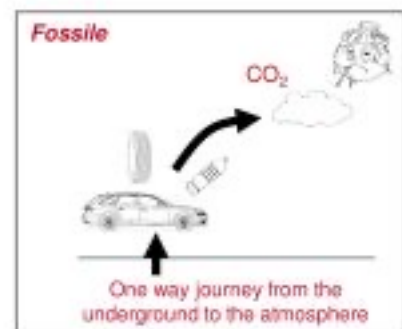
1. Reduction in CO₂ emissions



The planet will warm by several °C before 2100 if nothing is done to reduce Green House Gas emissions.

Cataclysmic consequences.

Renewables recycle atmospheric CO₂, and reduce GHG emissions by 2 to 5 folds



2. Decrease in oil dependency



- Oil demand increases steeply: +1.5% per year
- Shale Oil deployment matches the demand for now - No guarantee it can last for long...
- Catastrophic scenarios if oil becomes scarce - Need to prepare solutions to complement oil

- Renewables today represent less than 2% of oil production. Could go up to 10% if new technologies emerge.
- Producing biofuels on its land becomes strategic for countries depending on imported oil.



Perspective to improve air quality



Particles in cities lead to 3 million premature death worldwide (300,000 in Europe)
Modern direct injection gasoline engine emit large amount of particles

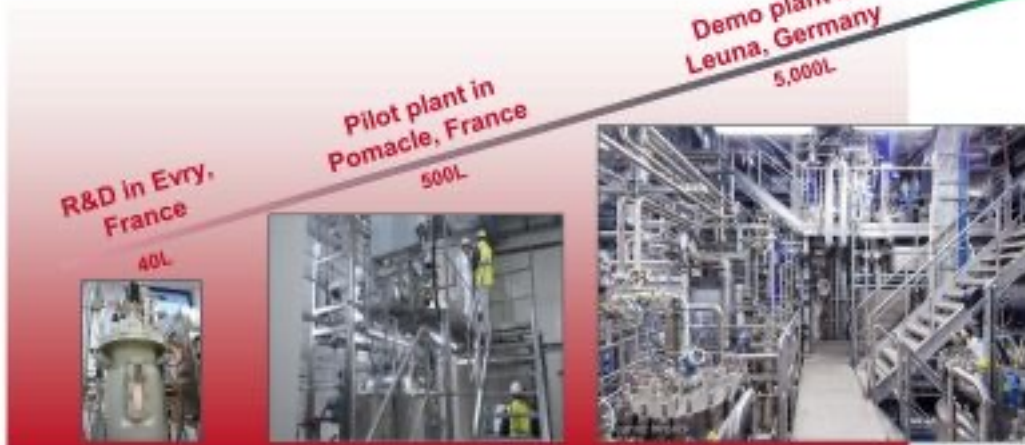
Isobutene derivatives are high performance compound for gasoline engines, and could help reduce pollutants emissions

Preliminary tests performed in single cylinder engines, to be further confirmed in road testing

Technology maturity

- Started from a paper project in 2008
- R&D milestones hit, then construction of proprietary pilot and demo plants
- Reaching commercial performances at demo scale is the main target for 2018
- First commercial plant in engineering phase

Commercial Plants



IBN-One: first commercial plant project

- ▶ Cristal Union: #4 in the sugar industry in Europe. €2.5b in revenues.

- ▶ IBN-One supported by the French State (*Investissements d'Avenir*)

- ▶ Engineering studies:  

- ▶ Estimated CAPEX: €115m to be funded by:

