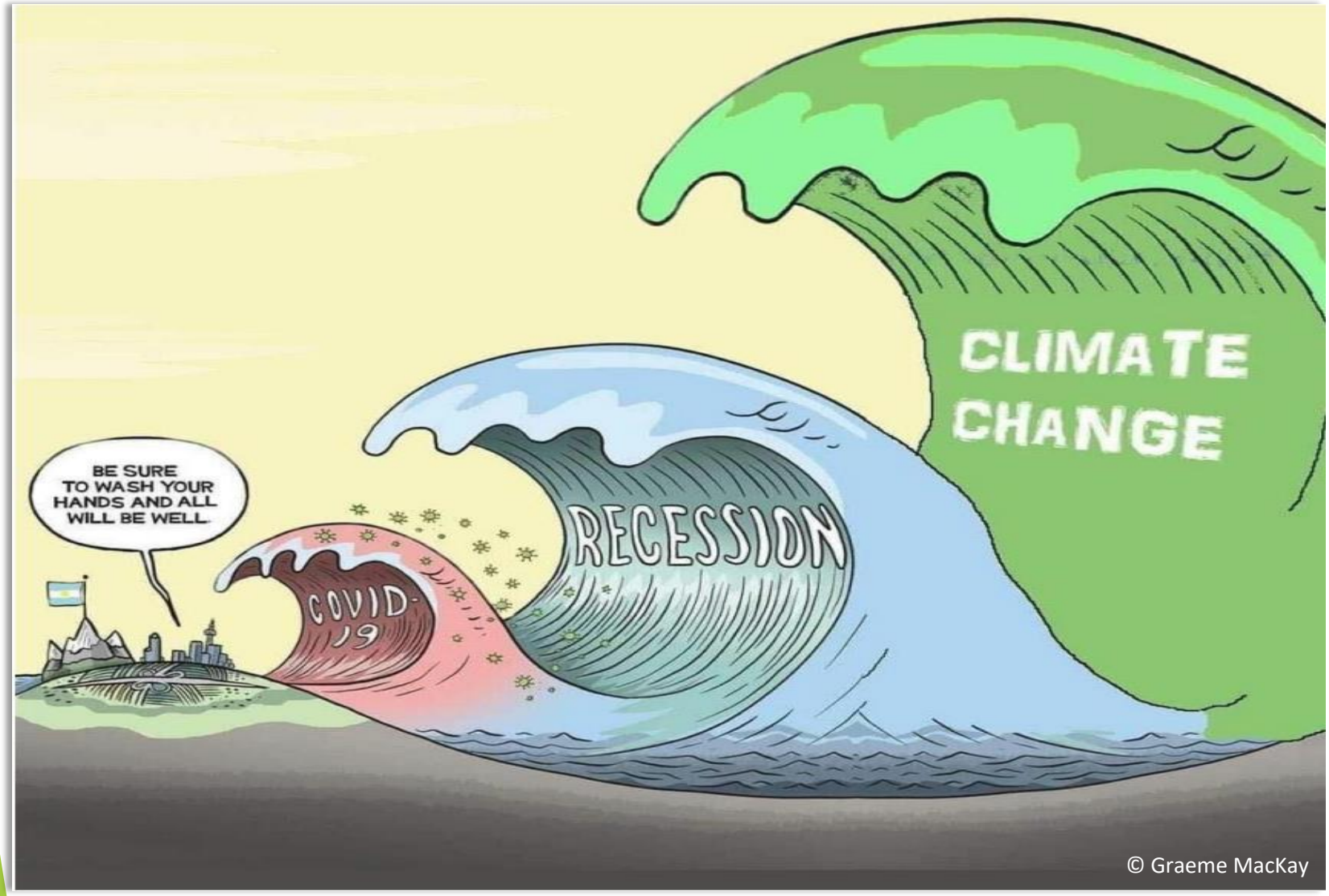
CLIMICALS

# Our Society is facing critical threats



# Our vision of the ecological transition

**Plant-based materials and sustainable feedstock will inevitably replace fossil hydrocarbons**

- Reduced GHG emissions
- Non-Dependence on fossil resources
- Relocalized supply chains
- Sustainable agricultural and land use
- Attractive and valuable materials
- Controlled health impacts
- Recyclable materials
- Cost Competitive

