european bioeconomy university

Parallel Session

Educate system changers: novel educational concepts and required skills profiles

Bioceb: European Master in Biological and Chemical Engineering for a Sustainable Bioeconomy

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And all Bioceb contributors from AgroParisTech and partner institutions:

- Université de Reims Champagne-Ardenne (URCA)
- Université de Liège (ULiège)
- Aalto University
- Tallinn University of Technology (TalTech)

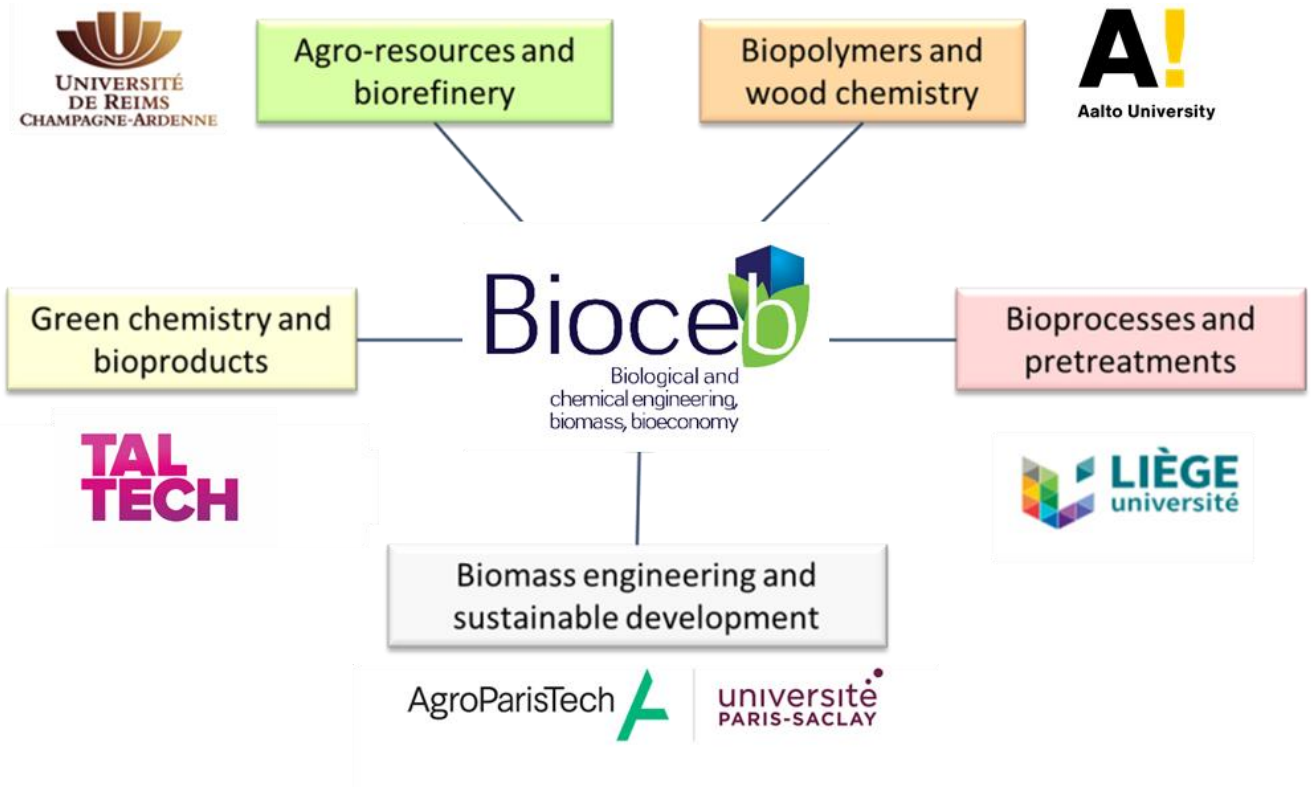
AgroParisTech
Talents for a sustainable planet

Bioceb
European Master in Biological and Chemical Engineering for a Sustainable Bioeconomy

With the support of the Erasmus+ Programme of the European Union

Bioceb consortium

- **5 European Higher Education Institutions with complementary expertises**



Meeting the needs for bioeconomy skills

Needs highlighted by many reports at European, national and institutional levels, such as:

