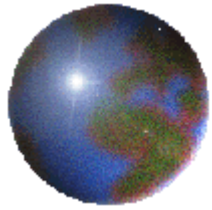


**Agri-Food Waste Day Conference  
Brussels, October 17, 2017**



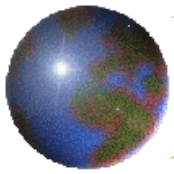
# **Agrifood waste exploitation: state-of-the-art and new opportunities, also in the frame of Horizon2020 and the PPP BBI**

**Fabio Fava**

University of Bologna, Italy & Italian Representative, i) *Horizon2020 SC2* Programming Committee; ii) "States Representatives Group" of *Public Private Partnership Biobased industry (BBI JU)*; iii) *BLUEMED Initiative* Strategic Board

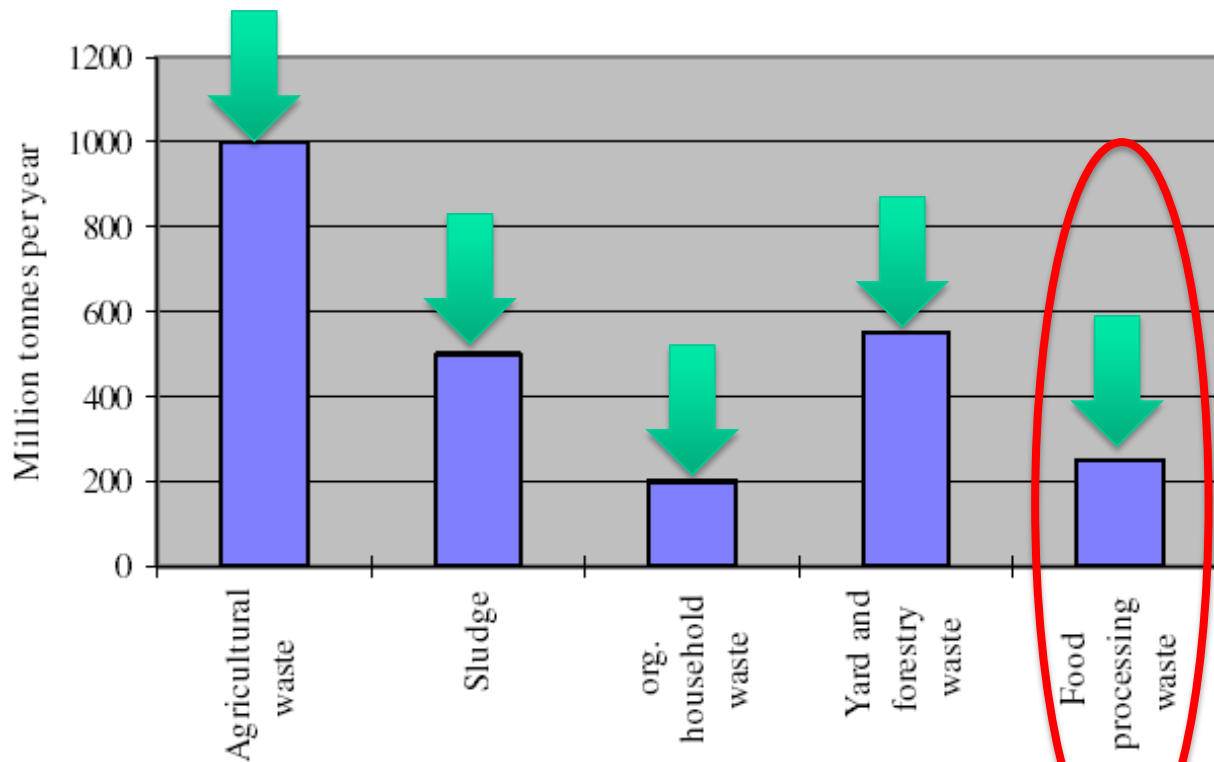
**David Bolzonella**

University of Verona, Italy

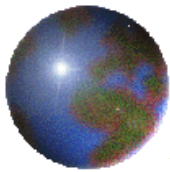


# Biowaste in Europe

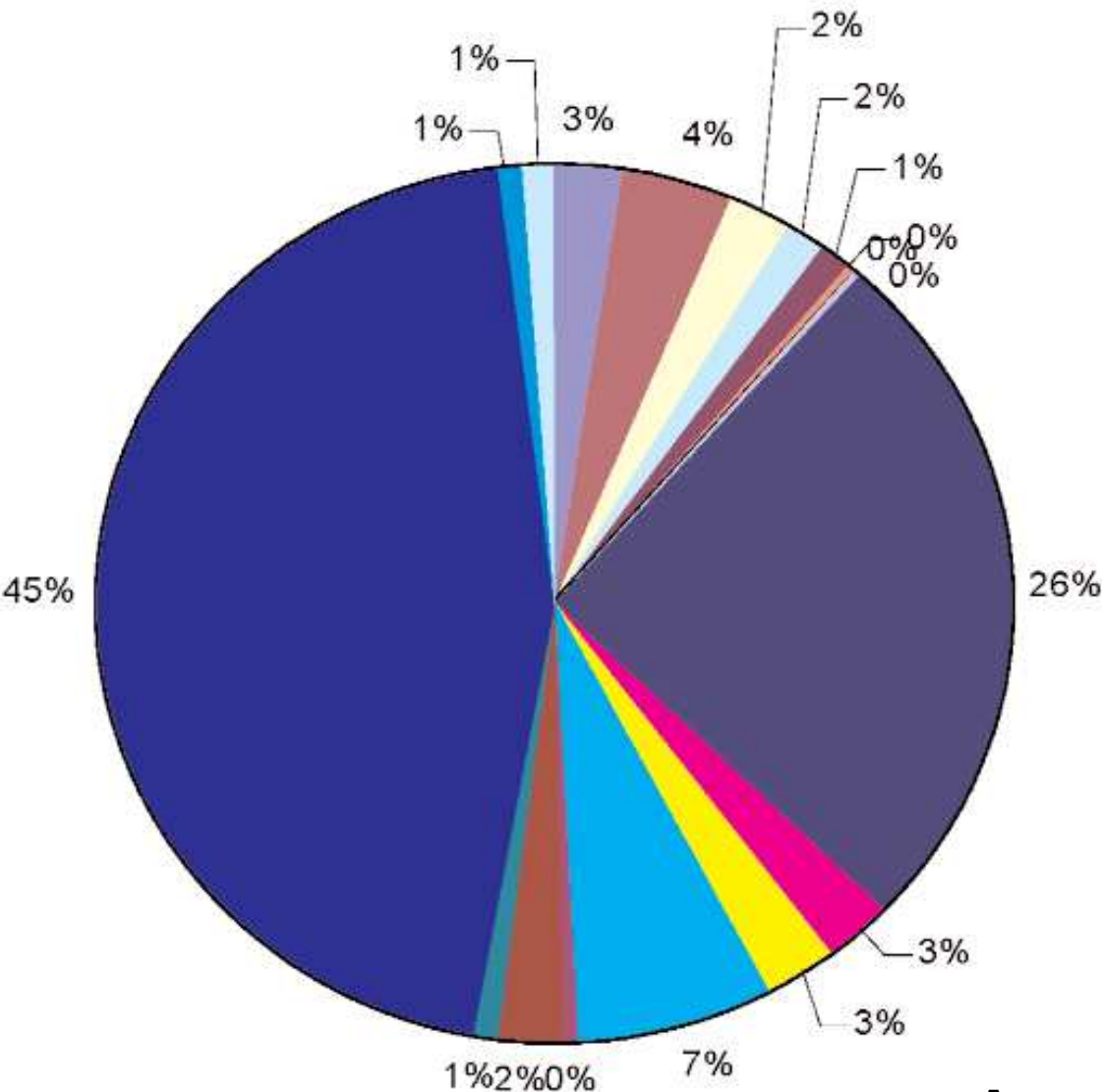
## Annual organic waste streams in the EU



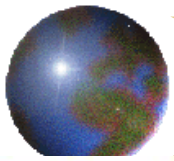
- Homogeneous streams suitable for processing;
- Streams rich of highly valuable compounds;
- They adversely affect the environmental sustainability of the food industry (the first industrial sector in EU with 1.000 bil €/y turnover).



