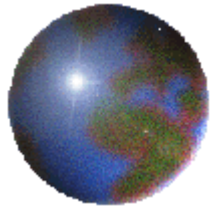


Agri-Food Waste Day Conference
Brussels, October 17, 2017



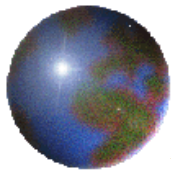
Agrifood waste exploitation: state-of-the-art and new opportunities, also in the frame of Horizon2020 and the PPP BBI

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

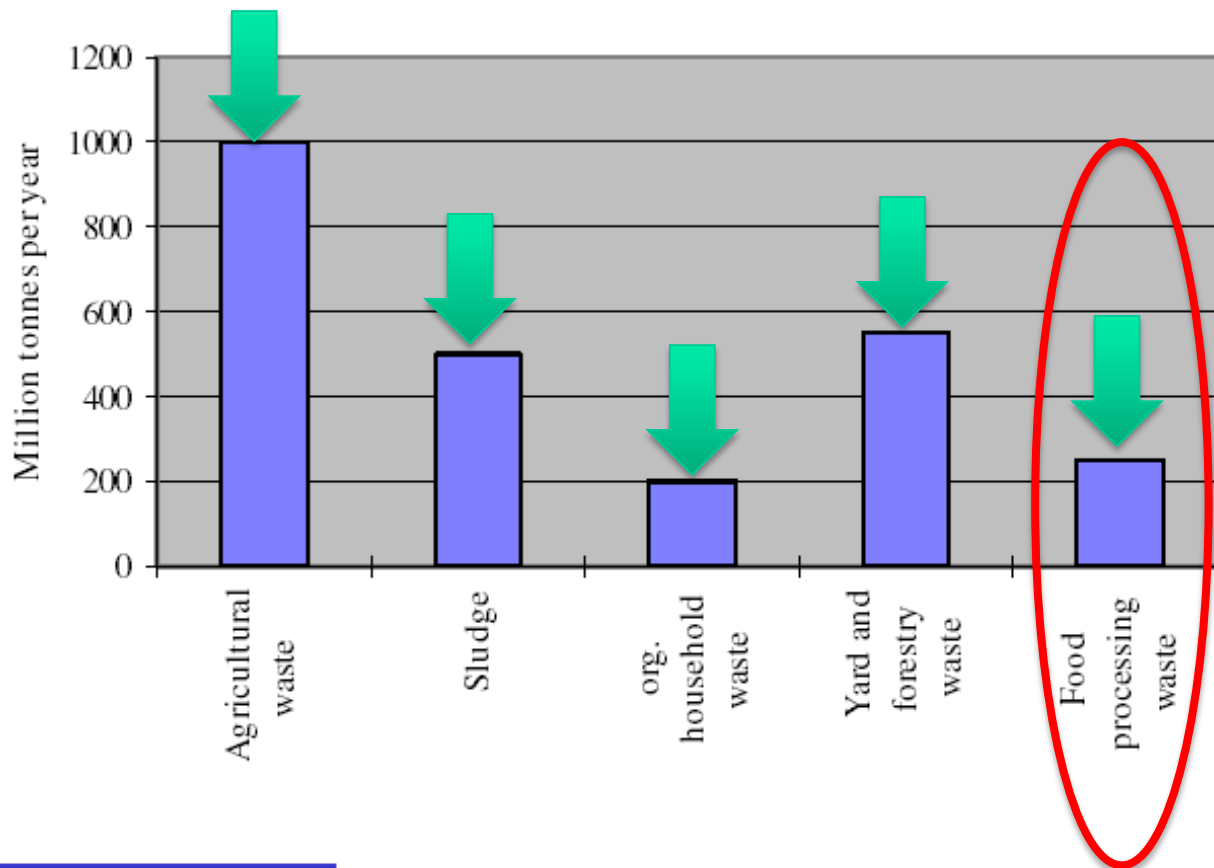
David Bolzonella

University of Verona, Italy

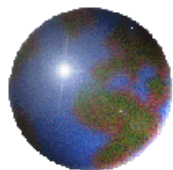


Biowaste in Europe

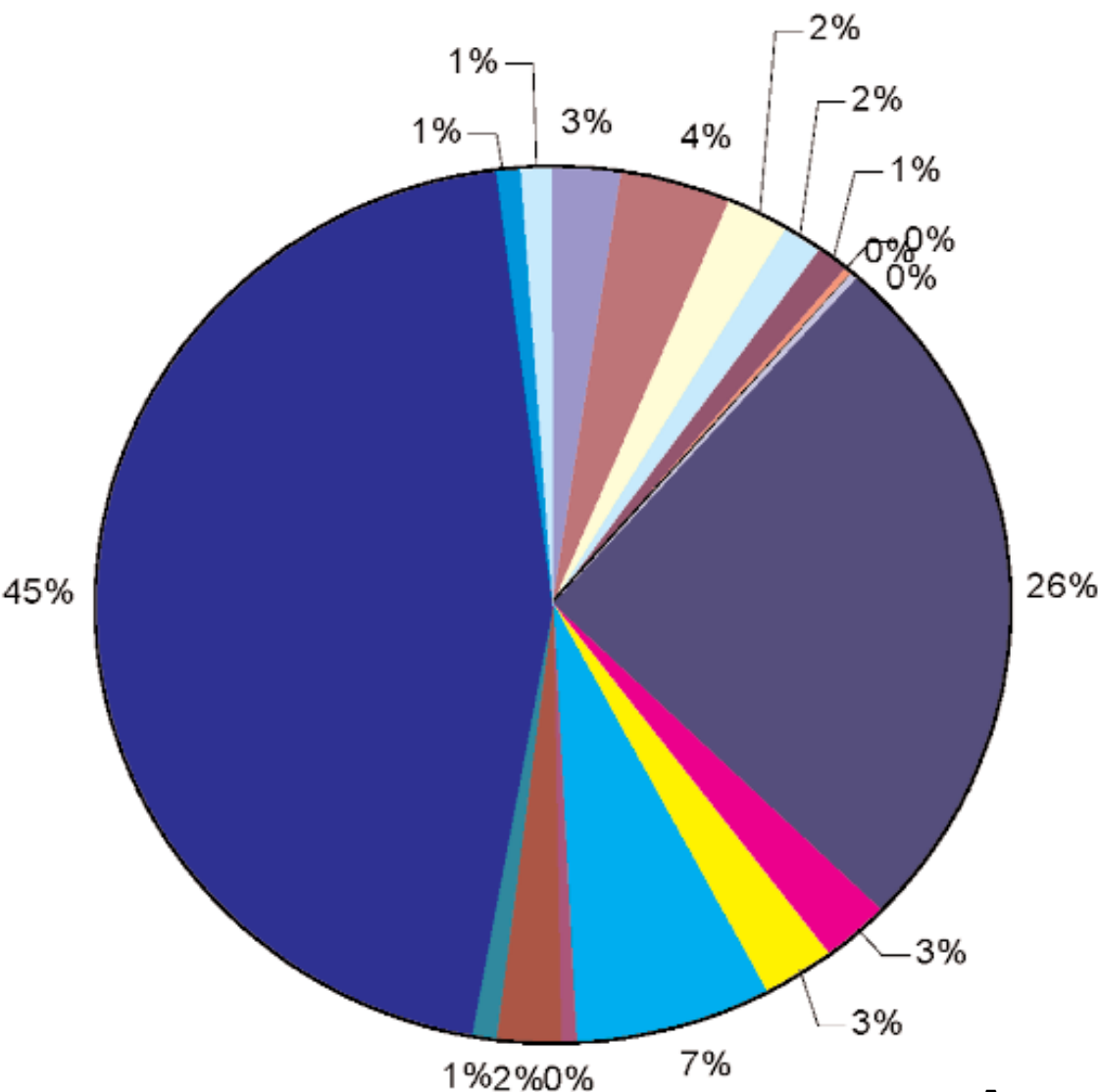
Annual organic waste streams in the EU



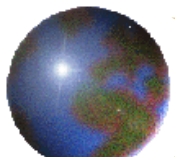
- Homogeneous streams suitable for processing;
- Streams rich of highly valuable compounds;
- They adversely affect the environmental sustainability of the food industry (the first industrial sector in EU with 1.000 bil €/y turnover).



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
- Corn Starch production
- Potato Starch production
- Wheat Starch production
- Sugar production
- White wine
- Red wine



Biowaste Biorefineries

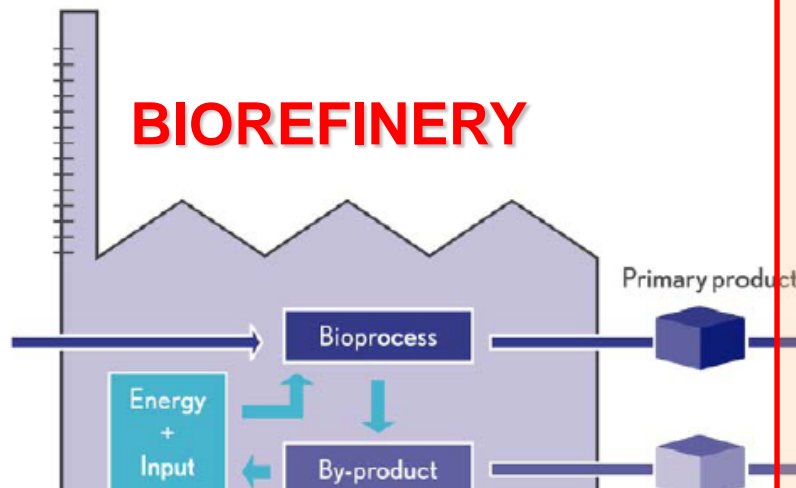
Towards a bio-based society: an integrated, multipurpose biorefinery