# Our promise

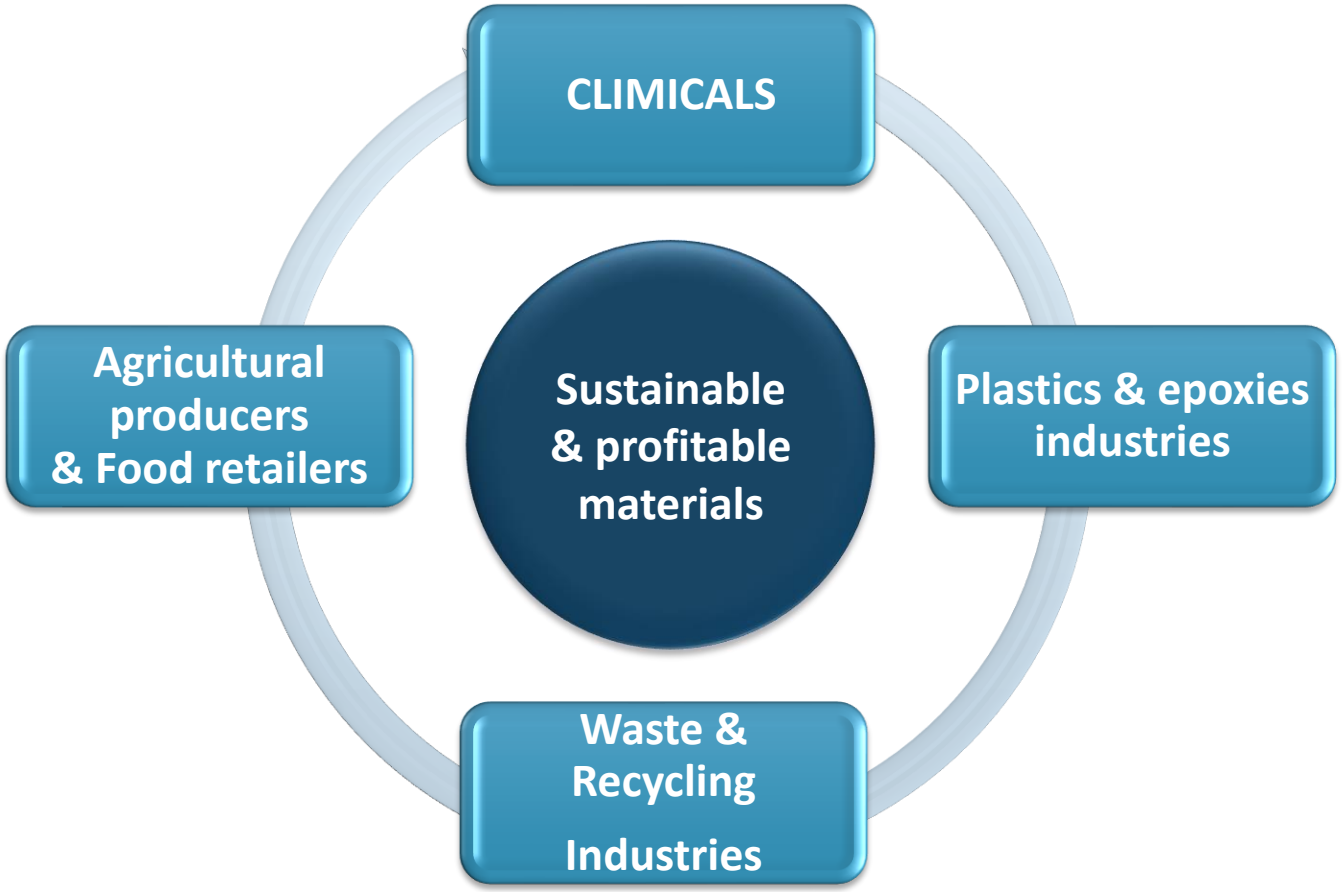
**By developing an innovative process to produce plant-based monomer, we contribute simultaneously to :**

- **Enabling new bio-epoxies and bioplastics with attractive properties**
- **Reducing GHG emissions**
- **Valorizing natural and waste resources**
- **Developing new markets arround innovative applications**
- **Building local and circular value-chains**