# Food By-products and Waste



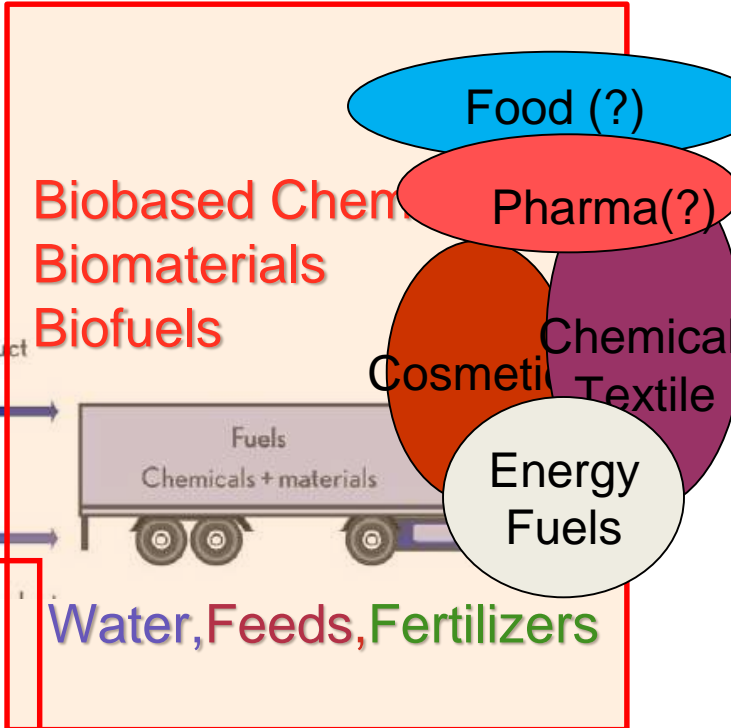
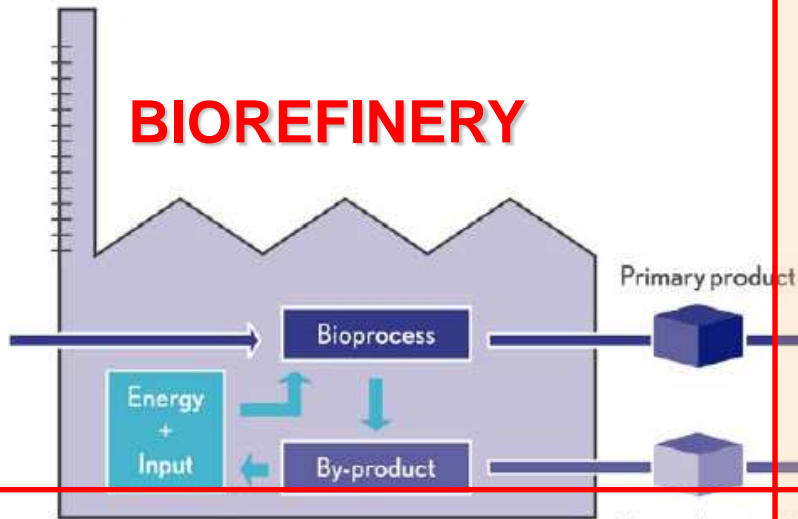
- Beef Slaughterhouse (Bovine)
- Pig Slaughterhouse
- Poultry Slaughterhouse
- Fish filleting, curing, salting and smoking
- Fish Canning
- Preserved crustacean and mollusc
- Fresh, frozen, dried salted or in brine crustacean and mollusc
- Yoghurt Production
- Fresh, soft and cooked Cheese production
- Fruit and vegetables Processing and preservation