Forestry
residues and
waste

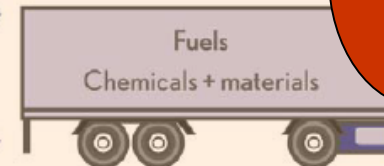
Agricultural and
livestock waste

Food by-
products &
waste

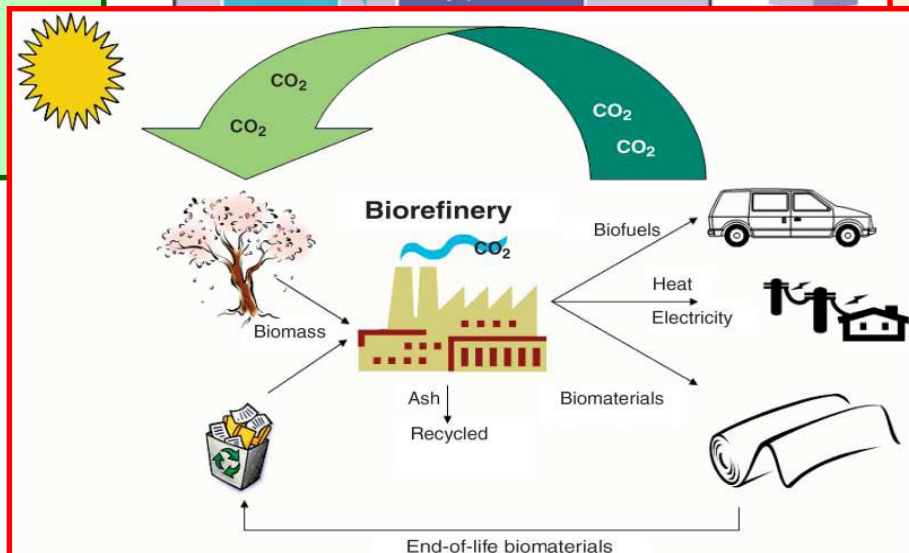
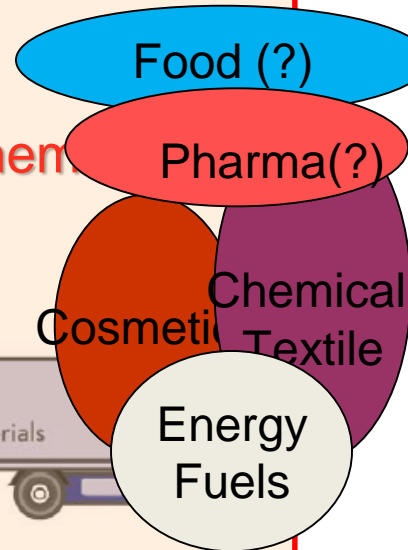
Municipal
waste