- Cristal Union
- Public & Private infrastructure funds
- Banking debt

- ▶ Commercial operations to start in 2021

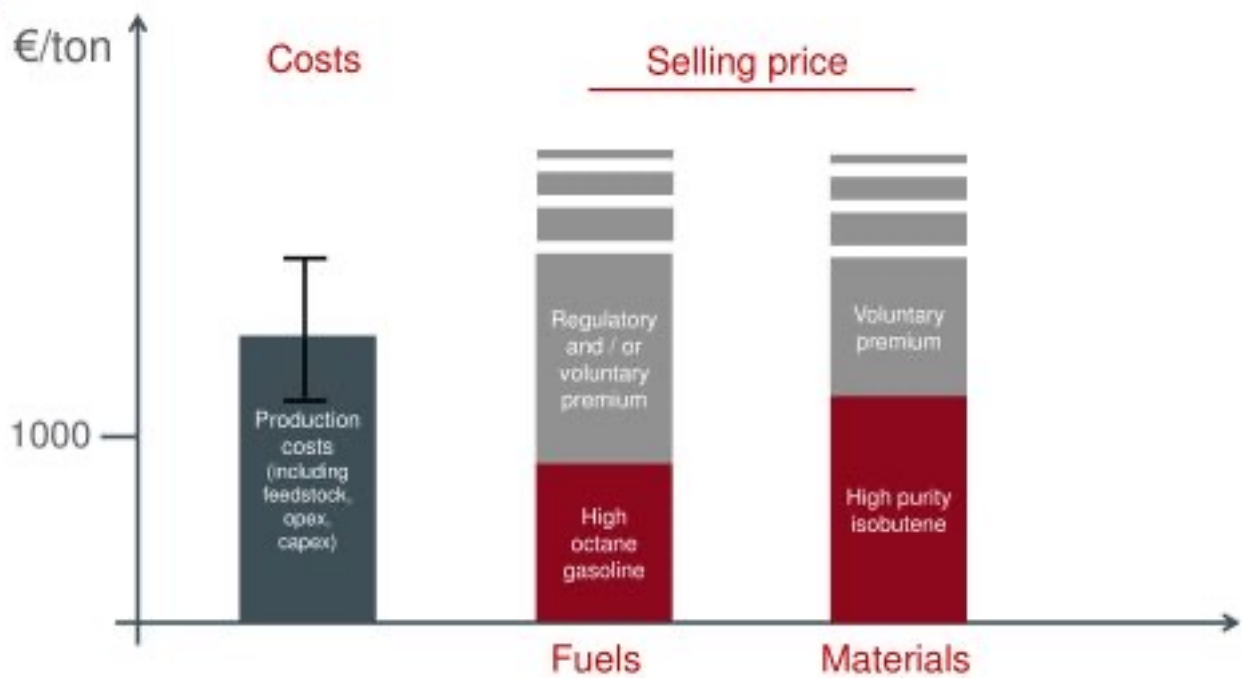
- ▶ First agreements signed with



- 1 **Production** – 120-200kt industrial sucrose are converted into 30-50kt gaseous, low purity isobutene
- 2 **Purification** – isobutene is isolated from surrounding fermentation gases
- 3 **Shipping** – Liquid high purity isobutene (99.7%) is stored and shipped for chemical applications
- 4 **Conversion** – Part of the production is converted on site into bio-fuels