- Fruit and vegetables Juice production
- Vegetable oil production
- Com Starch production
- Potato Starch production
- Wheat Starch production
- Sugar production
- White wine
- Red wine



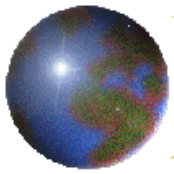
# Biowaste Biorefineries

Towards a bio-based society: an integrated, multipurpose biorefinery

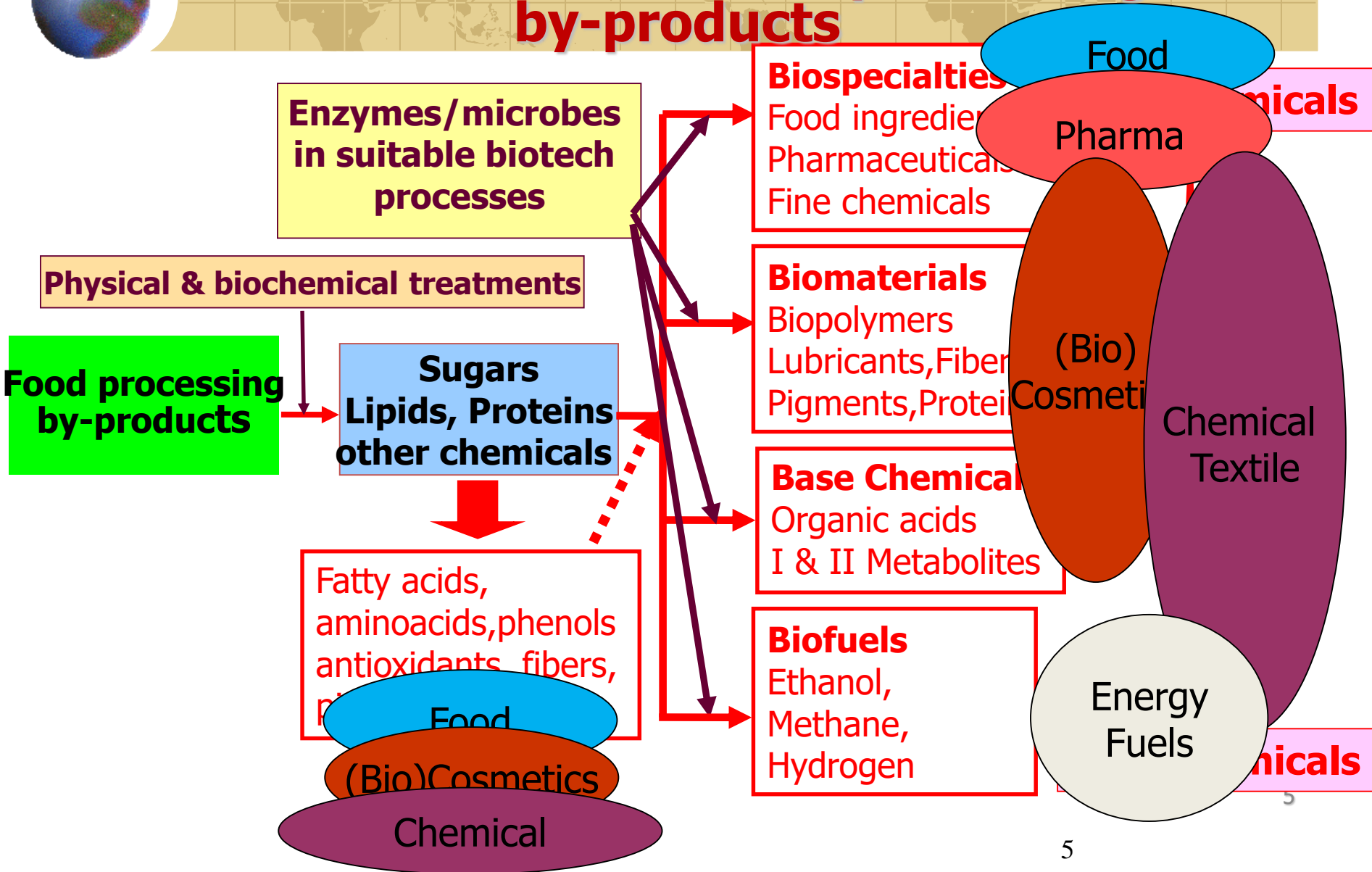
- Forestry residues and waste
- Agricultural and livestock waste
- Food by-products & waste
- Municipal waste