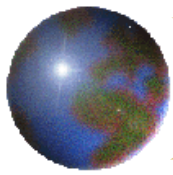


Biobased Chem
Biomaterials
Biofuels

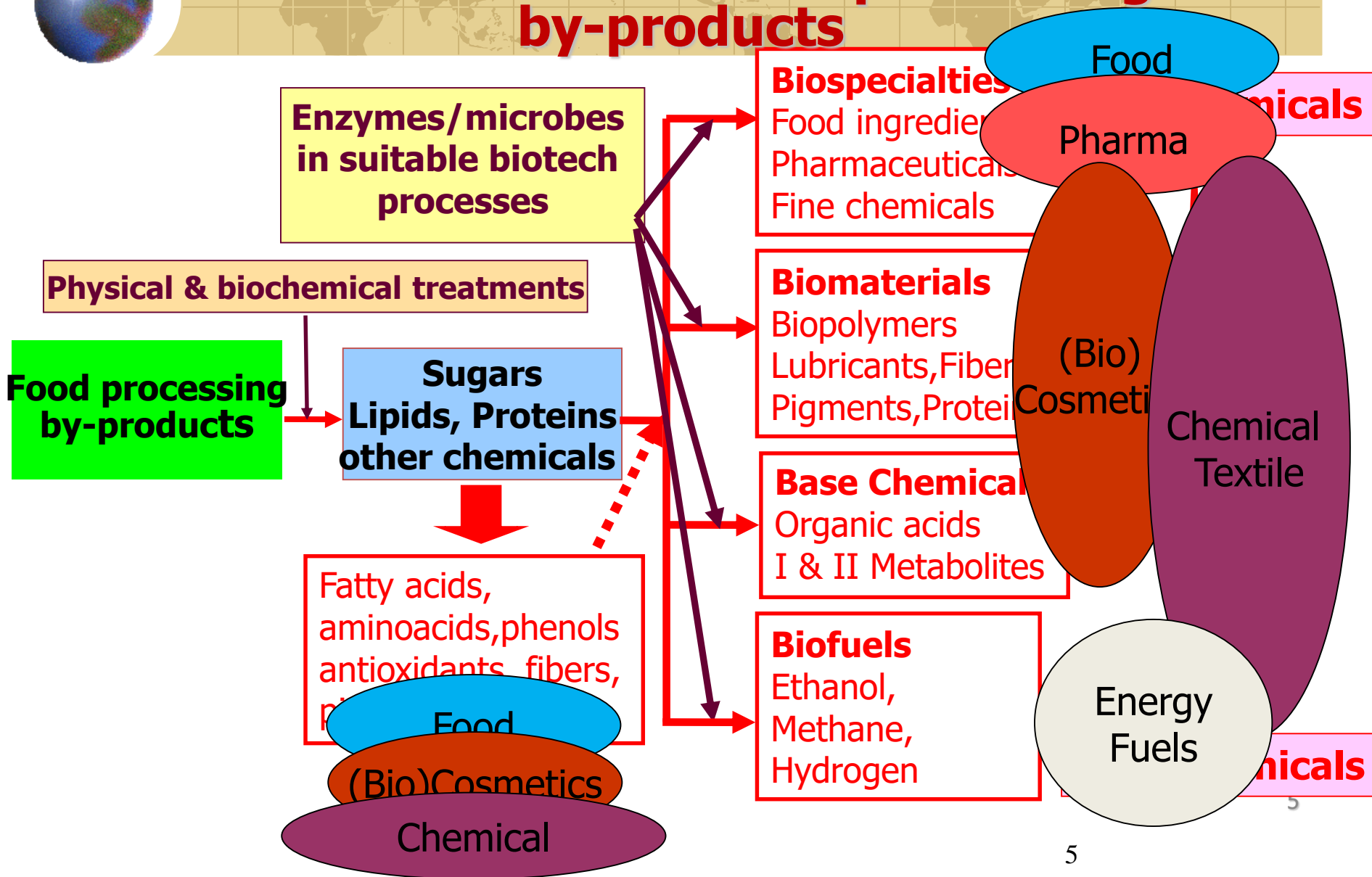


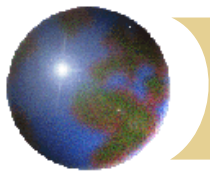
Water, Feeds, Fertilizers



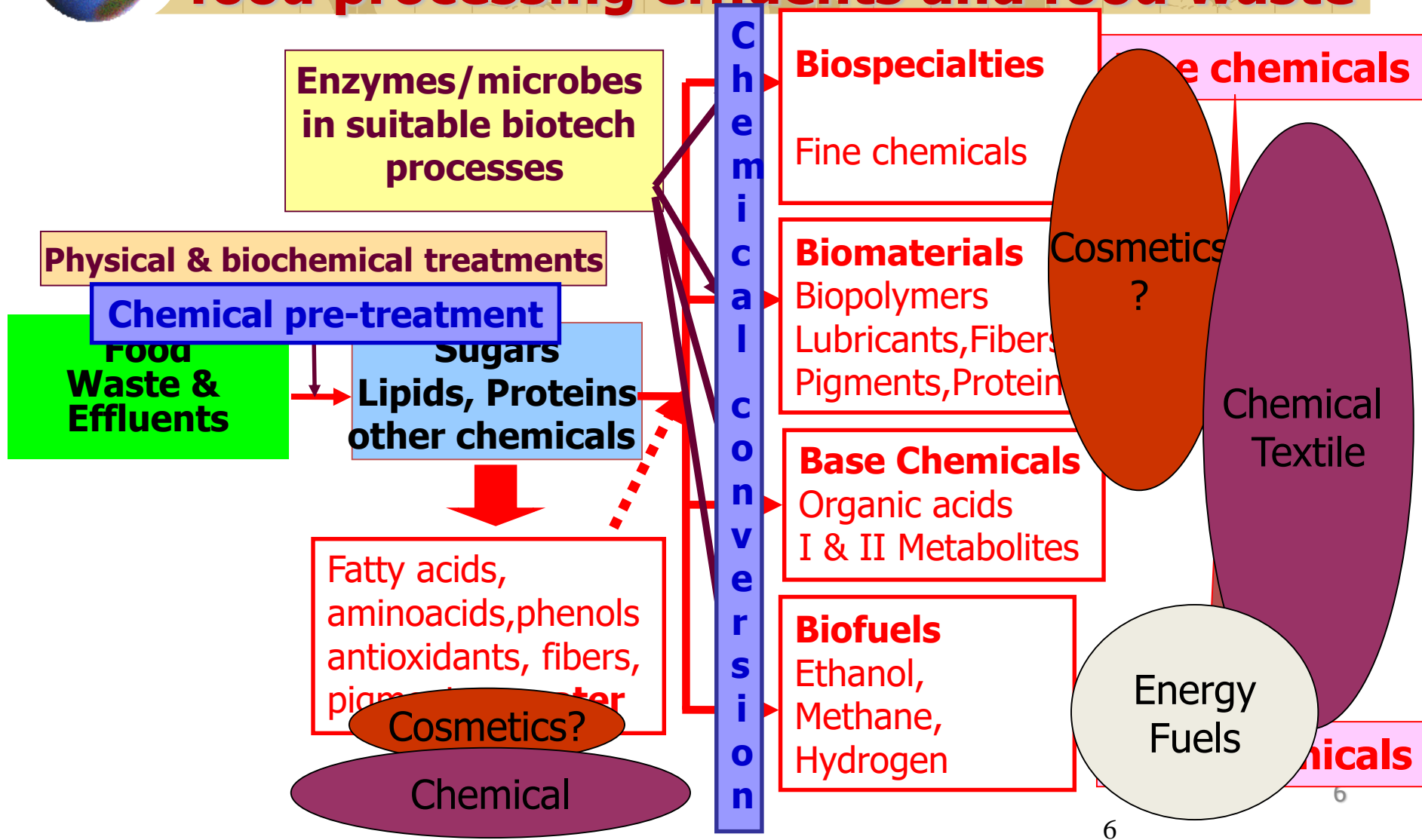