Forecasted economics

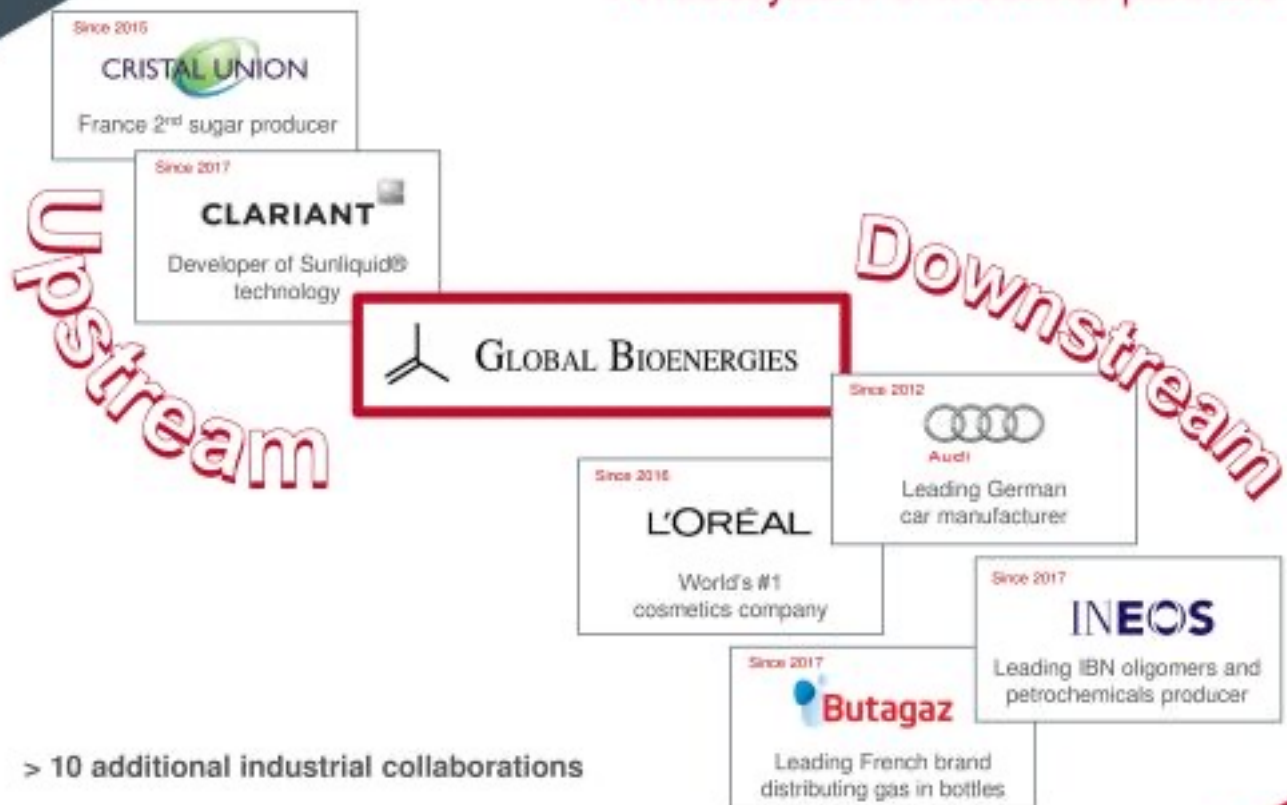


→ Estimations done with March 2018 oil and sugar conditions

A licensing business model

- Licenses to be granted to industrialists, for them to build and operate.
- No CAPEX involved for Global Bioenergies (€11m investment in Demo plant was the last CAPEX to be supported by Global Bioenergies).
- For a typical 50,000 tons project: €5m upfront + €5m/yr royalties to Global Bioenergies.
- Market in thousands of such 50,000 tons units. Market will open progressively as technology matures and as market conditions continue to improve.
- Global Bioenergies would be profitable with only 3 licenses, possibly in 2021.

An ecosystem of industrial partners



First axis of R&D: diversifying the feedstocks

Availability	Today	Short term	Longer term
	<p>1G Food crops</p>  <p>Traditional feedstocks Sucrose: Beet, cane Glucose: corn, wheat</p>	<p>2G Wood chips, straw, bagasse</p>  <p>Advanced feedstocks Forestry: wood chips Agri: wheat straw, corn stover...</p>	<p>3G Industrial waste gases</p>  <p>Emerging feedstocks Steel mill syngas Concentrated CO₂</p>
Cost of resource	[Grey bar indicating increasing cost from 1G to 3G]		
GHG savings	[Grey bar indicating increasing GHG savings from 1G to 3G]		
Potential partners	Major agricultural players.		steel mills and eventually CO ₂ -emitting industries
		Forest operators	

