

RESOURCE EFFICIENCY
Using less, living better



Outline of the EuroBioRef Project

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Speaker: Michele Aresta (CIRCC-IT)



Brussels, 24-27 May 2011

7th FP Call

Call of the 7th Framework Programme : COLLABORATIVE PROGRAMME

Joint Programme FP7-2009-BIOREFINERY-CP

- Nanosciences, Nanotechnologies, Materials and new Production Technologies
- Energy
- Food, Agriculture and Fisheries, and Biotechnology
- Environment (including Climate Change)



The four Sister Projects

4 years

2 years



Franck Dumeignil



<http://eurobioref.org/>

37.4 M€

23 M€

28 Partners
14 Nationalities



Mickaël O'Donohue



www.biocore-europe.org

20.3 M€

14 M€

24 Partners
13 Nationalities



Ashok K Bhattacharya



www.suprabio.eu

19 M€

12,5 M€

17 Partners
8 Nationalities



Johan Elvnert



www.star-colibri.eu

2.4 M€

2 M€

12 Partners
6 Nationalities

A Large-Scale Project

- 28 Partners



- 14 Nations



- 4 Years



- 3,344.4 Person Months



- 38 M€ of Global Budget, 23 M€ of EC grant



- 10 Sub-Projects, 35 Work Packages, 153 Tasks



- 59 Milestones

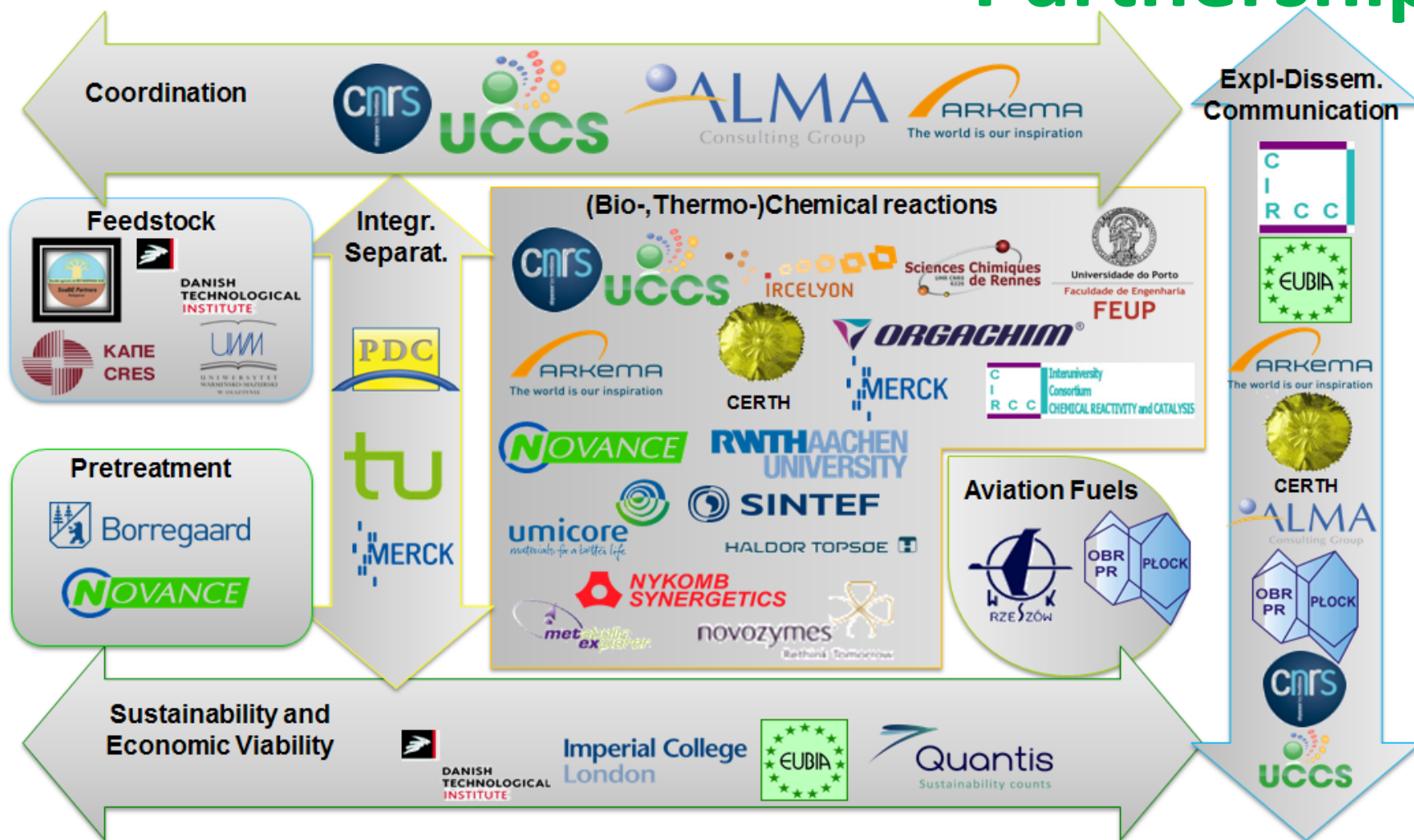


- 214 EC Deliverables

Consortium



Competencies within the Partnership



Preamble



An Integrated European BioRefineries Network

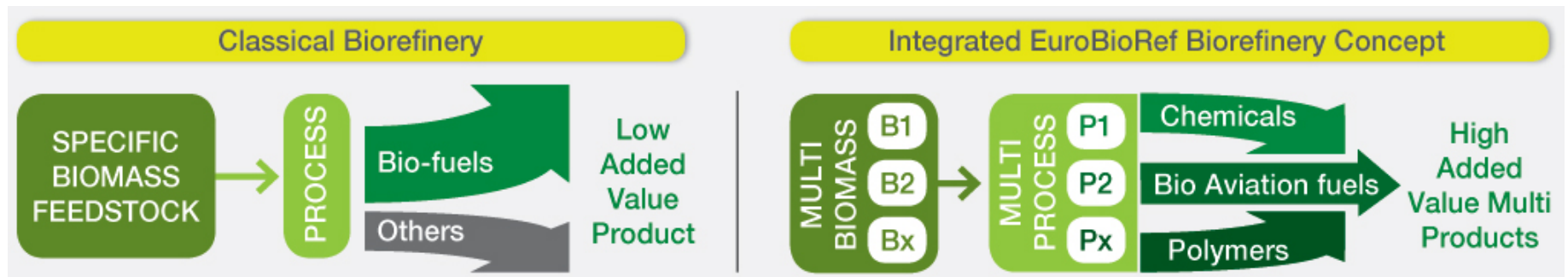
Start date: 1st March 2010



Duration: 4 years

Next Generation Biorefinery

EUROpean Multilevel Integrated BIOREFinery Design for Sustainable Biomass Processing