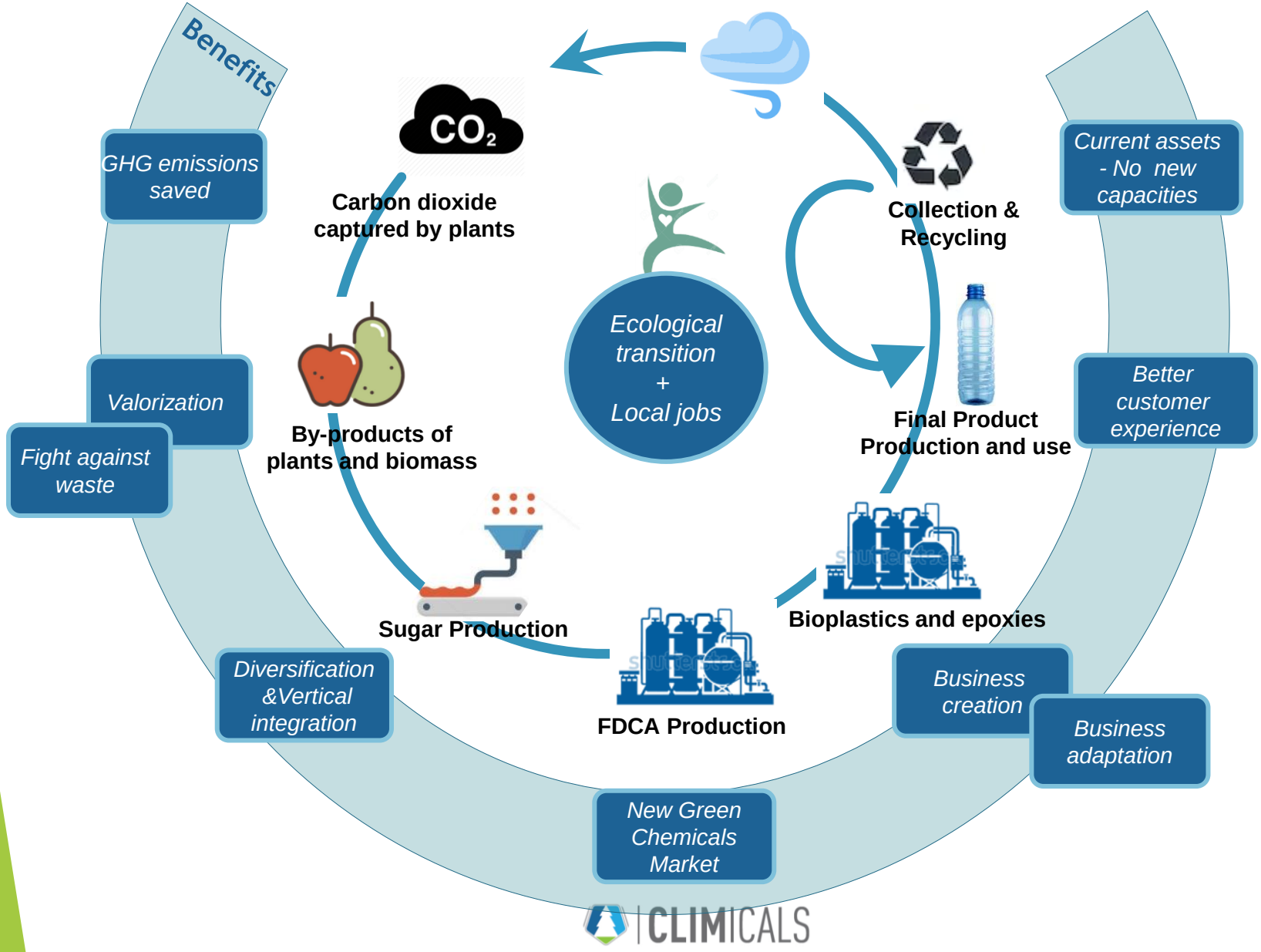





# We contribute to creating new models & circular business models dedicated to the ecological transition



# We contribute to a circular economy solution to plastics

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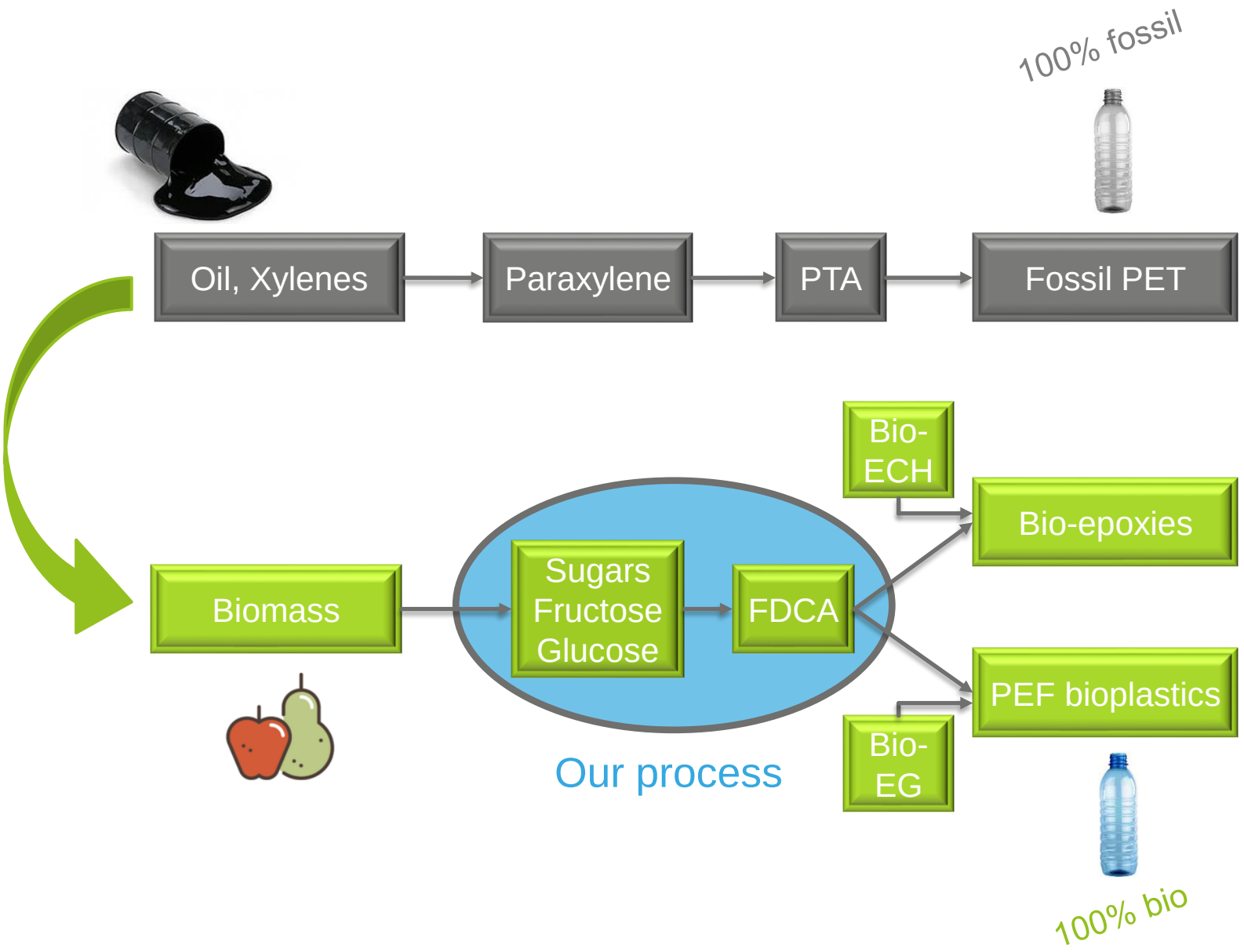
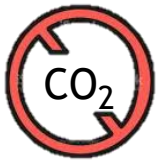
# The opportunity to transform the PET value chain