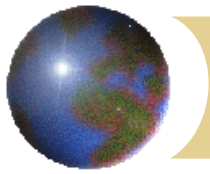
Water, Feeds, Fertilizers



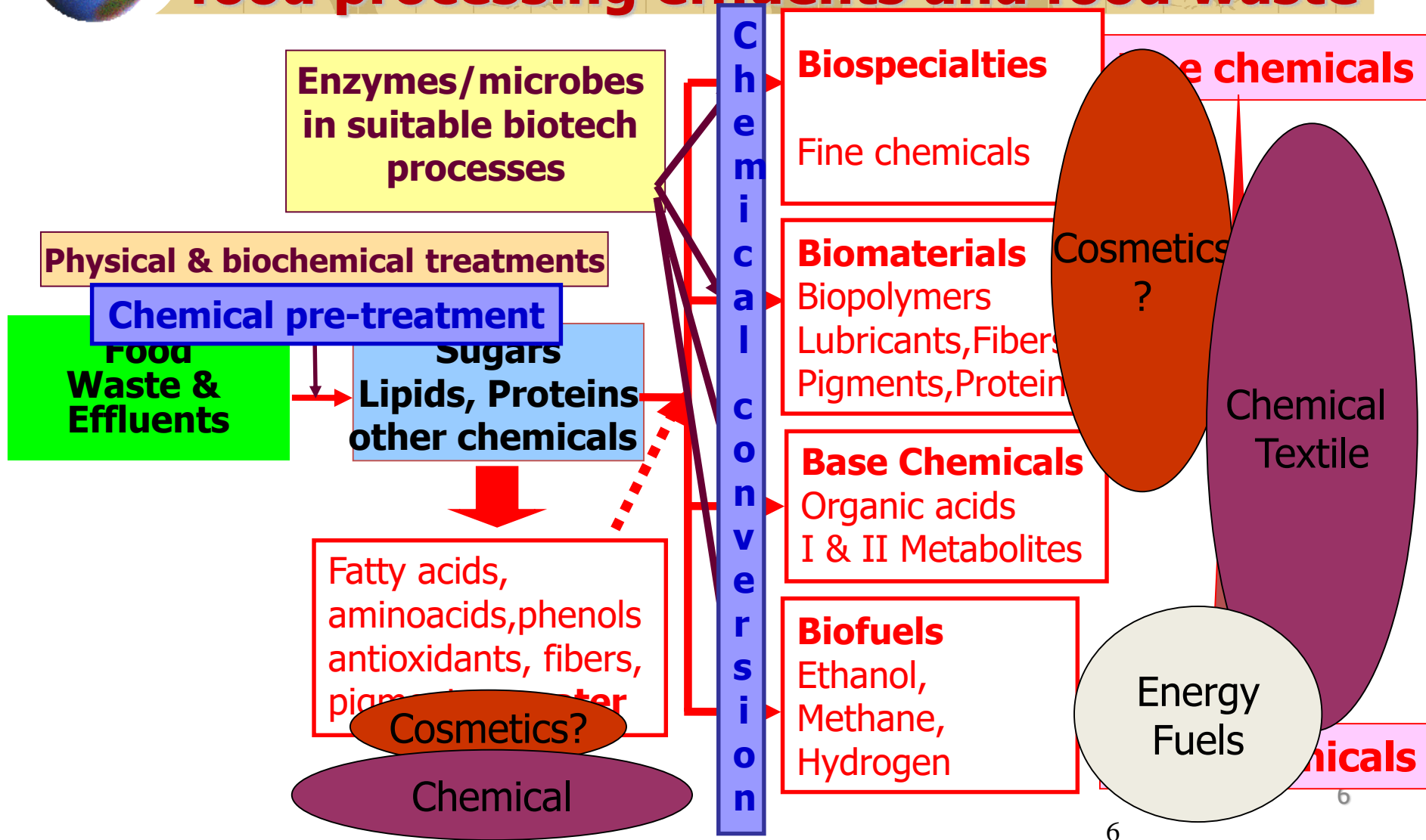
# Biorefineries from food peocessing by-products