Biorefineries from food peocessing by-products



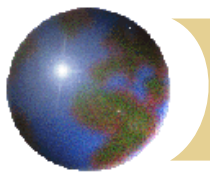


Biorefineries from food processing effluents and food waste

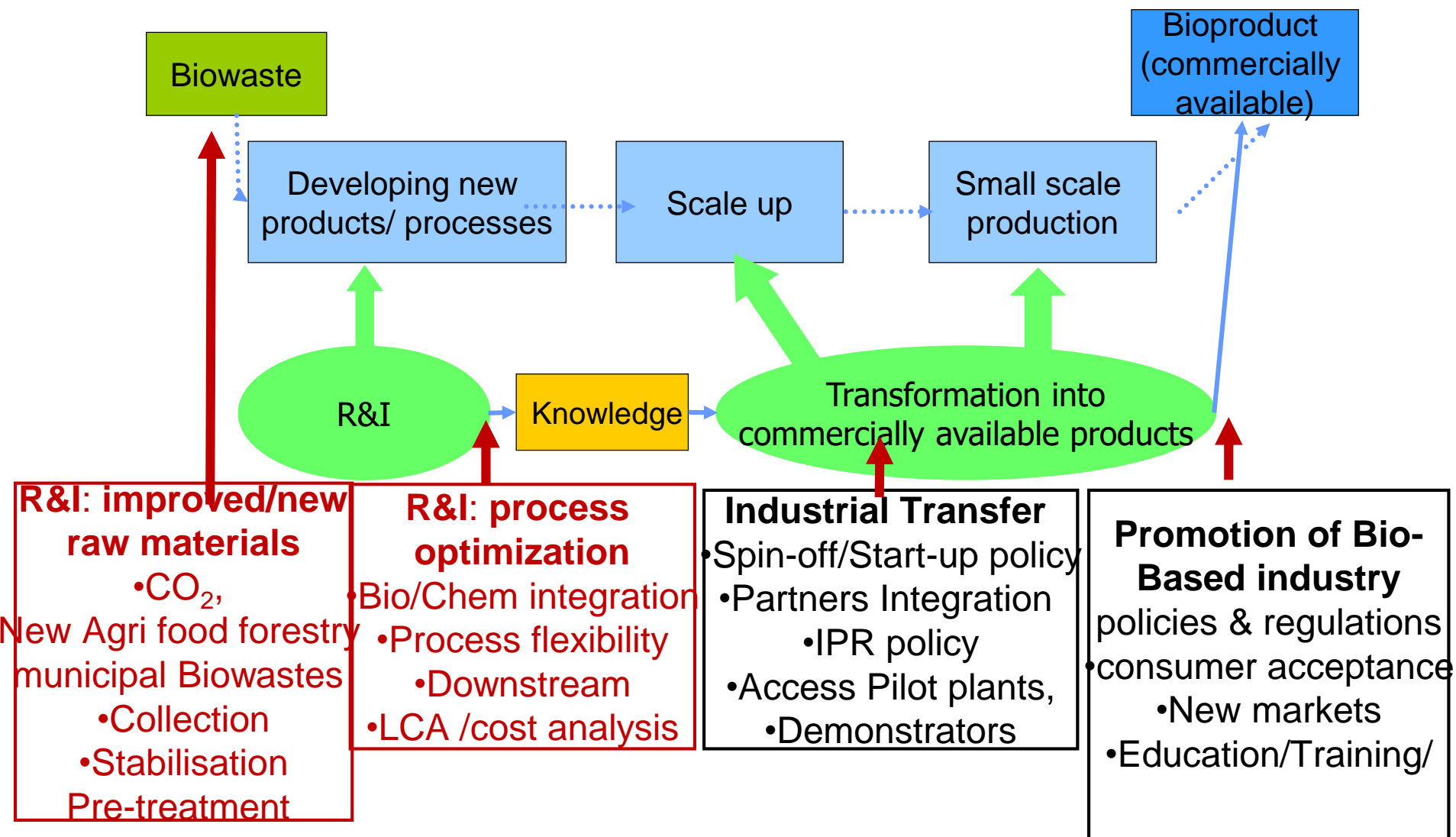


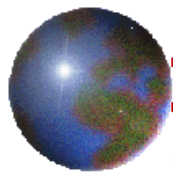