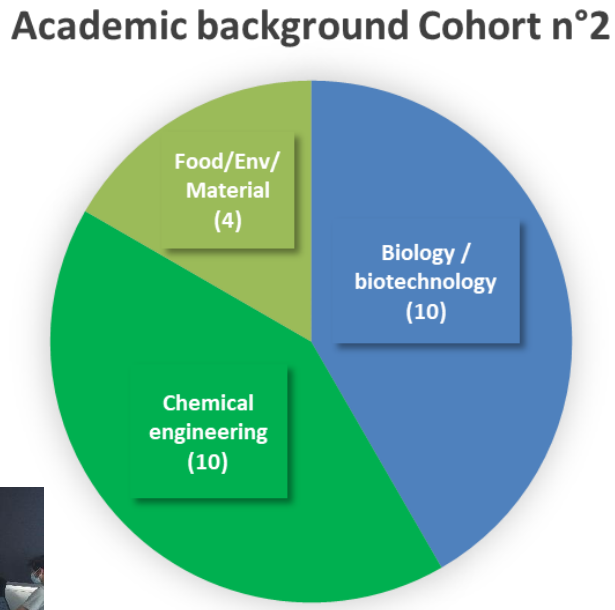
- 2017 Review of the European Bioeconomy Strategy
  - “the successful integration of bioeconomy skills in higher education is a pre-requisite for enhancing Europe’s S&T base and supporting the uptake of innovation for the bioeconomy”
- 2018 Update of EU Bioeconomy Strategy:
  - “need of all sort of professionals, including some that possess multidisciplinary, managerial and cross-sectoral expertise acquired in a higher education setting”
  - “graduates having an in-depth knowledge in a certain domain […] but also an understanding of the broader bioeconomy and supporting and emerging fields […] are needed”.
- French Bioeconomy Strategy:
  - “these approaches require a constant de-compartmentalization of disciplines (…) a global and integrated approach was still lacking in the field of bioeconomy”
- AgroParisTech Green Chemistry Prospective Committee (on future jobs and skills)
- Experience as coordinator of Zelcor project

