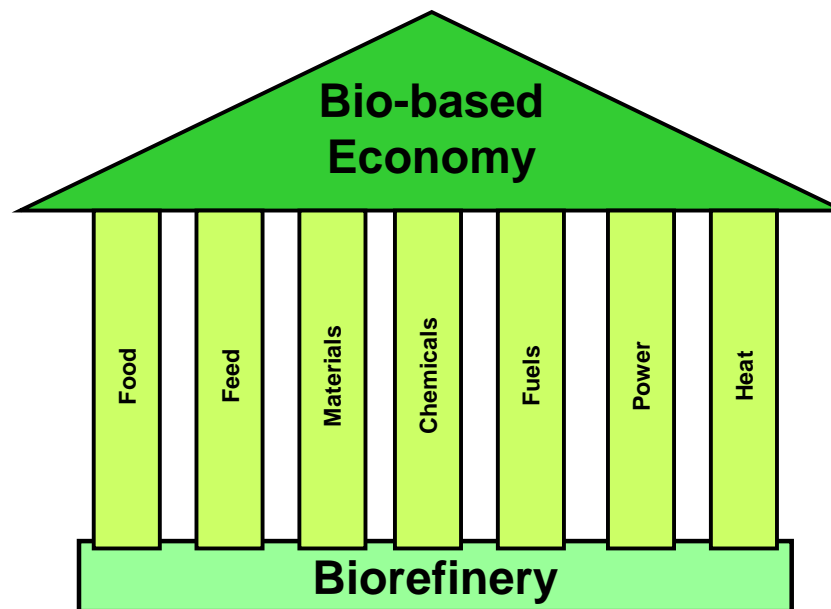


IEA BIOENERGY

TASK42 Biorefineries

IEA Bioenergy

Task42 co-ordinator René van Ree



Italian Stakeholder Meeting, Tortona, Italy, 4 April 2011

- 1. IEA Bioenergy**
- 2. Task 42 Biorefineries**
- 3. Biorefining – Definition**
- 4. Biorefining – Examples**
- 5. Biorefining – Classification system**
- 6. Country Reports**
- 7. Stakeholder Meetings**
- 8. BBPs and Bioenergy**
- 9. Current Status & Developments**
- 10. Points for Discussion**

1. IEA Bioenergy

IEA Bioenergy is one of a number of Implementing Agreements (IAs) established more than 30 years ago by the International Energy Agency (IEA)

Annual budget (2010): over 2 M US\$

Aim is to provide platforms for international collaboration and information exchange in bioenergy research, development, and demonstration

23 contracting parties (member countries)

AUS, AT, BEL, BRA, CAN, CRO, DEN, EC, FIN, FRA, GER, IRE, IT, JP, NL, NZ, NOR, SA, SWE, SUI, TUR, UK, USA

12 Tasks

Raw material related Tasks

Biomass Feedstocks for Energy Markets (43)

Energy Recovery Solid Waste Management (36)

Conversion process related Tasks

Combustion and Cofiring (32)

Thermal Gasification (33)

Pyrolysis (34)

Biogas & Landfill Gas (37)

Liquid Biofuels (39)

Assessment based Tasks

Socio-economic drivers (29)

AMF-cooperation (41)

Sustainable International Biomass Trade (40)

Greenhouse Gas Balances (38)

Task 42 Biorefinery

dealing with both raw materials, conversion processes and products in a Full Value Chain approach