Scoma *et al* (2016) Critical Rev Biotechnology. 36:175-189

Fava *et al* (2015) New Biotechnology, 25:32



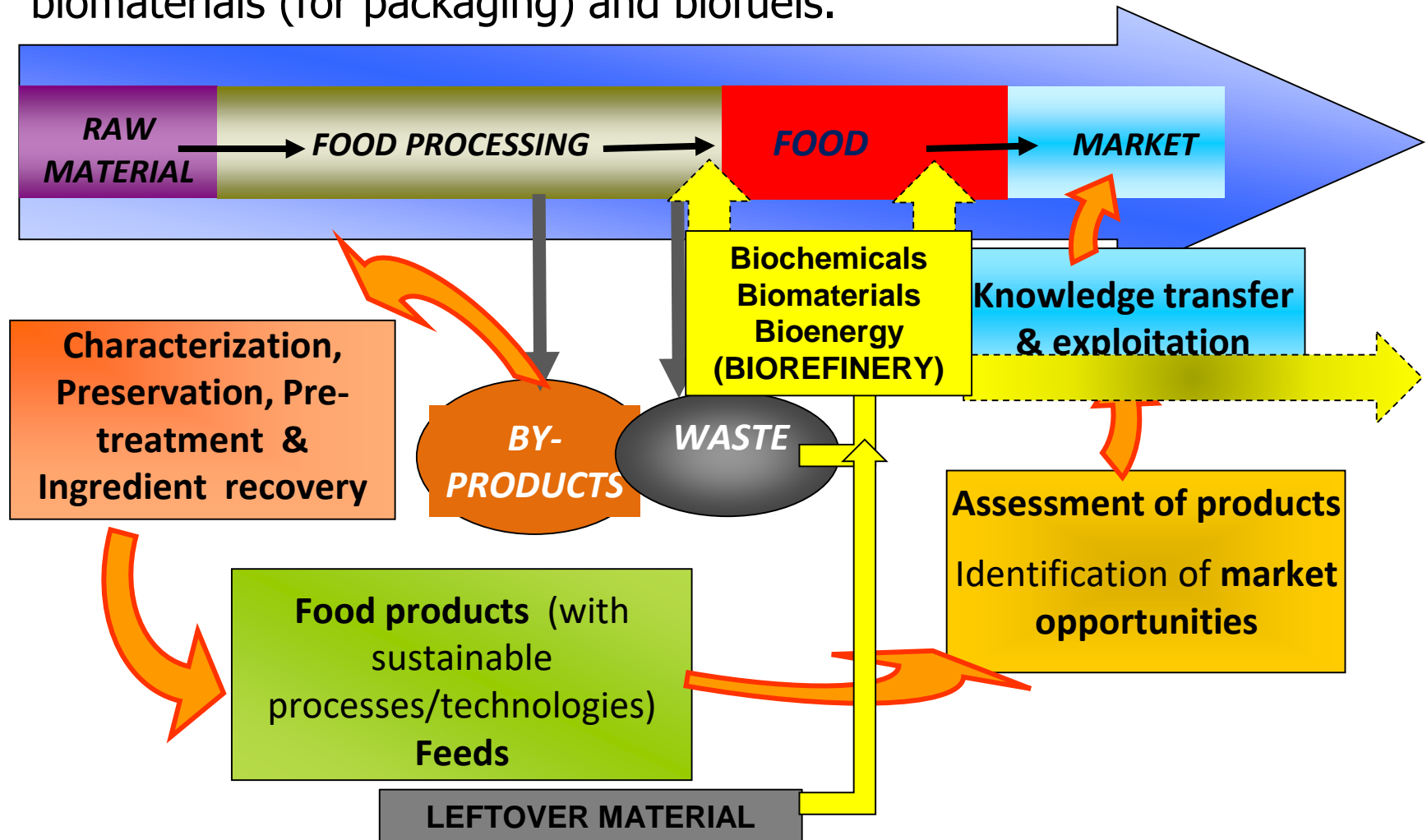
Biowaste Biorefineries: main R&I needs and opportunities