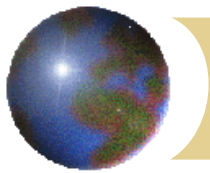


Scoma *et al* (2016) Critical Rev Biotechnology. 36:175-189  
 Fava *et al* (2015) New Biotechnology, 25:32

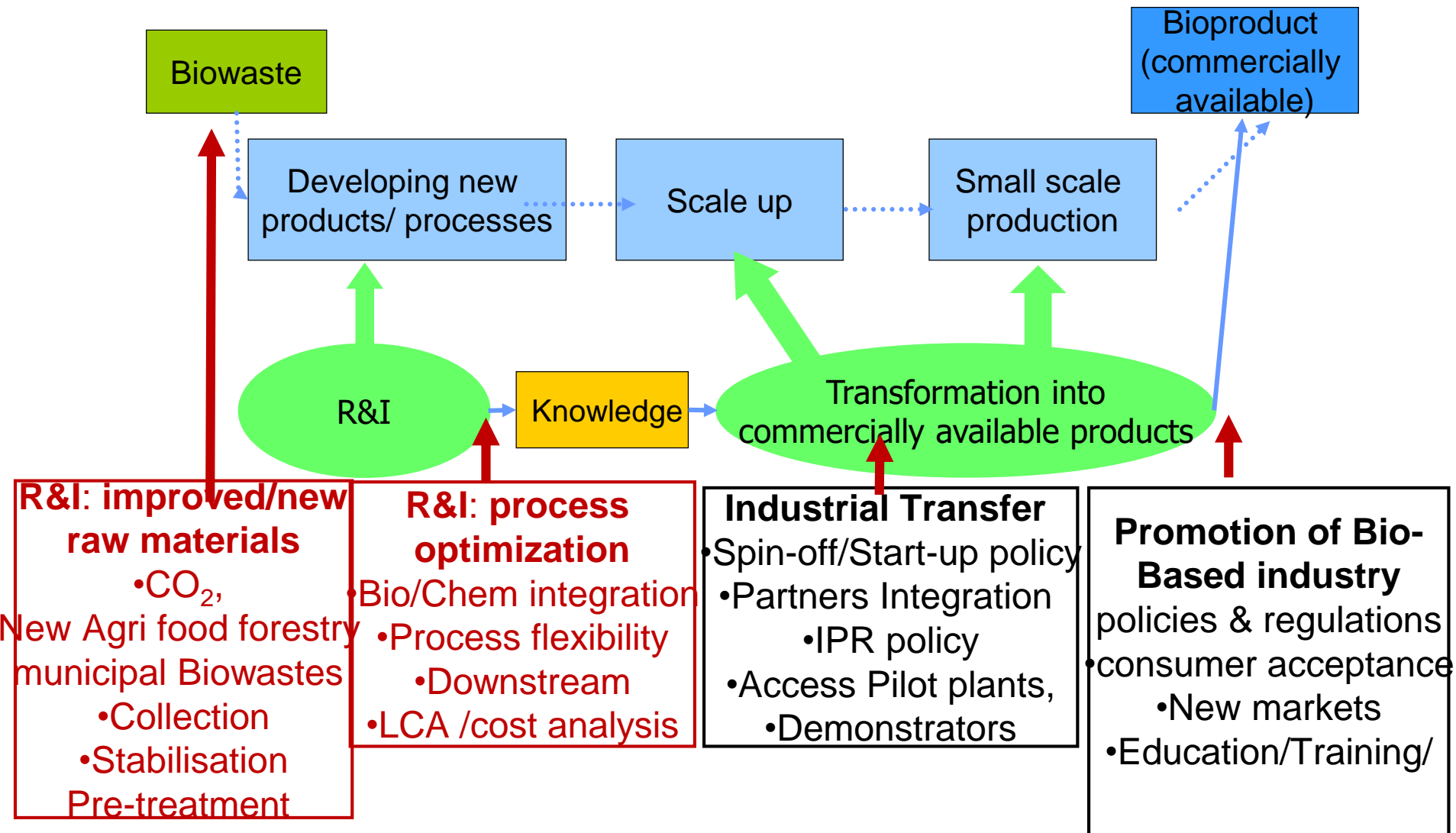


# Biorefineries from food processing effluents and food waste

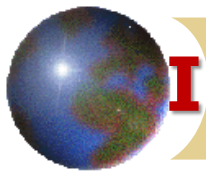




# Biowaste Biorefineries: main R&I needs and opportunities

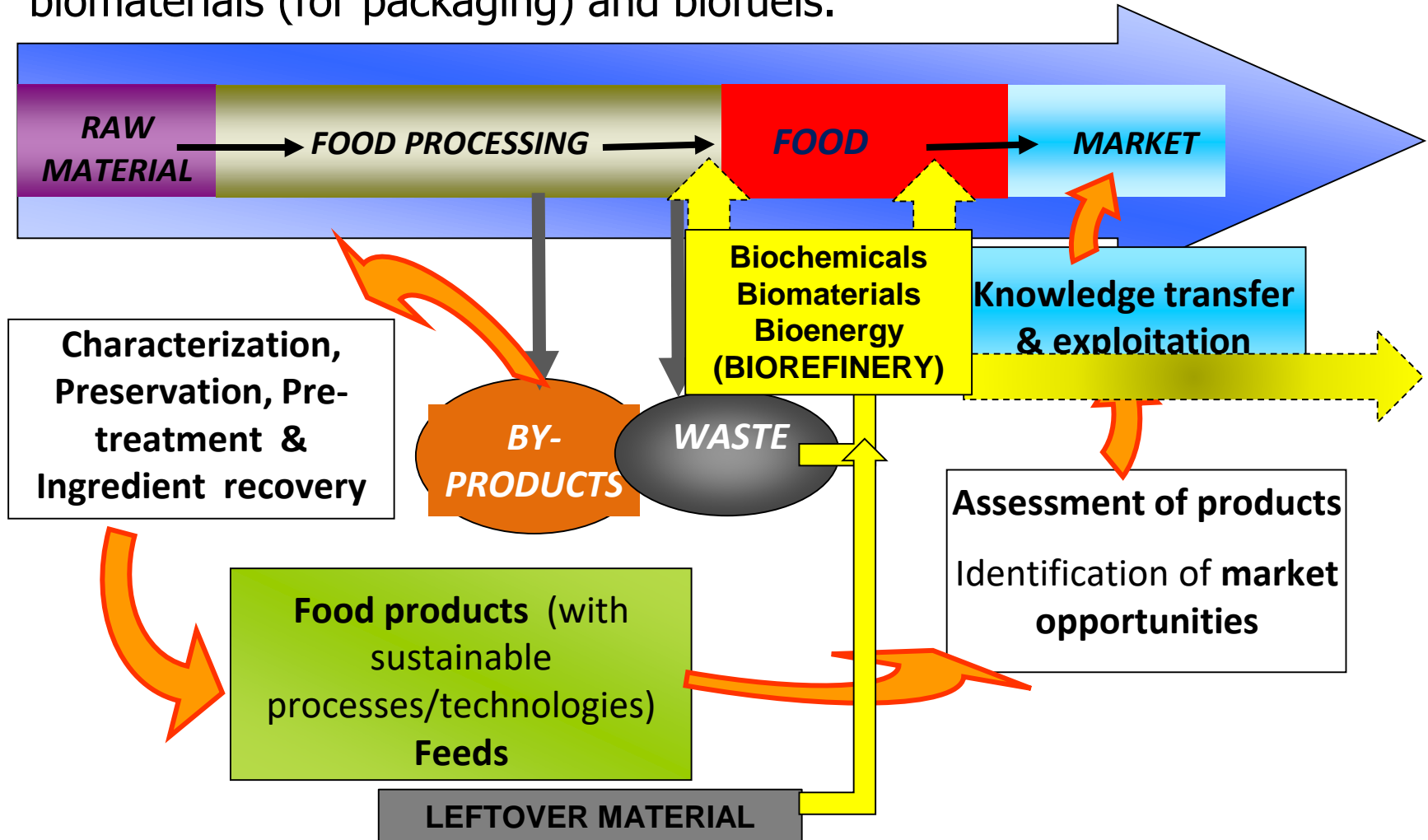