Second axis of R&D: diversifying the products

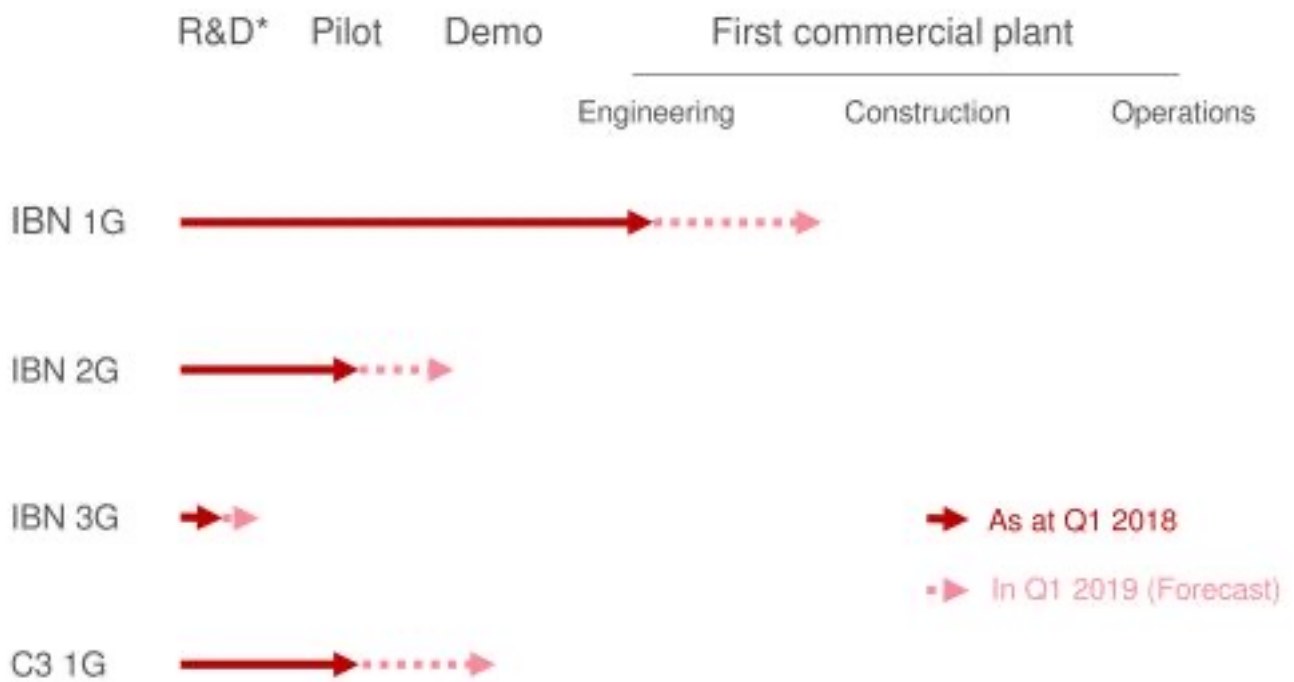
- A second process is under development, and targets Acetone, Isopropanol and Propylene (three carbons compounds)
- Process named "C3"
- Acetone and Isopropanol target niche markets in cosmetics and fine chemicals
- Propylene targets a huge market: bulk plastics (car industry, furnitures, toys...)
- Possible markets in the fuels as well
- Process progressing extremely well in R&D. Scale-up in progress

C3 and IBN processes target the same global markets



→ Natural business development synergies

Pipeline overview

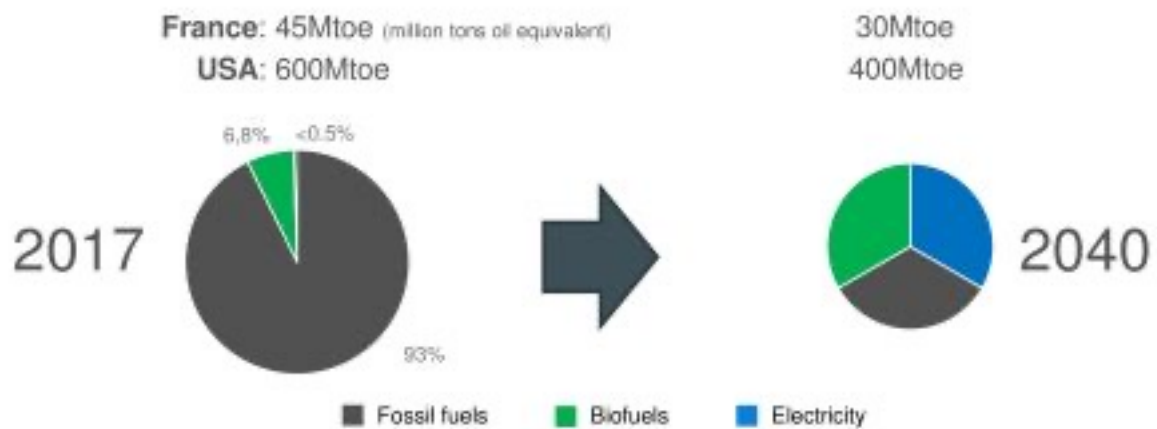


*: targeted performances not yet reached for IBN nor C3 processes. Further R&D ongoing