# Biobased epoxies are a revolution

**Current epoxies → 50% biobased maximum involve bisphenol A**

**FDCA enables production of biobased epoxies**




**100% biobased**
**No GHG emissions**

**No bisphenol A**

**Attractive properties**

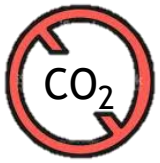
**Attractive Business Case**

**Existing and new potential markets: 1 million tons**

# 3D Printing, a huge emerging market

**Current materials do not fully satisfy 3D printing operators in terms of structural integrity, adhesion, thermoplasticity, sensitivity to solvents**

**FDCA enables production of performant and competitive bioplastics**




**100% biobased**
**No GHG emissions**

**High stability**

**Attractive properties**

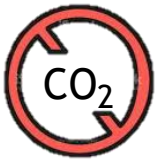
**Attractive Business Case**

**A strong leverage for circular economy**

# Agri-Food industry and distributors

## Current plastics are less and less accepted and aligned on the needs

**FDCA enables production of compatible bioplastics**




**100% biobased**
**No GHG emissions**

**Fight against waste**

**Attractive properties and shelf-life**

**Attractive Business Case**

**Existing and new potential markets: 500 million tons**

# Key benefits on key markets

| | Bio-based epoxies | 3D Printing | Agri food and distributors |
|---|---|---|---|
| Environment | $CO_2$ | $CO_2$ | $CO_2$ |
| Health | No bisphénol A | ✓ | Anti-bacteria barrier |
| Properties | High stability | Thermo-mechanics eff. | Shelf life increased |
| Business Case | | | |
| Circular Economy | | | |
| Local Development | | | |

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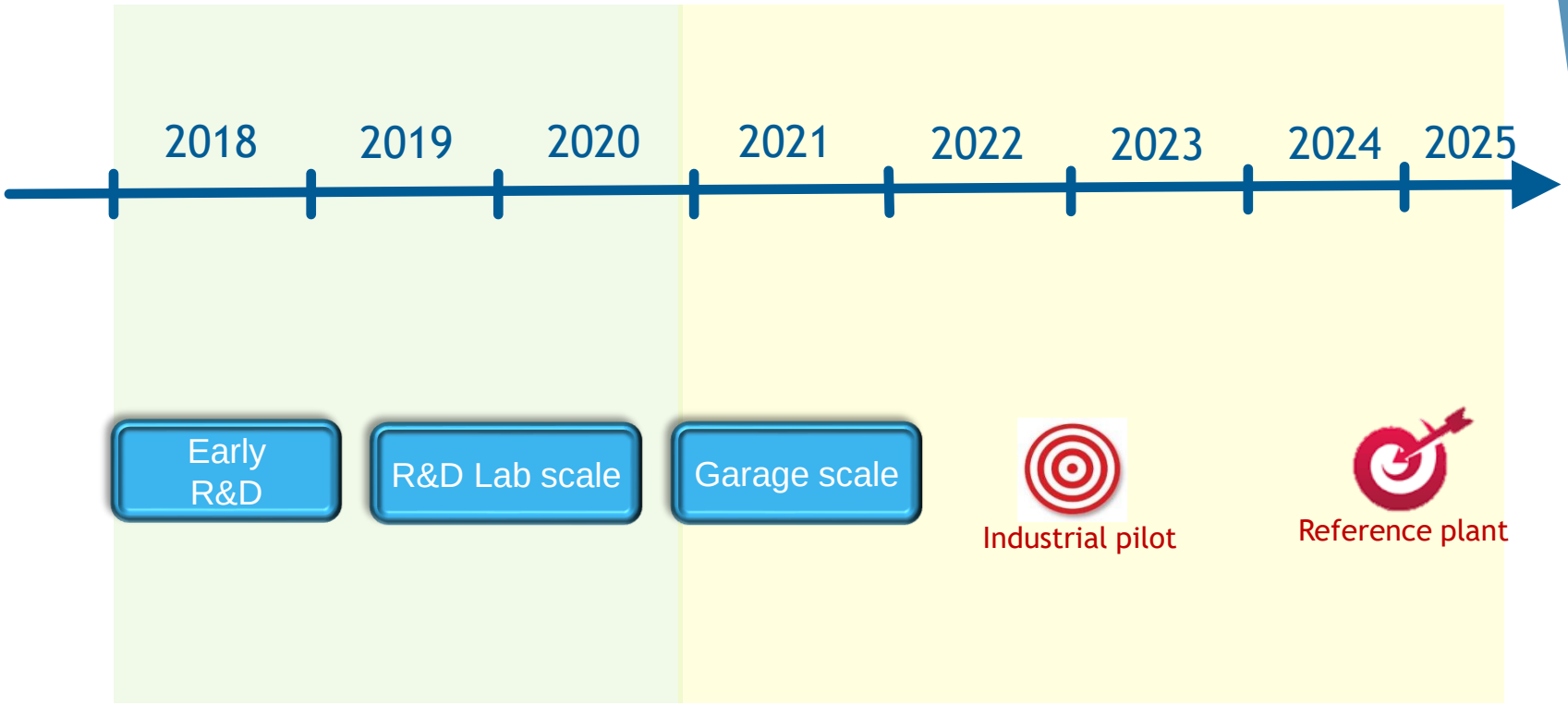
# Roadmap Timeline