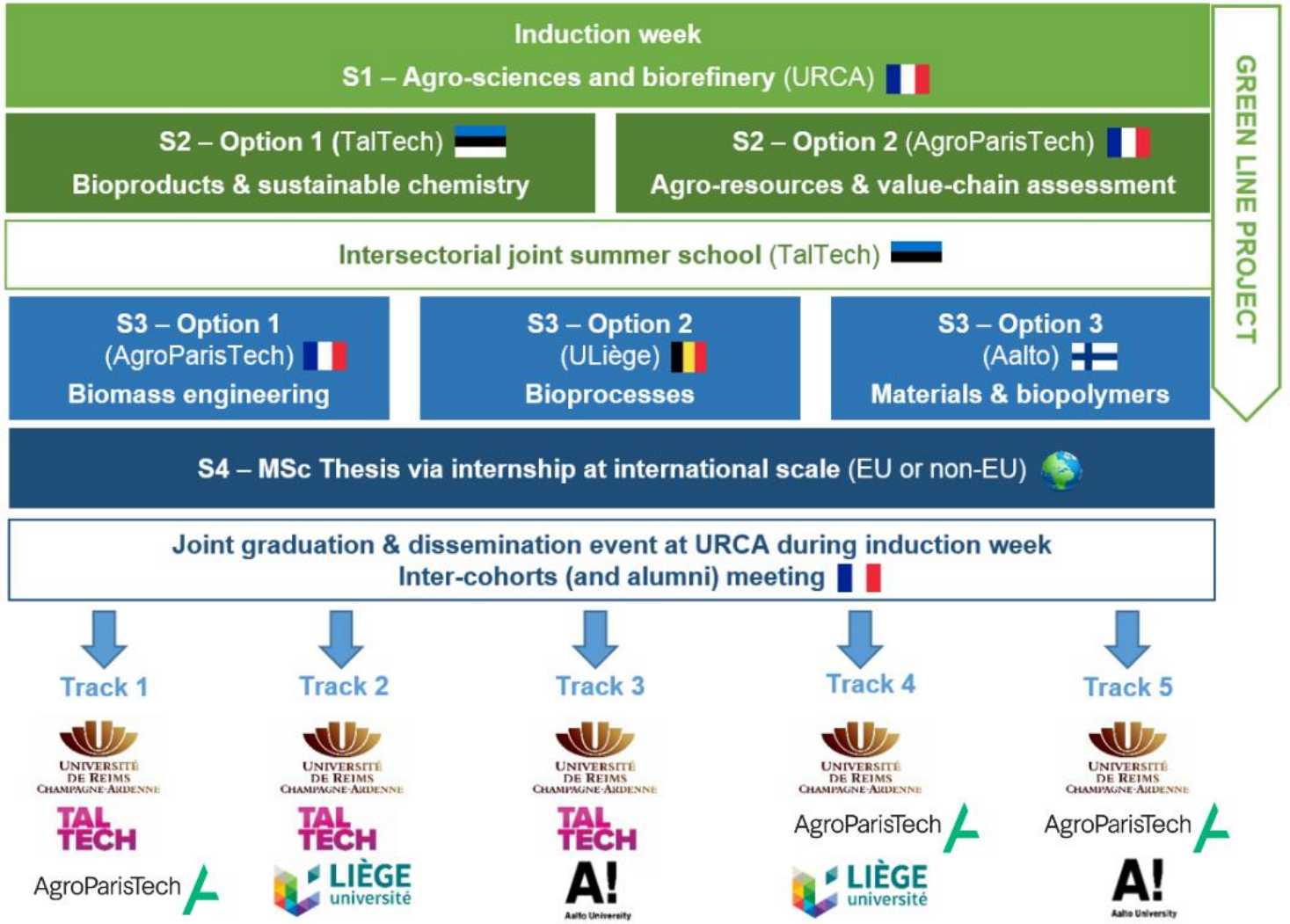
Principles on which Bioceb was built

- We should design a 2-years programme covering a broad number of disciplines and soft skills, while offering strong technical specialisations.
- This master programme should be developed as a joint effort, building on the strengths of different European Universities
  - URCA, Uliège and Aalto were already AgroParisTech partners
- It should be international, in order to broaden perspectives (both in terms of bioeconomy models and intercultural experience) and include the best talents from all over the world.
- Erasmus Mundus scheme has proven to be an effective tool for international English-taught masters development at AgroParisTech

What is Bioceb?

- A flexible programme dedicated to a mixed public of graduates (Chemical engineering, Biology and Biotechnology, Food, Material and Environment Science)
  - A joint pluridisciplinary first semester
  - A progressive specialization
  - Joint events and projects in groups
  - Interculturality training





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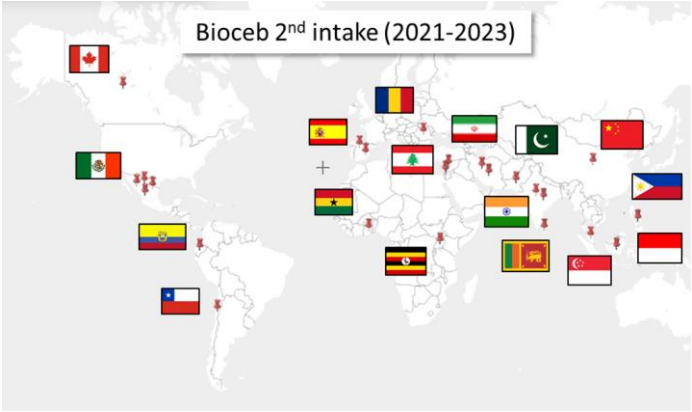
Results since the launch of the programme

- ~ 150 applications per year
- Intakes of ~ 25 students from 5 regions of the world
  - Africa (Ethiopia, Ghana, Uganda)
  - Asia (China, Philippines, India, Indonesia, Sri Lanka, Pakistan)
  - Europe (Greece, Italy, Romania, Serbia, Spain)
  - Middle East (Iran, Lebanon, Yemen)
  - North and South America (Canada, US, Mexico, Brazil, Columbia, Chile, Costa Rica, Ecuador)

20 EU scholarships per intake + self-paying students



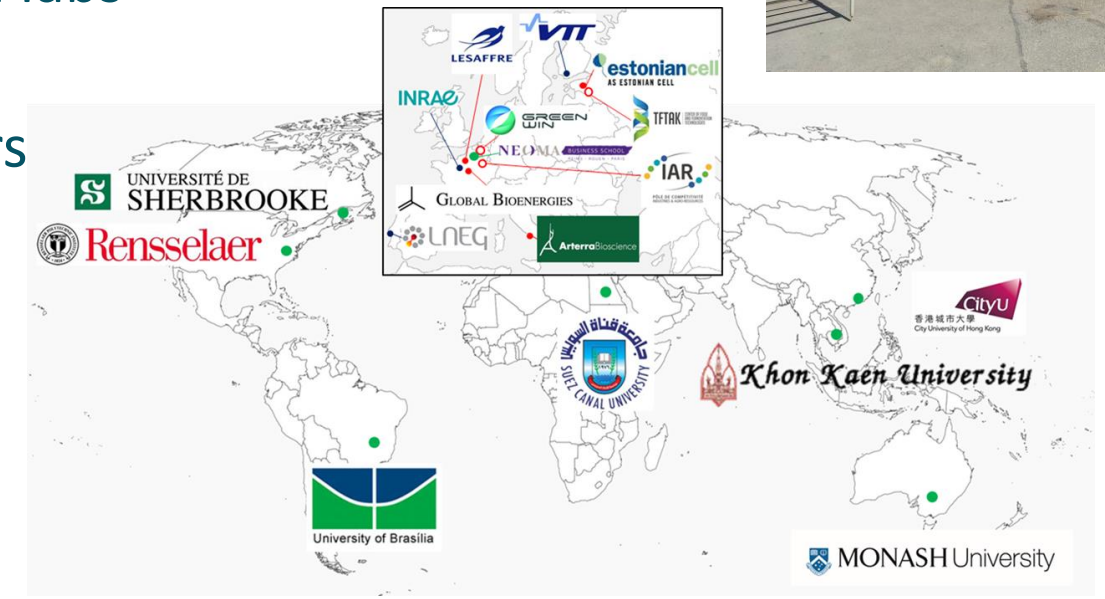
Results since the launch of the programme