Renewable gasoline vs electric vehicle

- In 2017, many have said that EVs would take the whole automotive market by 2040.
- But autonomy limitations, grid issues, debatable carbon footprint, real infrastructure cost for nations... is moving the consensus to a more prudent position.
- Targeting the market of the second car of families (20-40% of the market) within a few decades is already a great challenge.

Vision for road transport in France and in the US



Transition Pillars

Consumption reduction (better cars, shared transportation...)
 Biofuels deployment
 Increase in renewable electricity, new infrastructures, grids

Impact

Oil consumption down 75%
 CO₂ emissions down 60%

Management

Executive committee



Marc Delcourt
Chief Executive Officer



Samuel Dubruque
Chief Financial Officer



Macha Anissimova
Chief Scientific Officer



Frédéric Pâques
Chief Operating Officer



Bernard Chaud
Head of Industrial Strategy



Luc Mathis
Chief Business Officer



Jean-Baptiste Barbaroux
Chief Corporate Officer

Vice presidents



Dr. Richard E. Bockrath
VP Chemical engineering
Former Technical Director at DuPont



Dr. Charles E. Nakamura
VP Metabolic engineering
25 years at DuPont.
Received ACS award in 2007



Claudia Erming
VP Investor Relations
Former Head of ECM-Origination at Berenberg Bank

Board of Directors

Board of Directors



John Pierce – Chairman of the Board

Leading American figure of the industrial biology sector, former Chief Bioscientist of BP



Marc Delcourt – Co-fonder and CEO

Entrepreneur with a scientific background. Has founded and managed industrial biotechs since 1997



Philippe Marlière – Co-founder and President of the SAB

Visionary scientist. Has pioneered the translation of biology into industrial applications



Sébastien Groyer – Partner at Seventure Partners

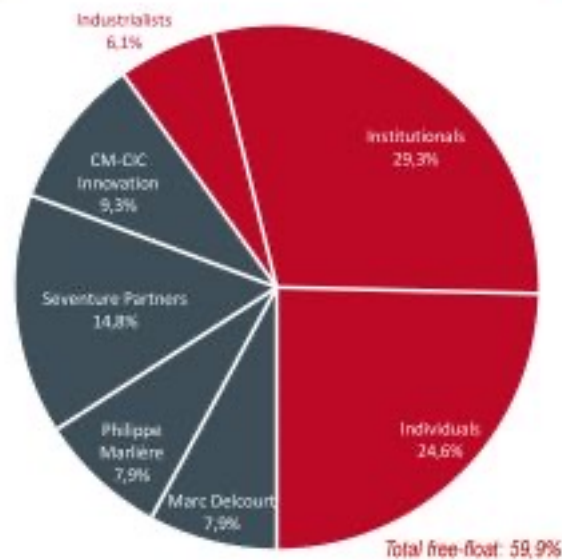
Has participated in the investment, administration, market launch or takeover of about 20 innovative companies