# Creating new 100% plant based epoxies and bioplastics

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**Dedicated to FDCA and its direct applications**

**Need partners to go to…**

- **large scale**
- **lower cost**
- **circular economy**

***Opportunities to… assess applications, business cases, carve out IP position.***

***Opening new markets***

**YOU!**

**Need to…**

- **Increase market share in the ecological transition**
- **Or develop new sustainable products**

# The founders


Jérôme GOSSET
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- 20+ years in industrial R&D
- Founding member of MIR Innovation, AREVA H2Gen, MEDGRID
- Former CEO of AREVA Energy Storage
- Passionate about creating value in cleantech markets by unlocking the full potential of R & D
- Judoka


Thierry GERVAIS
Cofounder - Development
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- 25 years in business development in the innovative markets of ecological transition and IT
- Vice President of the Humaninnov Foundation
- Strongly animated to make a contribution to the environment - do not stay idle ...
- Skydiver

# Taking action for Climate!

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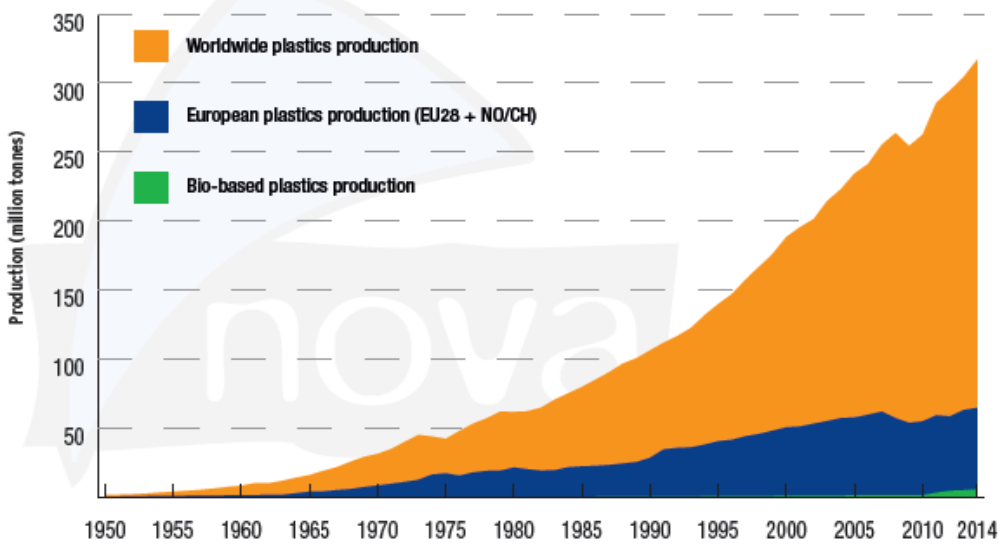
# Backup slides

Sept. 2020

# A Growing Plastics Market




- **In constant growth**
- **335 Mt/yr world the plastics production**
- **Despite environmental pressures, PET has seen largest increase in 10 years**
- **Bioplastics only 2% of total production**
- **Global plastic market expected to grow 4 times up to 2050**