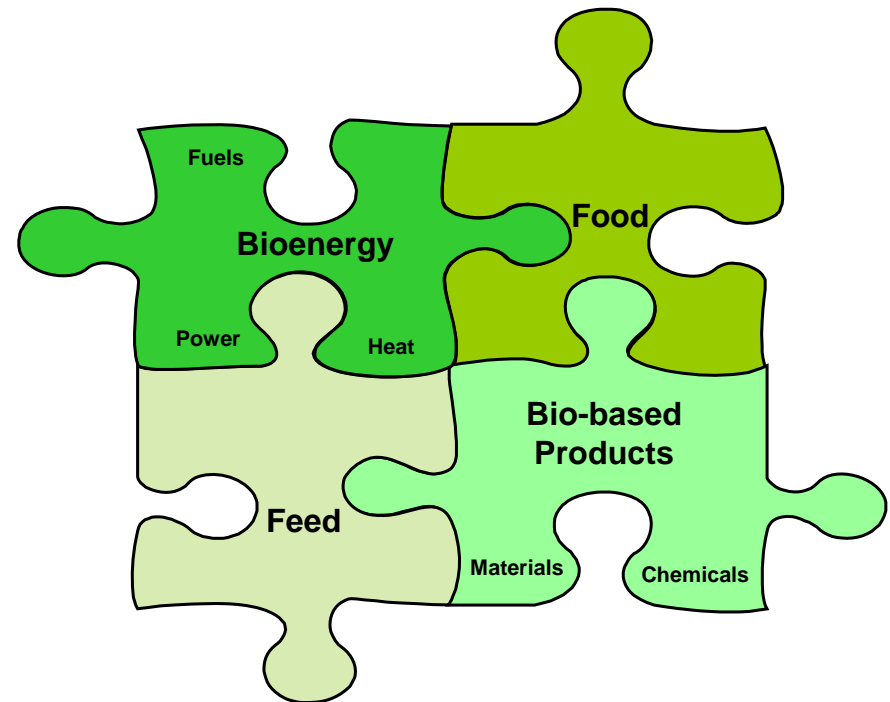
2. Task42 Biorefineries

Framework

Sustainable conversion of biomass into both Biobased Products and Bioenergy

Aims

- 1) Assess the worldwide position and potential for biorefineries
- 2) Gather new insights for the simultaneous production of food, feed, chemicals, materials, fuels, power and/or heat from biomass in a socially and environmentally acceptable and economically profitable way



13 Partners (2010)

Founding (2007) members (8):

Austria, Canada, Denmark, EC*, France,
Germany, Ireland, **the Netherlands**

New Members:

2009: Australia, Italy

2010: USA, United Kingdom, Turkey
(to be decided: Belgium)

* EC participation 2007 - 2010

Results 2007 - 2009

- Common definition for biorefineries
- Common classification system for biorefineries
- Country reports on current processing potential and mapping of existing biorefinery plants
- Bi-annual biorefinery seminar for stakeholders
- Linking of ongoing international activities through joint events and new initiatives

Activities 2010 - 2012

1. Finalisation Biorefinery Classification System
2. Identification most promising BBPs to be co-produced with Bioenergy
3. Assessing the current status and development potential of Energy-driven Biorefineries based on a Full Value Chain approach
4. Preparation of a Guidance document on Sustainability Assessment for BRs
5. Preparing a Summarising BR Paper
6. Bio-annual Task Meetings (internal know. diss.)
7. Workshops/website (external know. diss.)
8. Training Courses, Biorefinery Summer School

3. Biorefining – Definition

Biorefining is the Sustainable Processing of Biomass into a Spectrum of Marketable Bio-based Products & Bioenergy

Sustainable: maximising €s, minimising environmental impact, socially acceptable, ...

Processing: integrated mechanical, (thermo)chemical, biological, ... conversion

Biomass: land/marine crops, primary/secondary residues

Spectrum: more than one

Marketable: current/future markets (volumes, prices)

Bio-based Products: human food, animal feed, chemicals, materials

Bioenergy: fuels, power, heat, CHP

3. Biorefining – Definition

In general Product-driven and Energy-driven **Biorefineries** can be distinguished

Product-driven Biorefineries

Main goal is the production of one/more Bio-based Products (food, feed, chemicals, materials)