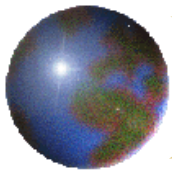




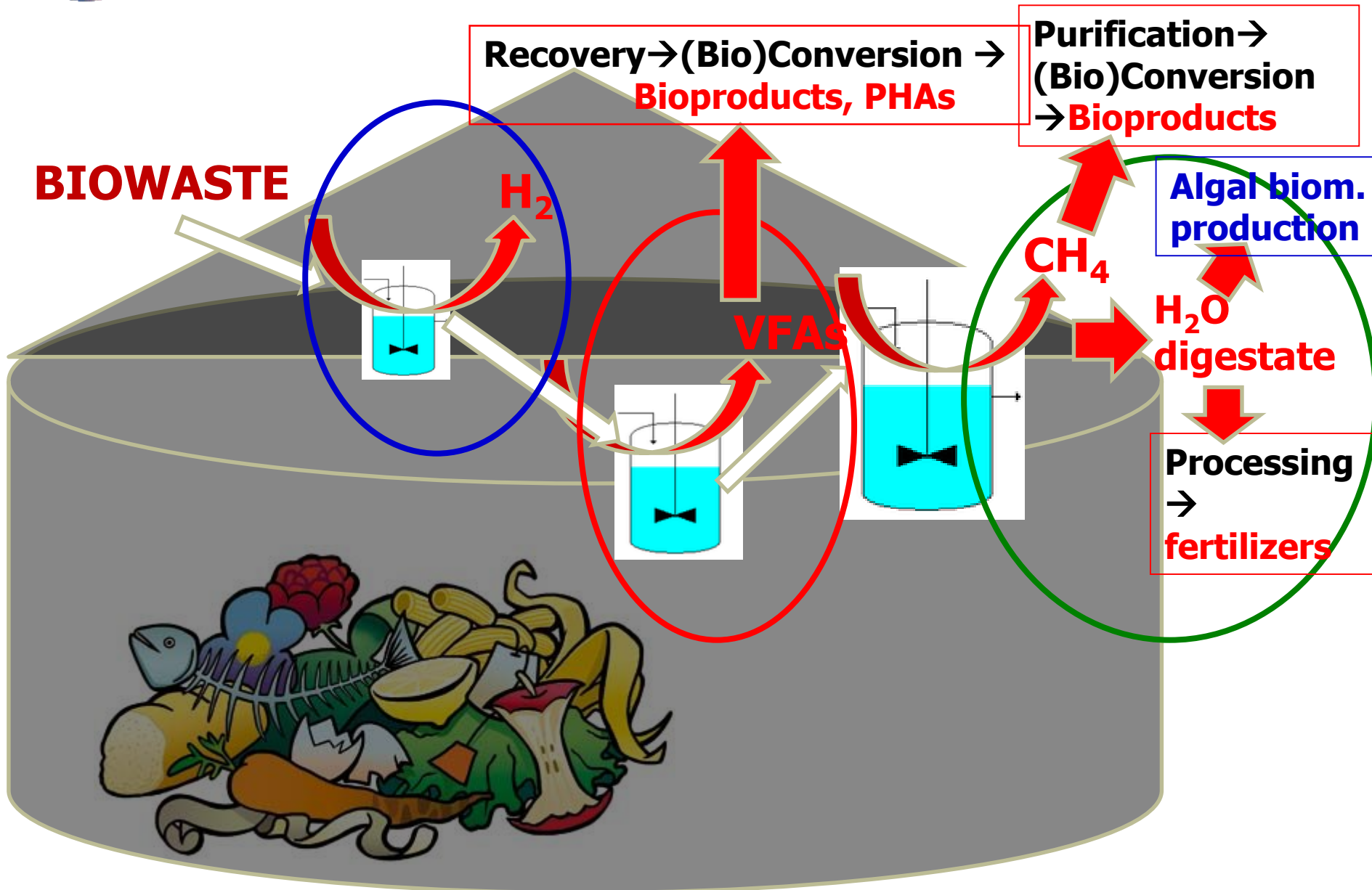
Integrated biorefineries in the food industry

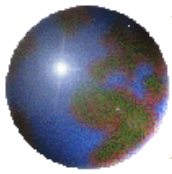
Integrated exploitation of food processing byproducts and waste with the production of food and feed ingredients and products, biochemicals, biomaterials (for packaging) and biofuels.