- **In parallel, some key facts…**

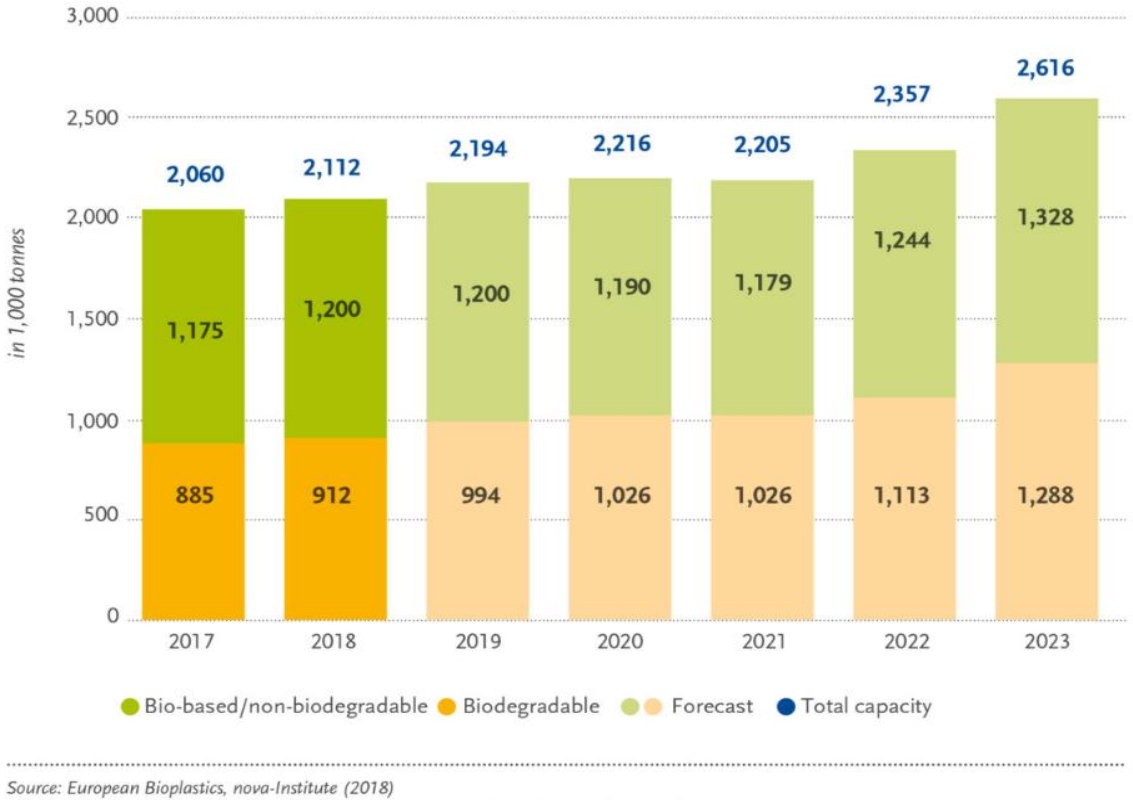
1. A carbon budget to limit the global warning to 1,5 °C has been set up for 13 years (extrapolating CO2 emissions)

2. 90% of the chemical products are derived from fossil carbon (11% of global primary oil demand)

3. Global awareness for environmental protection and consumers' willingness to reduce their environmental footprint are constantly increasing

# The Emerging Bioplastics Market

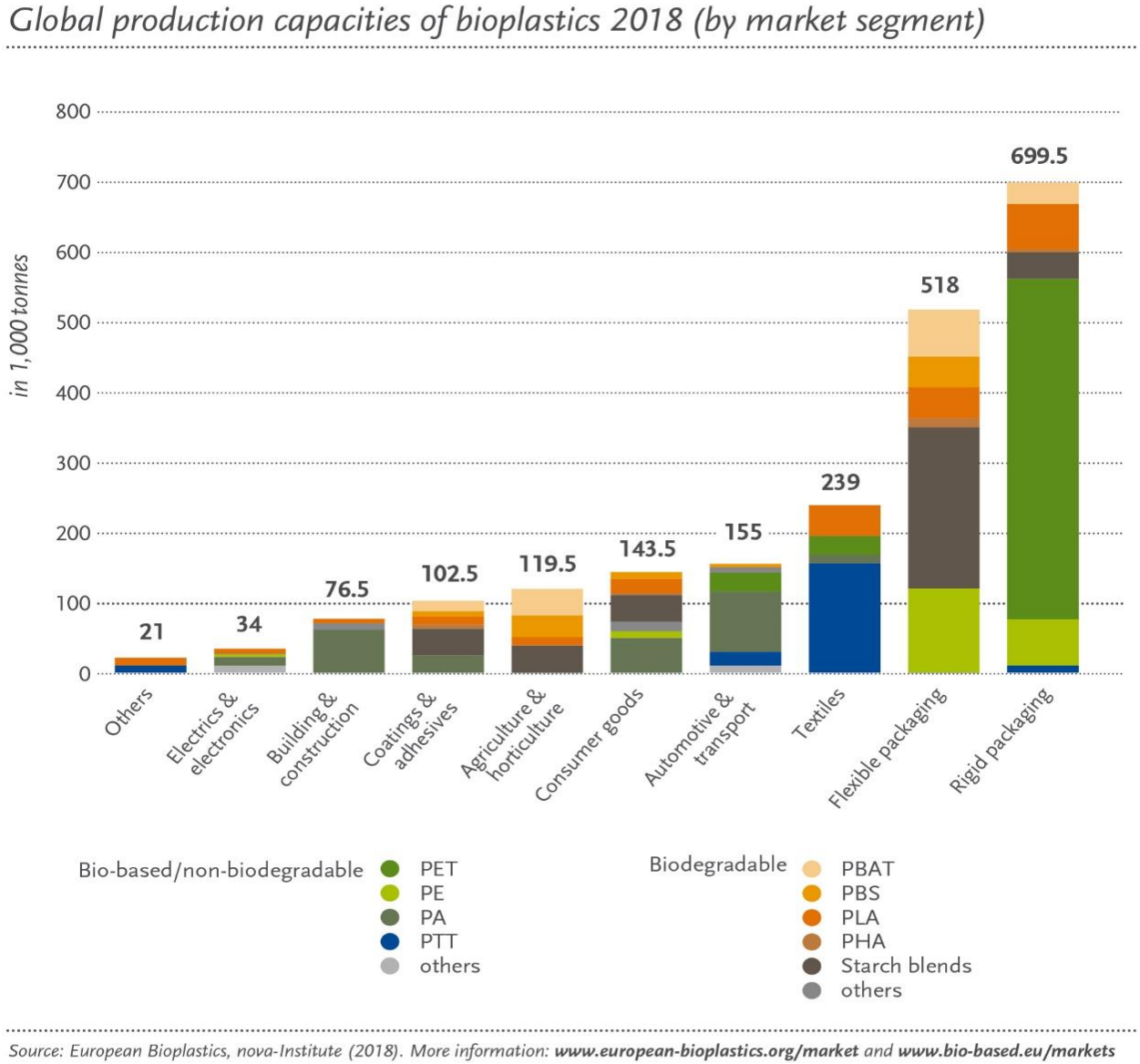
- **A 30% growth is expected during the coming 5 years**
- **Due to**
  - the technologies maturity
  - a growing consumer interest
  - the incentive policies
  - the improving competitiveness of bioplastics