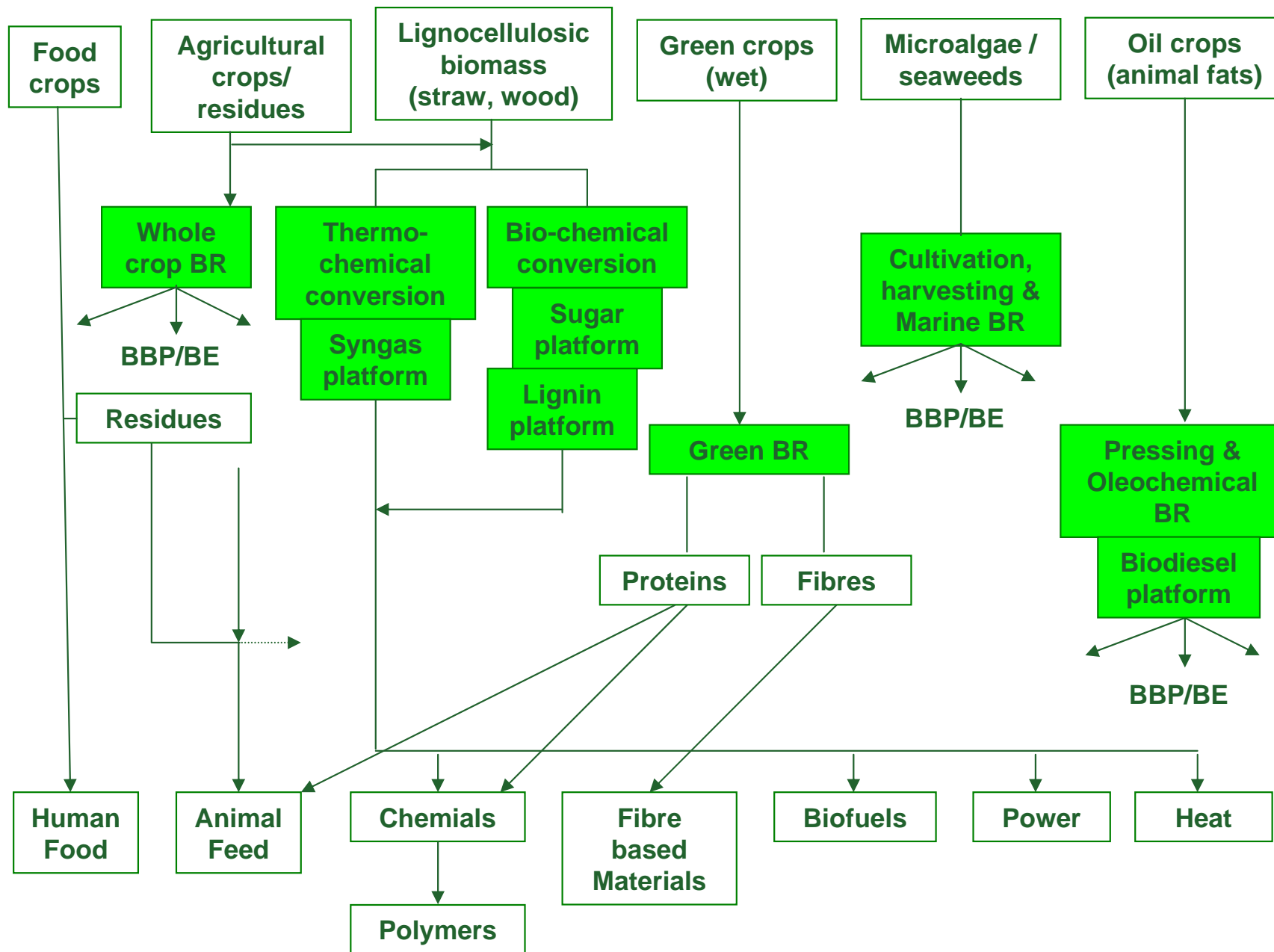
Process residues are used to produce Bioenergy for internal/external use to maximise the economic profitability of the overall biomass value chain