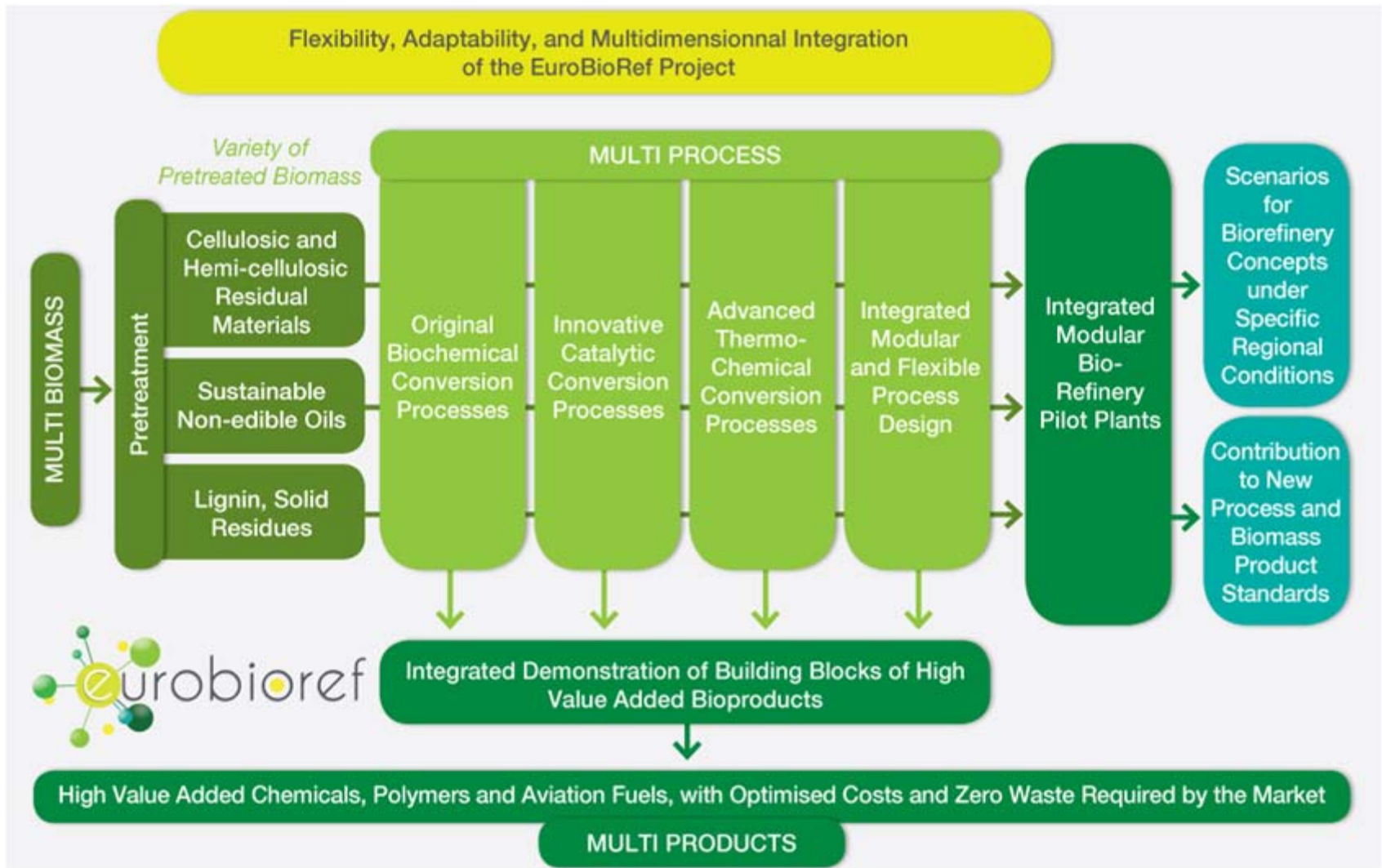
EuroBioRef will bridge the gap between agriculture and chemical industry by integrating the whole biomass chain in a Multi-feedstock (non-edible), Multi-process (chemical, biochemical, thermochemical), Multi-products (aviation fuels and chemicals) commercially viable and adaptable approach for a sustainable bio-economy in Europe.

Objectives

- Produce a large diversity of sustainable biomass
- Produce high energy aviation fuels
- Produce multiple products
- Improve cost-efficiency by 30 %
- Reduce by 30 % the amount of needed energy
- Reduce time-to-market by 30 %
- Produce zero waste and rationalize the use of raw materials