Source: European Bioplastics, nova-Institute (2018)

- **Bioplastics to be optimized to meet the challenges of use, market price or versatility of applications**
- **The market players are looking for competitive & robust solutions that comply with regulations and sustainable development policies**

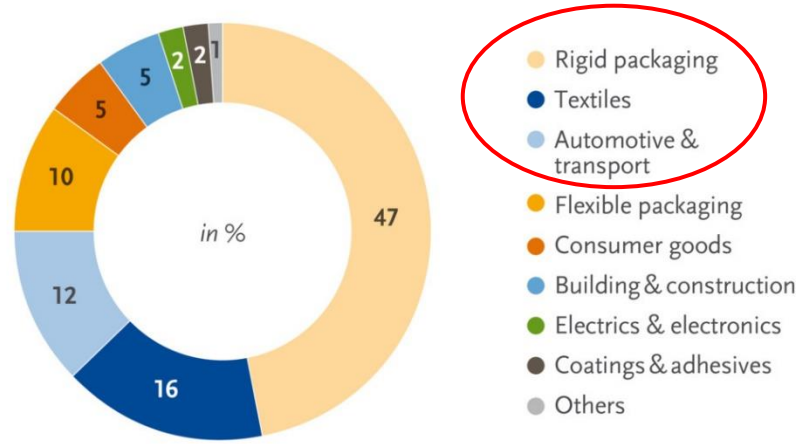
# A large panel of applications




**A bioplastic alternative for almost every conventional plastic material**

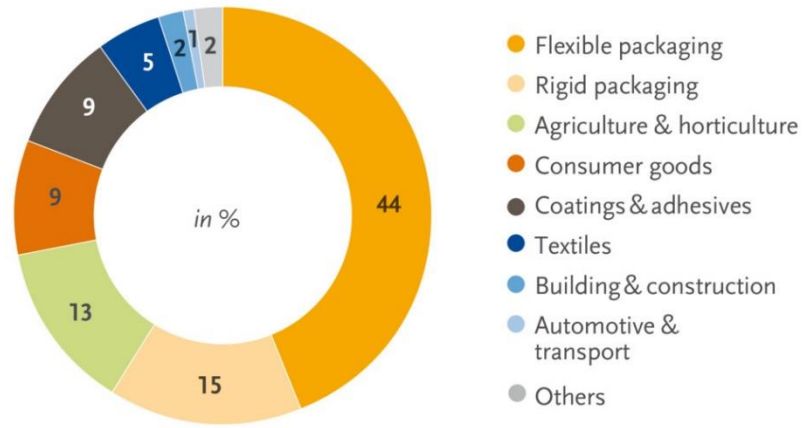
# Biodegradable and bio-based plastics are the winning picks

*Bio-based plastics (by market segment) 2018*




Source: European Bioplastics, nova-Institute (2018)
More information: www.european-bioplastics.org/market and www.bio-based.eu/markets