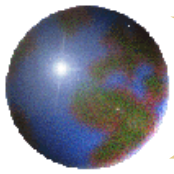


# Integrated biorefineries in the food industry

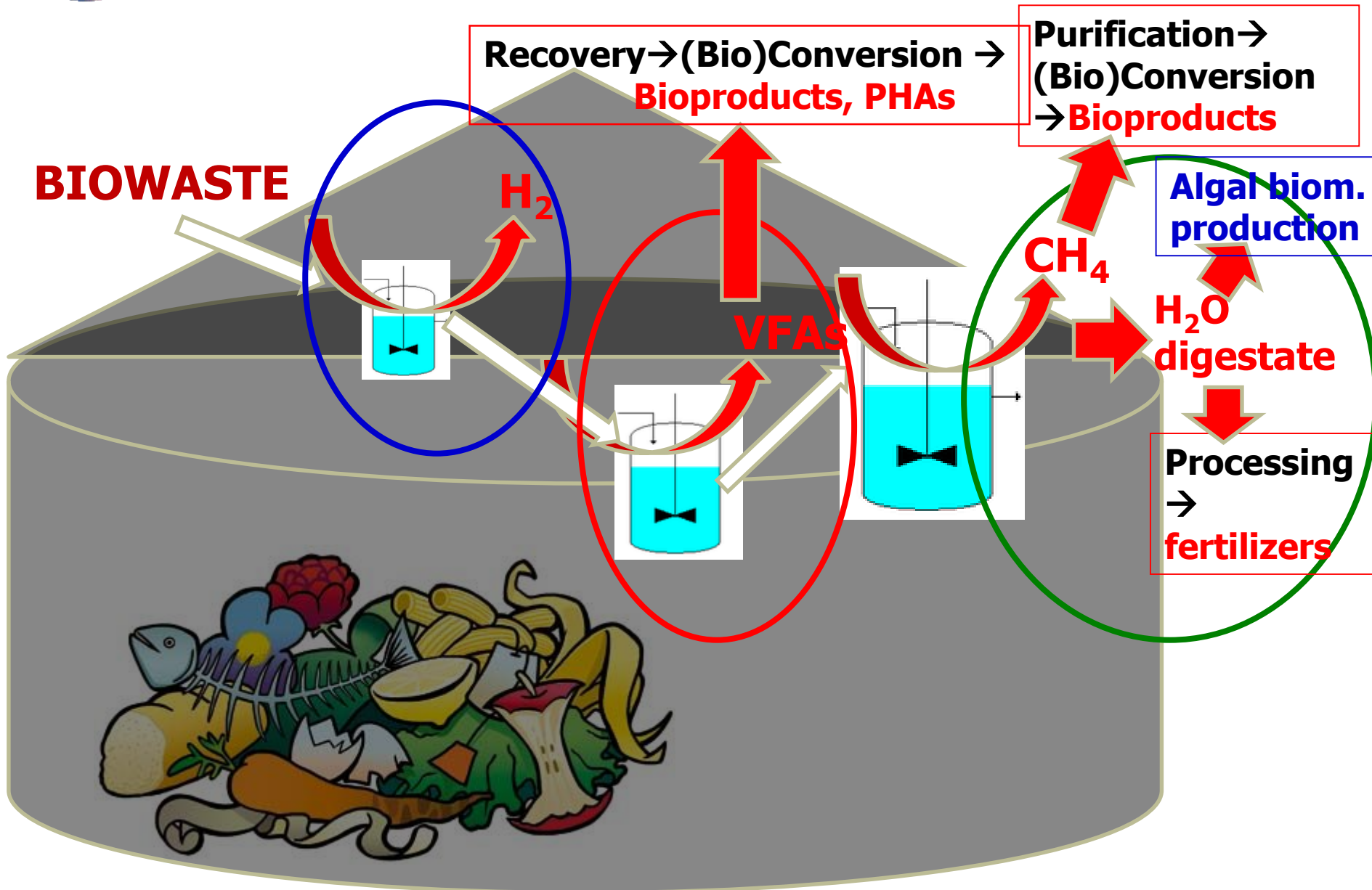
Integrated exploitation of food processing byproducts and waste with the production of food and feed ingredients and products, biochemicals, biomaterials (for packaging) and biofuels.