Concept



OIL PLANTS



Lesquerella



Lunaria



Jatropha



Castor



Safflower



LIGNOCELLULOSICS



Willow



Switchgrass



Miscanthus



Black locust



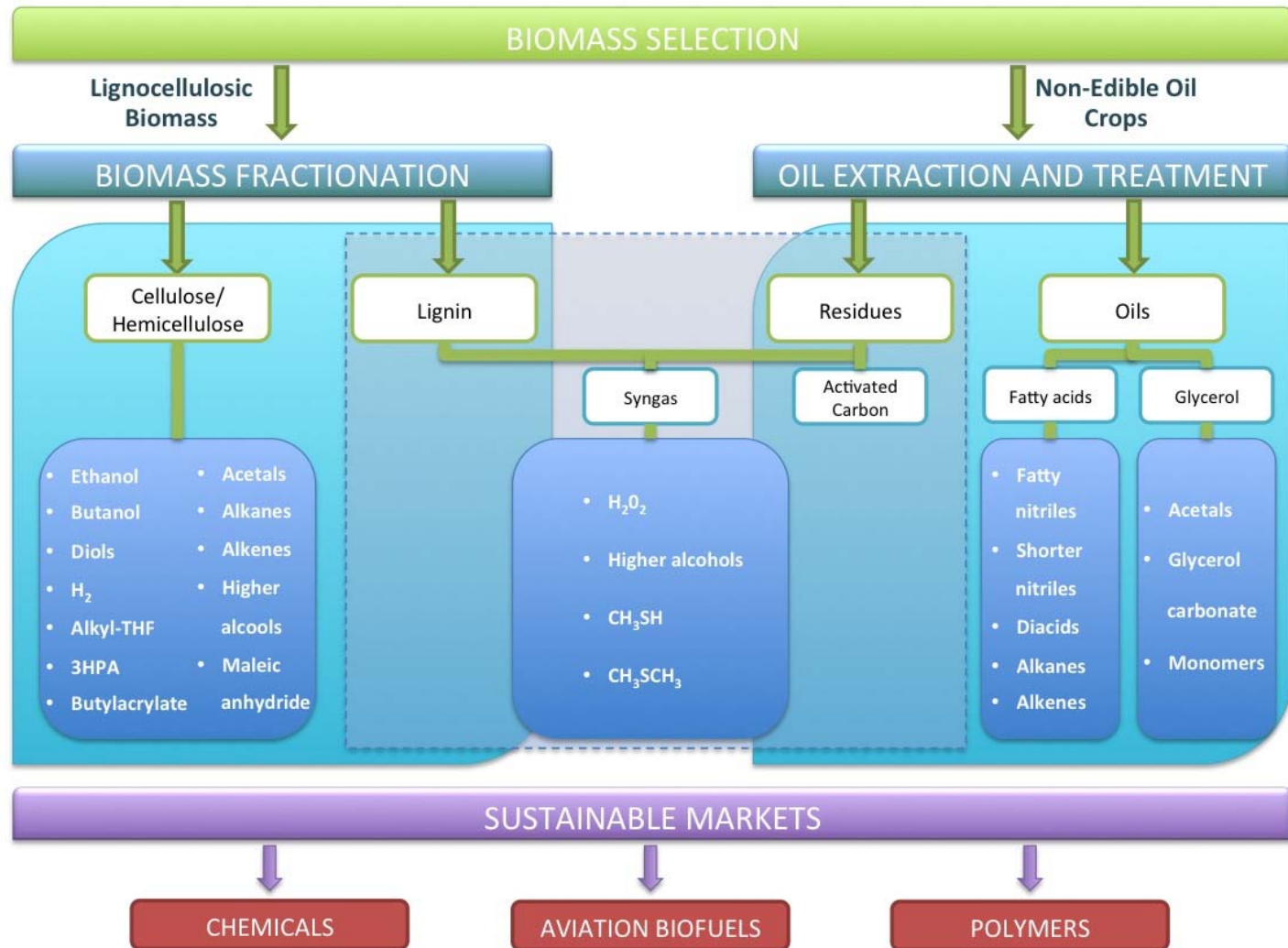
Cardoon



Giant reed

**RESIDUAL MATERIALS FROM
AGRICULTURE AND FORESTRY**

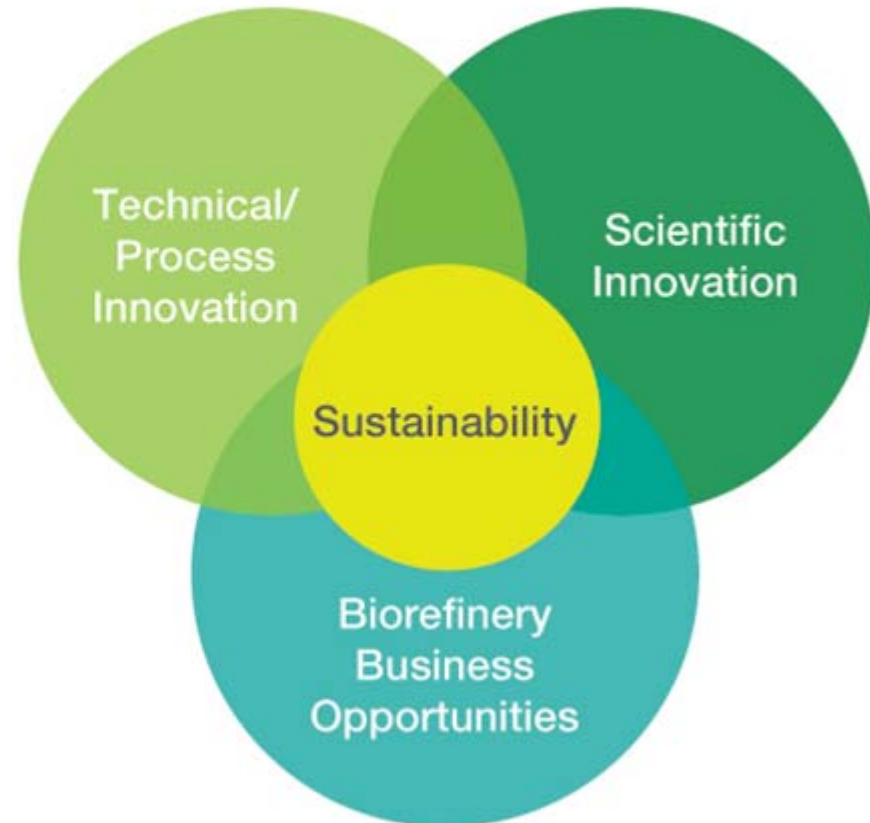
Target products



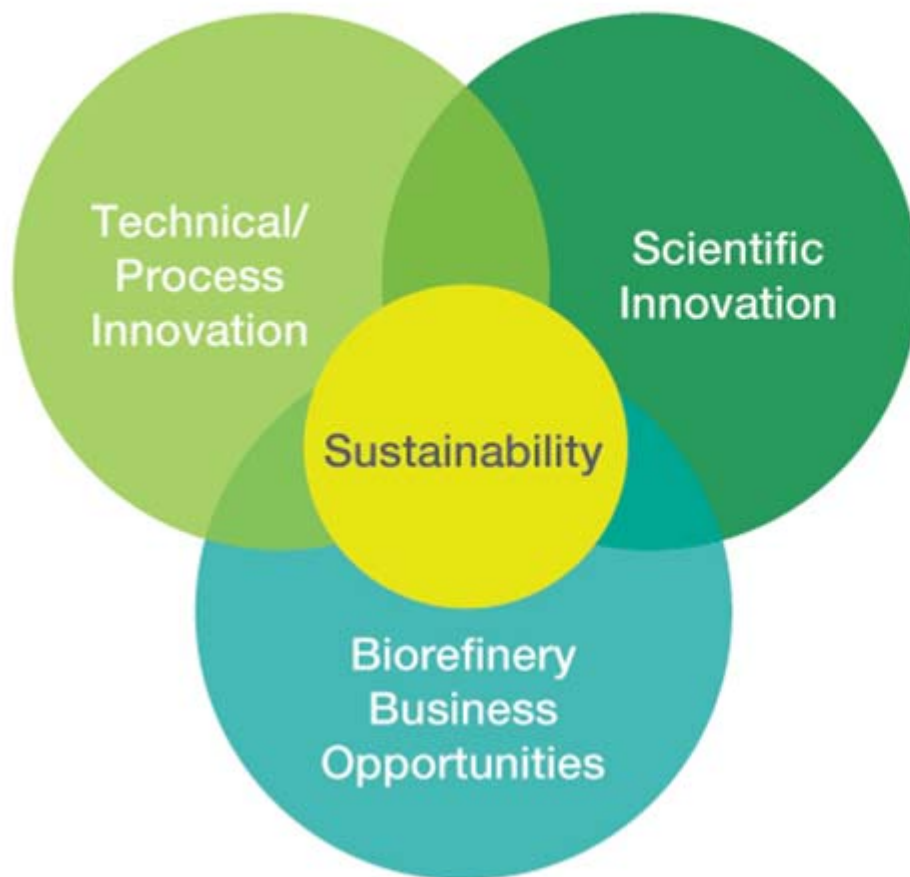
Technical Advancement

Technical Advancement