Energy-driven Biorefineries

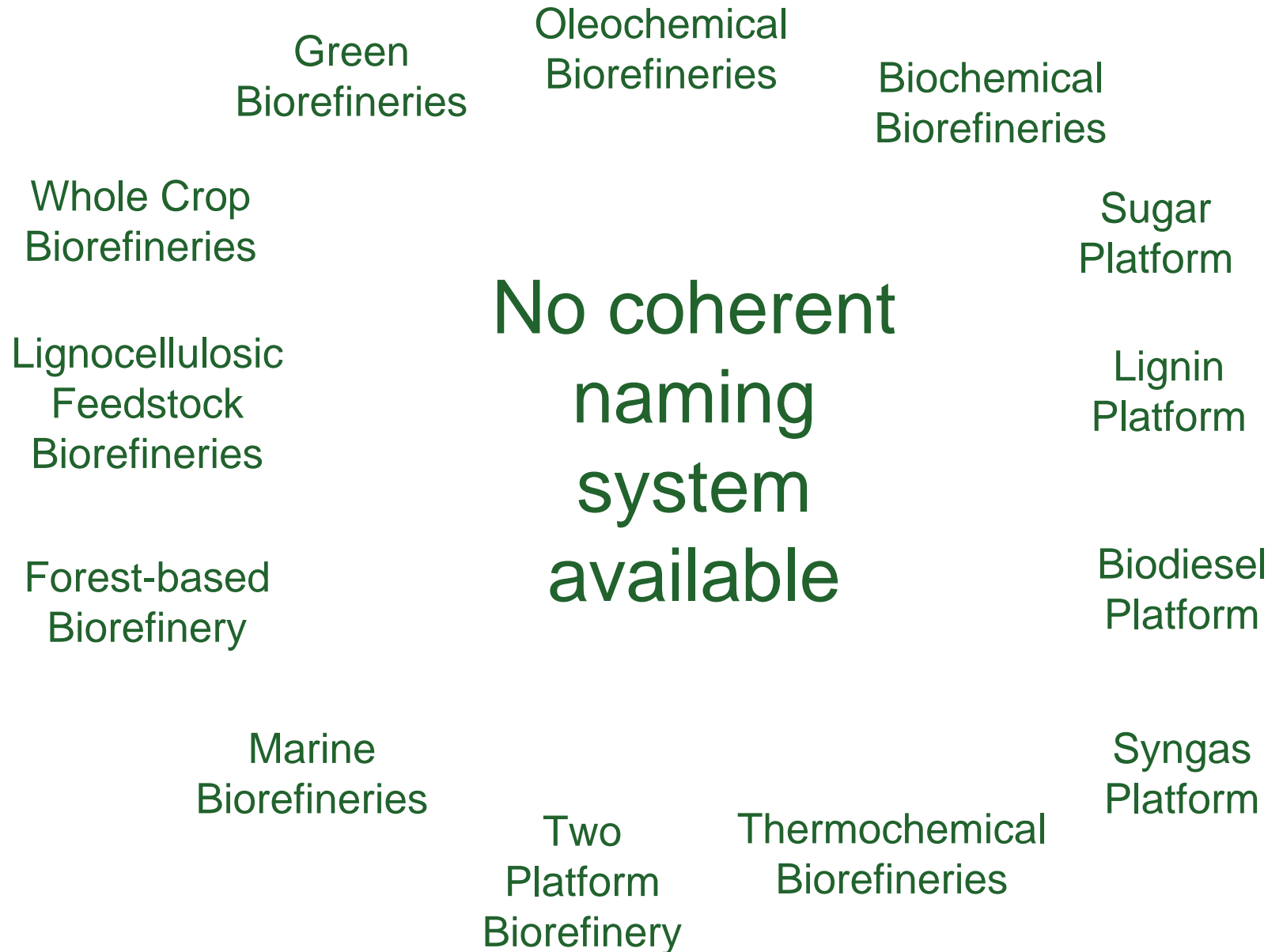
Main goal is the production of one/more Energy Carriers (fuels, power and/or heat)

Process residues are valorised to BBPs to maximise the economic profitability of the overall biomass value chain

4. Biorefining Examples



5. Classification System



2007 – 2009 Integrated Countries Report on Biorefineries (AT, CAN, DEN, EC, F, D, IRE, NL)

2010 – 2012 12 Separate Country Reports

- Mid-2011 on website
- End-2012 update on website

Content

Introduction

Energy production and consumption

Biomass use for non-energy purposes

Biomass, bioenergy and biorefinery policy issues & funding programmes

Running commercial biorefining facilities

Biorefining demo and pilot facilities

Major biorefining R&D activities

National stakeholders involved

Other issues/updates

References

2007 – Amsterdam (NL), Vienna (AT)

2008 – Copenhagen (DEN), Edmonton (CAN)

2009 – Dublin (IRE), Worms (D)