*Biodegradable plastics (by market segment) 2018*

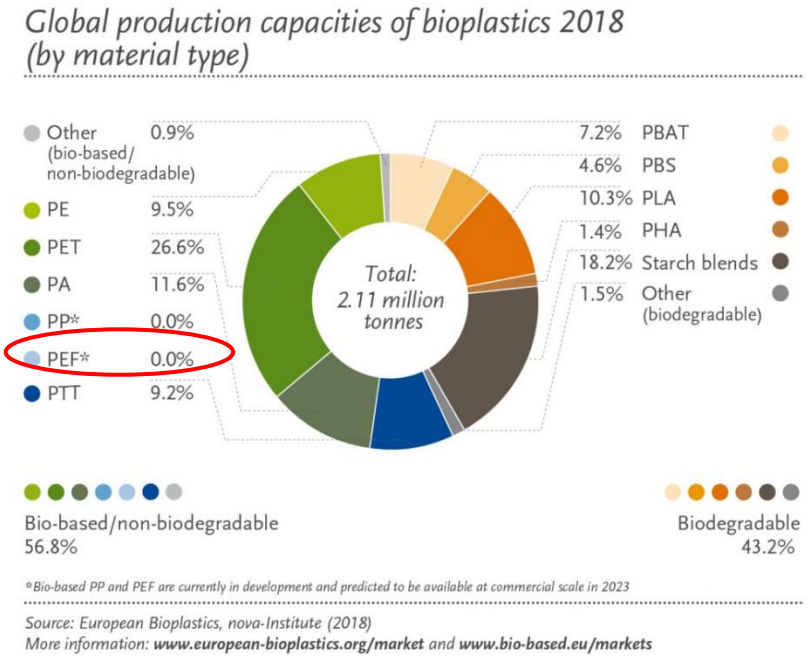


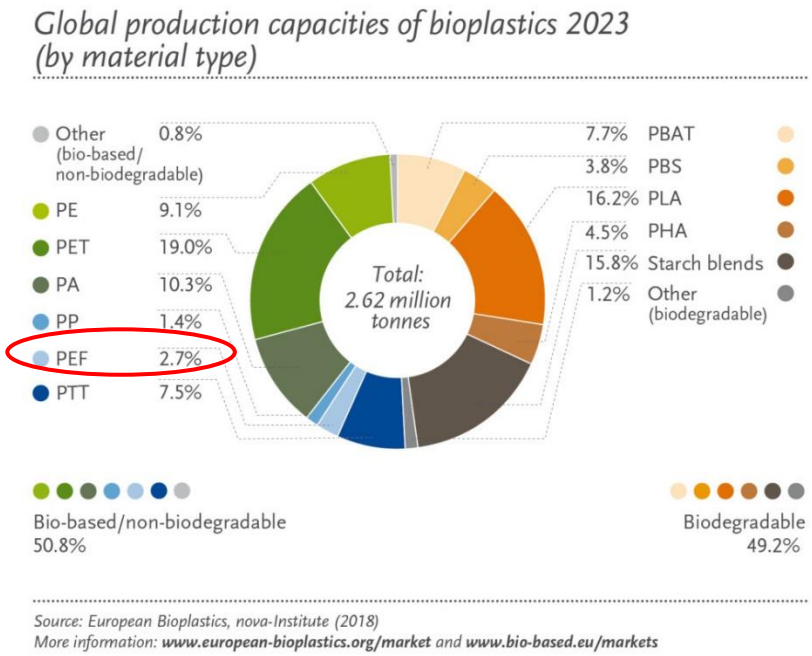

Source: European Bioplastics, nova-Institute (2018)
More information: www.european-bioplastics.org/market and www.bio-based.eu/markets

- **Considering the applications they can address, bio-based and biodegradable plastics are complementary**
  - Biodegradable plastics: Mainly designed for industrial compost facilities (ex. PLA), desirable only for specific applications: diapers, cigarettes, bags for food (dry, waste)
  - Biobased plastics are expected to address rigid packaging, textiles, transports…

# PEF is very much desired

- **A new bio-based polymer with strong features similar to bio-PET**
  - Fully recyclable
  - 100% bio-based
  - Providing complementary added values : barrier properties, insulation, weight



# Value Proposition for Plastics Producers

- **Incumbent PET producers**
  - Adapt their production assets to the new market conditions
  - Shift from fossil to renewable feedstocks
  - Modernize their image
  - Explore new business models

- **Future pure PEF producers**
  - Decrease their total cost thanks to a low cost FDCA process
  - Reach the market targets and win new market shares

- **Biorefineries**
  - Extend their scope of work to sugar market
  - Be a new key actor in the local sustainable development

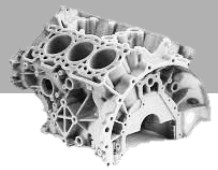
# **CLIM**ICALS stands out of the Competition

| COMPETITION | | CLIMICALS |
|---|---|---|
| Direct Competition | • Aiming large FDCA Production<br>• 5 main players<br>• Linear economy<br>Centralized processes | Scalable and circular Process |
| Incumbent Oil based industry | • Low oil prices<br>• Installed PET production base<br>• Installed recycling capability & networks<br>Fossil-based | Low Cost Strategy |
| Alternative Bio-based Products | • Other bio-based polymers<br>Expensive Not generic | PEF vs PET<br>Best Market Segments Selection |

Our Strategy

# Business Vision

- **Promote innovative circular economy models**
  - CLIMICALS will propose or implement new local value chains
    - **Developing partnerships with**
      - **Agriculture and biomass producers**
      - **Sugar producers**
      - **Engineering companies**
      - **Packaging producers (plant adaptation or new build), biorefineries**
      - **Communities**
      - **Recycling companies**
  - Become an international key player providing licenses of FDCA production process
- **Enable material manufacturers to sell competitive PEF bioplastics in 4 main markets**

| Food & Beverage | 3D Printing | Automotive & Aerospace | Textile |
|---|---|---|---|
| Increase shelf life  | Fully local, competitive and circular economy  | Reduce weight + Improve mechanical/thermal performances  | improved thermal insulation  |

# Our Company

# Development milestones reached so far

- **Technology**
  - R&D Lab scale performed; scientific feasibility proved
  - Ongoing 200 k$ R&D program with 60 % public funding secured
  - 1st commercial plant engineering study completed
  - 1st amounts of FDCA produced, with growing measured selectivity
- **Commercial**
  - Preliminary Market Assessment, confirming market value of competitively priced FDCA
  - 1st LoIs from PET end-users
  - 1st MOUs with stakeholders on going
- **Corporate**
  - Company incorporated in June 2018, shareholder agreement is in place
  - Franco-Canadian team of two partners, in order to address the North American and European markets as a priority
  - 1st fundraising performed in June 2020
  - Public funding obtained for engineering activities from CRIBIQ (R&D funding agency for bio-processes), and the Ministère de l'Économie du Québec.
  - Partnership with academic team secured, growing number of contributors