- Crop rotation optimization, selection of appropriate sustainable biomass feedstock;
- Rationalization/optimization of chains including logistics and LCA considerations;
- Quality control of a variety of feedstock for a variety of end-products;
- Elaboration of multidisciplinary processes combining various technologies;
- Demonstration of sub-units at the lab-scale, the pilot scale, the industrial level;
- Integration of several reactions and separation steps.



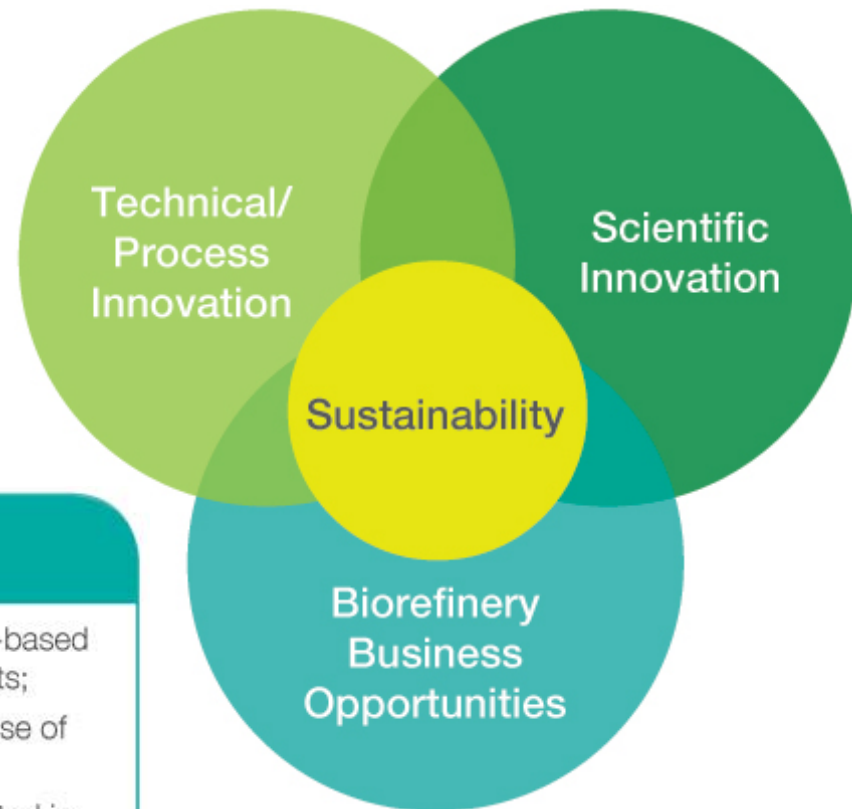
Scientific Innovation



Scientific Innovation

- Methods for conceptual process design in the chemical sector towards bio-/chemical applications;
- Novel heterogeneous, homogeneous, enzymatic catalytic systems;
- Novel low energy separation techniques;
- Novel reactor technologies;
- Co-products reutilization/valorisation technologies;
- Integrated reactions and separation technologies;
- Development of new purification technologies using green solvents.