Karine Lignel – Director at CM-CIC Investissement

A trained engineer active in Venture Capital since 2000

Shareholders and equity financing

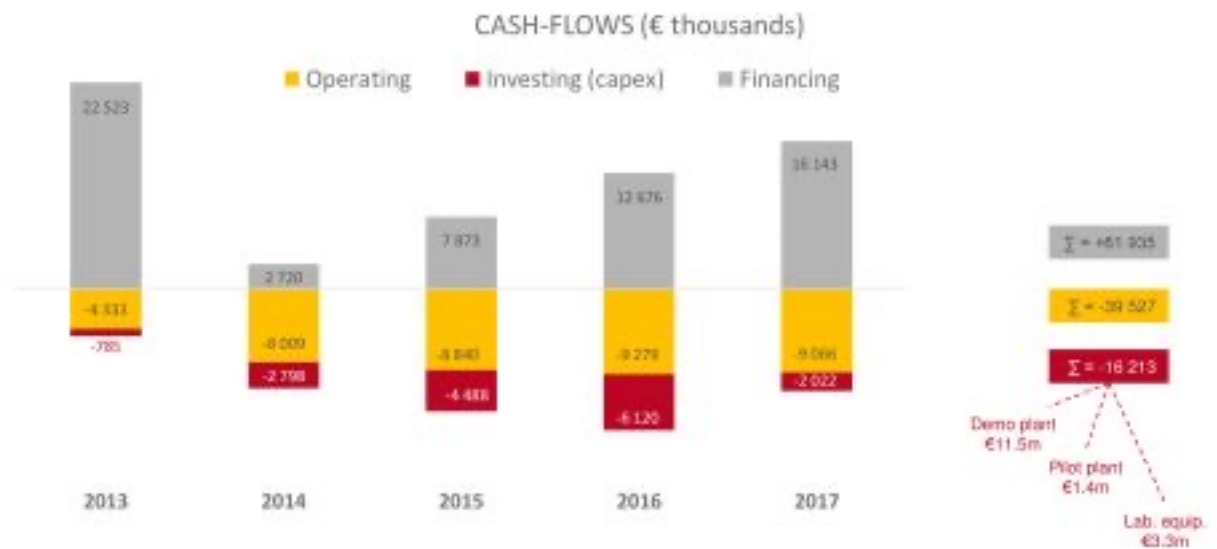


- ▶ 71 million euros raised to date
- ▶ Market cap ~€85m

Existing shares as at March, 31 st , 2018	4,518,761
+ Dilutive instruments (stock-options, warrants...)	+ 570,058
including stock options for employees and VCs:	761,539
Fully diluted:	= 5,088,819

Average daily liquidity	
2012	€16k
2013	€32k
2014	€77k
2015	€96k
2016	€90k
2017	€120k
2018 YTD	€186k

Yearly cash-flows



- All major investments behind (laboratory equipment, pilot, demo plant)
- Cash in hands as at Dec 31st, 2017: €13,3m

Appendix

Market economics are improving

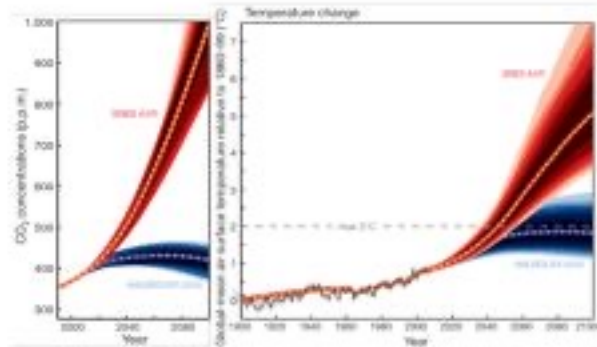
- Oil price is recovering progressively (\$70 recently, up two folds from 2016)
- Sugar price went recently down, in particular due to the large increase in European sugar production (end of the quotas system)



Sugar #11, US cents per pound.

Climate Change: potential for global impact

- Climate change metrics
 - Temperatures already 1 °C above historical average
 - Paris Agreement aims a 2 °C increase maximum by 2100
 - At the present trend, would reach 3.5 °C
- Green House Gas emissions ⁽¹⁾
 - Have reached 53Gt per year in 2017
 - Must be lowered by 11Gt in 2030 to meet Paris objectives
 - Must be negative by end of century
- Great potential in Transport sector. Regulations shall promote ⁽²⁾
 - Efficiency (35% of 2030 objective)
 - Biofuels (6% of 2030 objective)
- Global Bioenergies' drop-in products can be a significant part of the solution



(1) Total Green House Gases expressed as tons of CO₂ equivalent
 (2) UN Environment – Emissions Gap report 2017

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