- 11 Green Line Projects involving ~ 20 teachers and researchers
  - Eco-friendly solutions for **plant health** based on phenolic extracts
  - Combined plant selection and pre-treatment to optimise **lignocellulose valorization**
  - **Lignin engineering** for the production of a multifunctional additive
  - Lignocellulose as a source of **lignin and hydrogen**
  - Production of active ingredients for **kerosene** by lignin conversion
  - Production of **bio-based polyesters** from agricultural by-products
  - Chemical valorization of **cellulose in ionic liquid** environment
  - Integrative process for the **microbial production and extraction of molecules of interest**
  - Combined **metabolic and process engineering** to convert a by-product into a value-added chemical
  - Sustainable bio-manufacturing for the production of **food and feed ingredients**
  - **Nanocellulose** production, properties and market opportunities

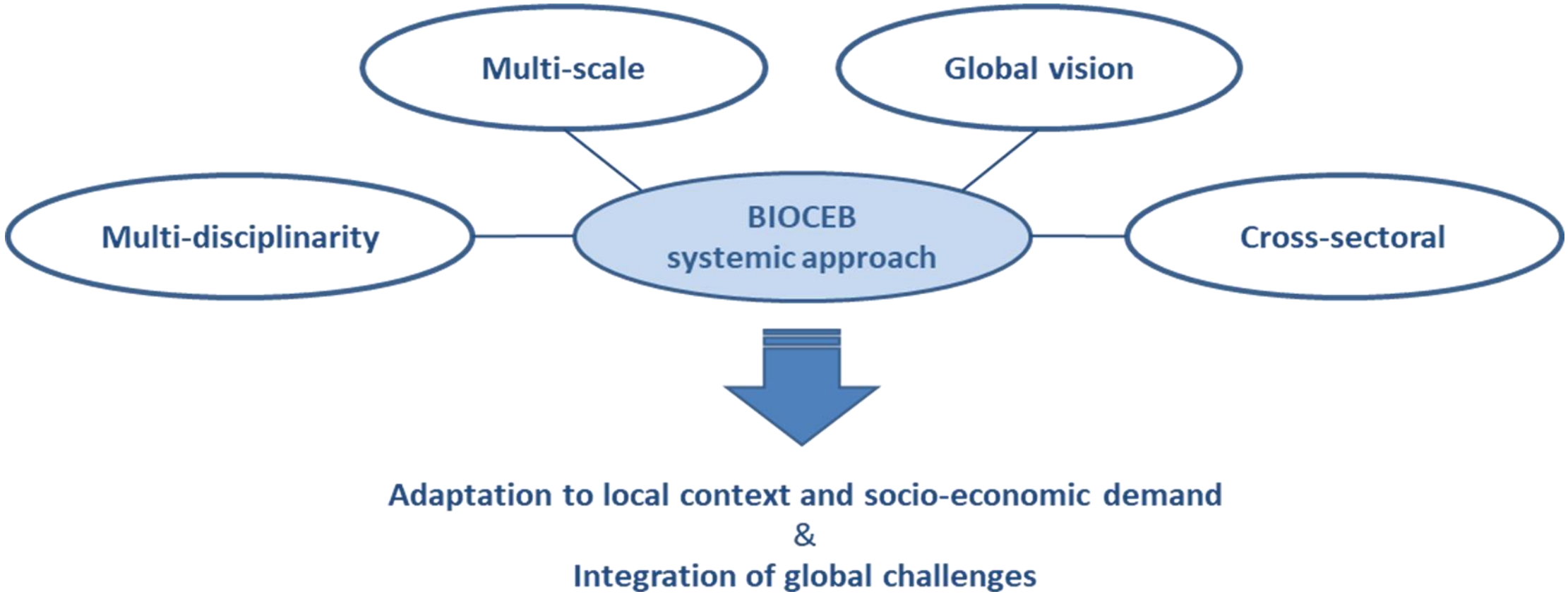
Presentation at 3 GLP forum

Results since the launch of the programme

- 1st summerschool organized in TalTech (June 28th-July 2nd)
  - Lectures
  - Visit of industrial sites and research labs
  - Poster presentations by students
  - Exchange with 6 associated partners



Conclusion


Multi-scale
Global vision
Multi-disciplinarity
BIOCEB
systemic approach
Cross-sectoral
Adaptation to local context and socio-economic demand
&
Integration of global challenges