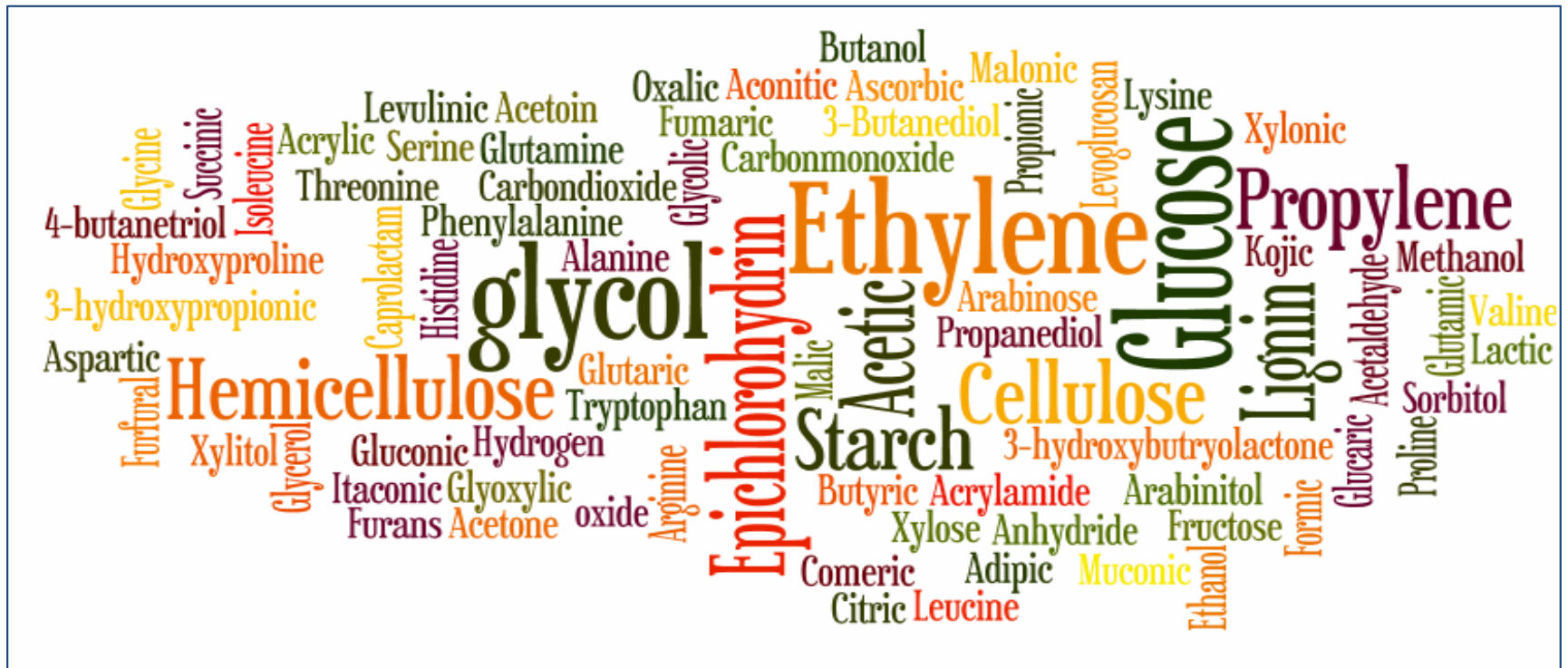
2010 – Lille (F), Chicago (US)

2011 – Tortona (ITA), Queensland (AUS)

2012 – Copenhagen (DEN), ???