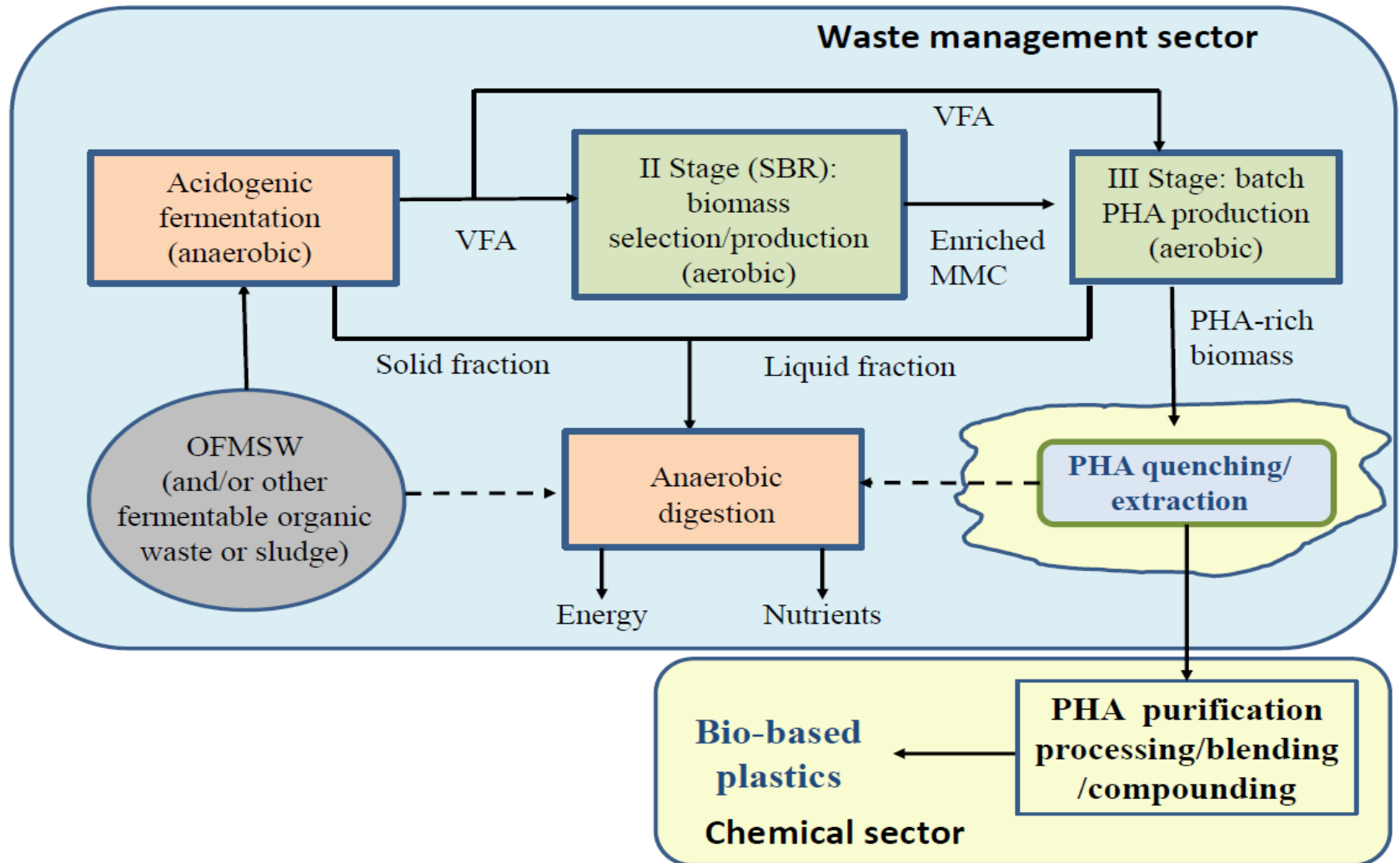
Anaerobic digester biorefinery

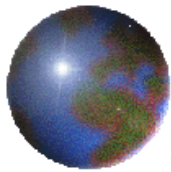




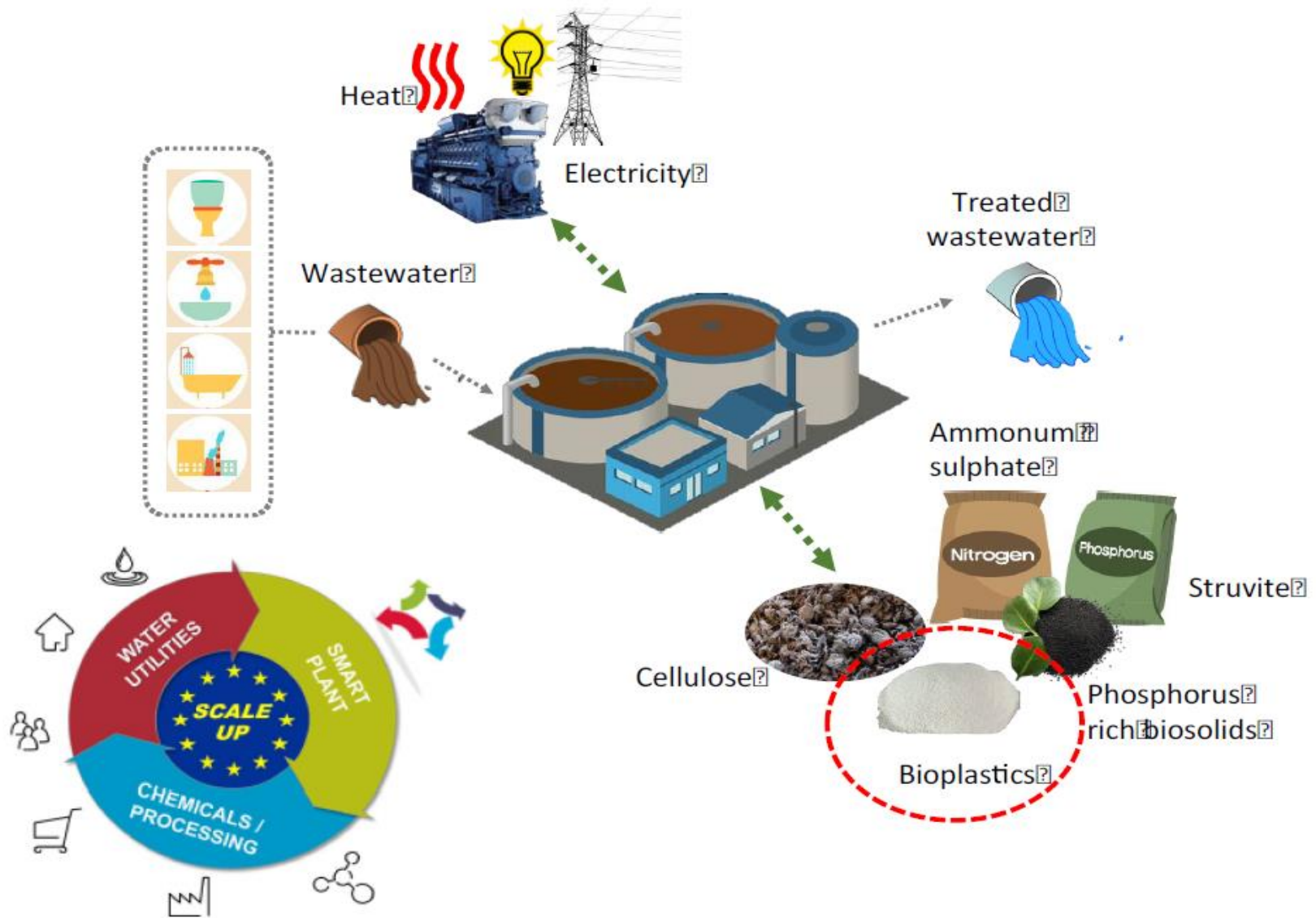
Bio-polymers from organic waste/wastewater

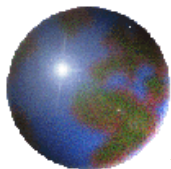
Typical process for PHA production from MMC and organic waste





Biorefinery associated to wastewater treatment





Bio-polymers from organic waste/wastewater



REsources from URban Blo-waSte (RES URBIS)

Call CIRC-05-2016: Unlocking the potential of urban organic waste (RIA)

GA 730349, 3 years, started January 1° 2017, 21 partners, 8 countries.

EU Grant: 2 996 688 €

Coordinator: Mauro Majone, Sapienza University of Rome, Italy



No Agro-Waste - Innovative approaches to turn agricultural waste into ecological and economic assets (NoAW)

Call: WASTE-7-2015 - Ensuring sustainable use of agricultural waste, co-products and by-products (RIA)

GA 688338, 4 years, started October 1° 2016, 32 partners, 15 countries

EU Grant: 6 887 570 €

Coordinator: Nathalie Gontard, INRA-Montpellier, France



Scale-up of low-carbon footprint material recovery techniques in existing wastewater treatment plants (SMART-Plant)

Call: WATER-1b-2015 - Demonstration/pilot activities (IA)

GA 690323, 4 years, started June 1° 2016, 29 partners, 10 countries

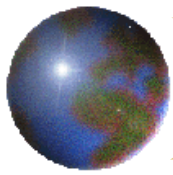
EU Grant: 7 536 300 €

Coordinator: Francesco Fatone, Technical University of Marche, Italy

Horizon 2020: three priorities

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





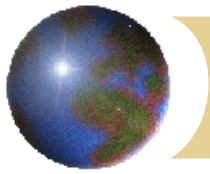
Biowaste exploitation in H2020

Societal challenges



**Tackling
societal
challenges
for a better
society**

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



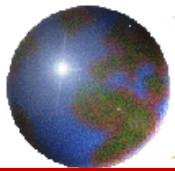
Supported by



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

 Bio-based Industries
Consortium





The BBI JU: structure and priorities

Public partner
27% of
investment



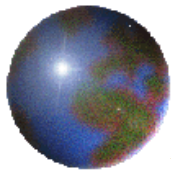
€3.7
billion



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 CO₂ into valuable products