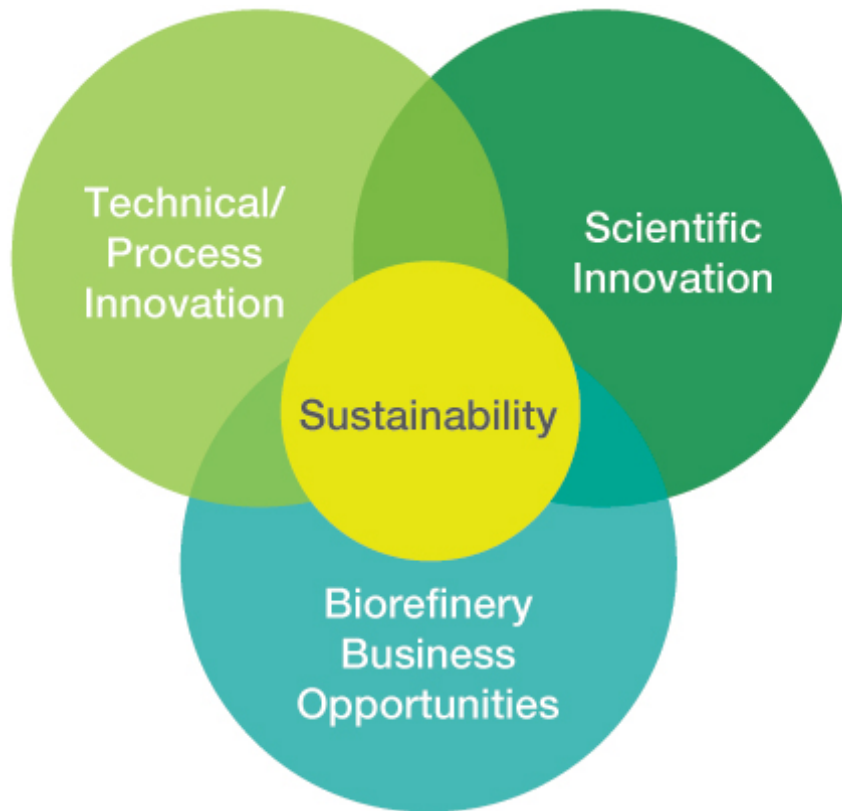
Expected Business Results



Expected Business Results

- Demonstration of the economic and technical over performance of bio-based products including bio-aviation fuels and chemical commodities markets;
- Demonstration of the increase in economical performance due to the use of second generation feedstock;
- Demonstration of the sustainable value chain of non-food crops cultivated in synergy with food-crops;
- Definition of final products specifications and tests of new products (blend of several components to yield bio-aviation fuel).

Sustainability Assessment and Performances



Sustainability Assessment and Performances

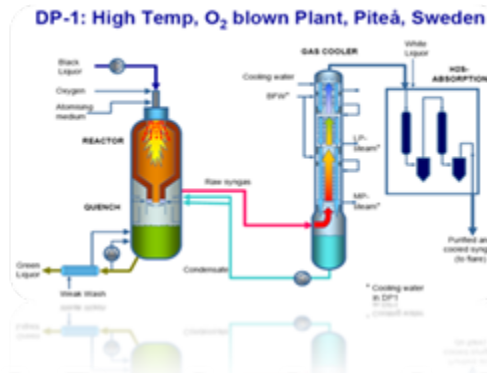
- Specific logistics methodology for cultures in North and South of Europe;
- LCA methodology for evaluation of environmental performances;
- Economic modelling for assessment of the economic viability;
- Sustainable assessment of the whole chain for economics.

First year results

- **Non-edible crops grown in field tests.** We are seeking seed providers;
- **Strategy for culture rotations and combinations:** on the way for finding synergies between edible and non-edible crops;
- Non-edible crops: **additional revenues for farming communities** generated from new side-businesses;
- Development of an **efficient and versatile pre-treatment technology for lignocellulosic materials:** further evaluated in a pilot plant in Norway.
- **Extraction of castor, jatropha and lunaria oils;**
- Strong integration of the thermochemical, chemical/catalytic and biochemical processes: some **lab work is already ready for demonstration;**
- **LCA** (carbon footprint + socio-environmental and economic impact assessments): **specific tools being developed; harmonisation efforts with major sister projects in the EU;**
- Strong power of **dissemination and education**, *e.g.*, first EuroBioRef **Summer School** on the 18-24th September 2011, Italy (see <http://eurobioref.org>). A **textbook** will be edited for this occasion.

Common Goal

EUROpean Multilevel Integrated BIOREFinery Design for Sustainable Biomass Processing



Common Goal: Producing Aviation Fuels Blends as well as Chemicals



Acknowledgement

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