8. BBPs + Bioenergy

Value Added from Biorefineries Biobased Chemicals and Polymers



Report prepared by



On behalf and with input of

Available @ website –
mid-2011



9. Current Status & Developments

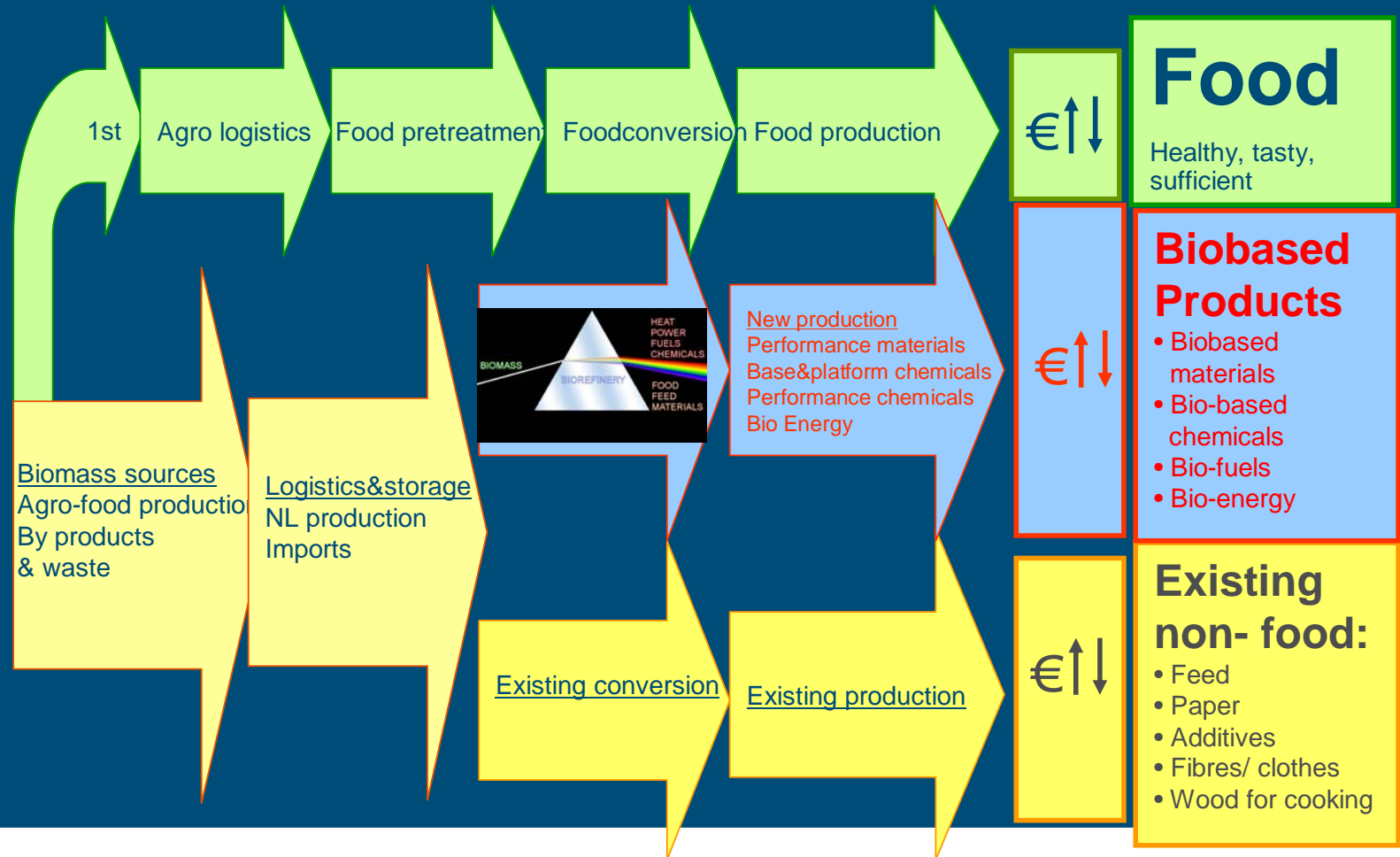
“Biorefining” is not new !!!

Specifically in the Food Industry
“biorefining” is already applied for ages

however

Sustainable processing of biomass
in both BBPs and BE
(= Biorefining DEF)
is new !

The New Biomass Value Chain by Biorefining



Short-term

Upgrading of existing industrial infrastructures to high-efficient biorefinery facilities by i) using process (chain) residues and/or ii) making process modifications for the production of added-value bio-based products and/or bioenergy

Examples: conventional ethanol + ddgs valorisation, biodiesel + cake and/or glycerol valorisation, upstream integration of biomass pyrolysis/gasification units within conventional oil refineries, ...

Long-term

Development of fully new sustainable biorefinery facilities for the high-efficient co-production of human food, animal feed, chemicals, materials, fuels, power and/or heat

Examples: Green BRs, Whole Crop BRs, Lignocellulosic Feedstock BRs, Marine BRs, ...

10. Points for Discussion

For a transition to a Biobased Economy biomass use should be economically profitable, environmentally friendly and socially acceptable

**Sustainable Biorefining
is the only right approach**

Product-driven BR is the final way to go

—

Bioenergy/Biofuels can pave the Road

Quality of use must be taken into account
(food > feed > chemicals/materials > fuels > power > heat)

**New international policy goals on the quality
(sustainability) of biomass use are required !!!**

Feed-in Tarrifs / Regulation -> Level-Playing-Field

Thank you for your attention

IEA Bioenergy

Task 42 Biorefineries

Further information
René van Ree
(rene.vanree@wur.nl)
www.fbr.wur.nl

**[www.IEA-Bioenergy.Task42-
Biorefineries.com](http://www.IEA-Bioenergy.Task42-Biorefineries.com)**

Italian Stakeholder Meeting, Tortona, Italy, 4 April 2011