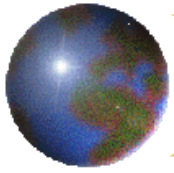




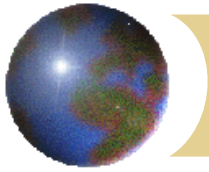


# Anaerobic digester biorefinery

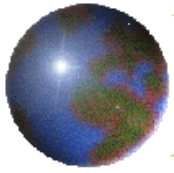




# **Bio-polymers from organic waste/wastewater**



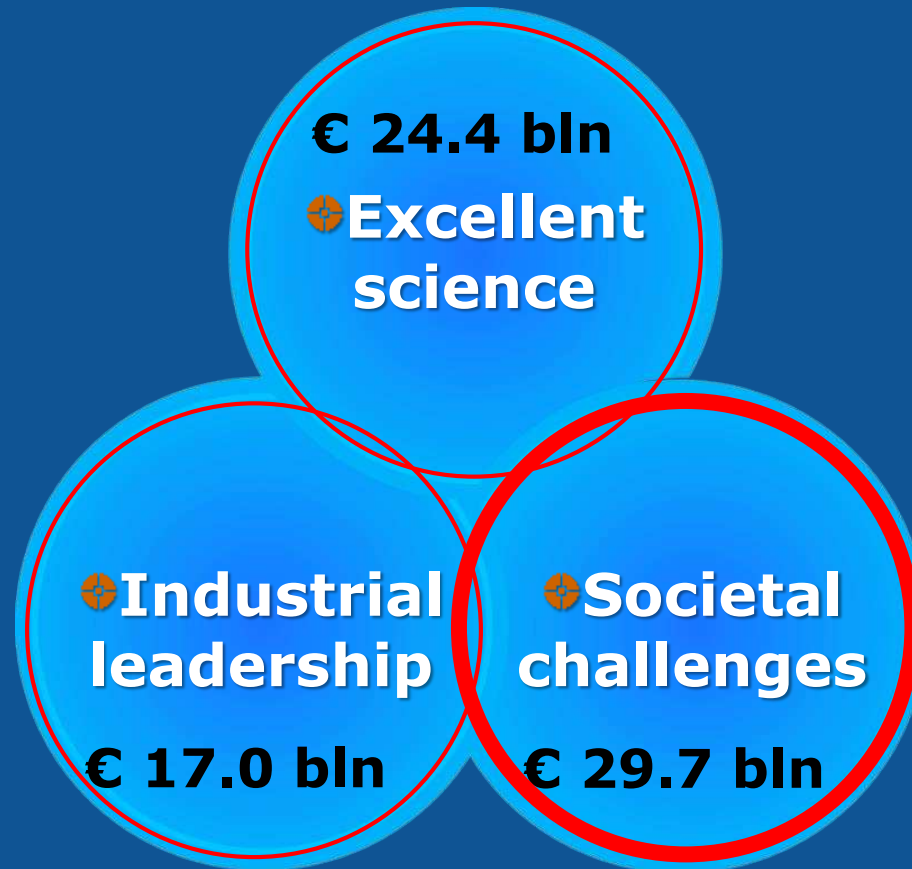
# **Biorefinery associated to wastewater treatment**

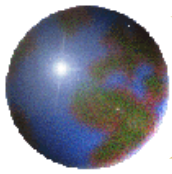


# **Bio-polymers from organic waste/wastewater**

# *Horizon 2020: three priorities*

**Horizon2020, the EU Commission research and innovation funding programme (~79 Billion, 2014-2020)**





# Biowaste exploitation in H2020

## Societal challenges



1. Health, demographic change and wellbeing (7.472 Bln)

2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy (3.851 Bln)

3. Secure, clean and efficient energy (5.931 Bln)

4. Smart, green and integrated transport (6.339 Bln)

5. Climate action, resource efficiency and raw materials (3.081 Bln)

6. Inclusive, innovative and reflective societies (1.310 Bln)

7. Secure societies (1.695 Bln)



## Relevant R&I topics in H2020 WP2018-2020

### From the SC2 WP:

- CE-SFS-25-2018: Integrated system innovation in valorising urban biowaste
- CE-RUR-08-2018-2019-2020: Closing nutrient cycles
- RUR-09-2018: Realising the potential of regional and local bio-based economies

### From the SC3 WP:

- LC-SC3-RES-16-2019: Development of solutions based on renewable sources that provide flexibility to the energy system
- LC-SC3-RES-21-2018: Development of next generation biofuels and alternative renewable fuel technologies for road transport
- LC-SC3-RES-23-2019: Development of next generation biofuel and alternative renewable fuel technologies for aviation and shipping

### From the SC5 WP:

- CE-SC5-03-2018: Demonstrating systemic urban development for circular and regenerative cities
- CE-SC5-04-2019: Building a water-smart economy and society



# *A Public-Private Partnership on Bio-Based Industries*

*Realising the European Bio-economy Potential*



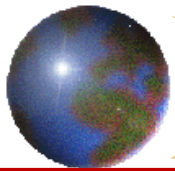
Supported by



<http://www.bbi-europe.eu/>

 Bio-based Industries  
Consortium





# The BBI JU: structure and priorities

Public partner  
27% of investment



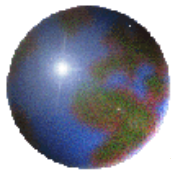
€3.7 billion



Private partner  
73% of investment

A structured approach via 5 **Value Chains** (VC)...

- ❖ VC 1: From ***lignocellulosic*** feedstock to advanced biofuels, bio-based chemicals & biomaterials
  - ❖ VC 2: Next generation ***forest***-based value chains
  - ❖ VC 3: Next generation ***agro***-based value chains
  - ❖ VC 4: New value chains from (organic) ***waste***
  - ❖ VC 5: ***Integrated*** energy, pulp and chemicals biorefineries
- and a marine bioresource exploitation value chain is coming...



# Potential R&I priorities WP 2018

**CALL LAUNCH: APRIL/MAY 2018**

## **STRATEGIC ORIENTATION 1: FOSTER SUPPLY BIOMASS FEEDSTOCK TO FEED BOTH EXISTING CHAINS**

*Thank You!*

### **Improve the utilisation of existing feedstock sources**

Improve the logistic and pre-processing steps of locally sourced biomass to serve as feedstock for the bio-based industry

### **Expand the exploitation of under-utilised or new feedstock for the bio-based industries**

- Resolve logistical, infrastructural and technological challenges to valorise residual and side streams from aquaculture, fisheries and seafood processing industries
- Turn mixed waste streams of municipal origin into sustainable feedstock for the bio-based industry by overcoming hurdles of dilution, pollution and diversity of content
- Optimise and validate biotechnologies to convert CO<sub>2</sub> into valuable products