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Kick-off Meeting of the CWG Integrated Biorefineries

Brussels, November 13 3013

Nationale Kontaktstelle Lebenswissenschaften (NKS-L)

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Today‘s agenda

- 10:00: Get-together with coffee
- 11:00: Welcome by the Coordinators
- 11:15: Tour de table
- 11:45: Vision for the CWG IB
- 12:45: Lunch
- 13:15: Roundtable: expectations of Members (short presentations)
- 14:45: General discussion
- 15:45: Coffee
- 16:00: Definitions, scope and alignment of a common work plan
- 17:00: Closure of the meeting

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Tour de table

CWG-IB Members

GWG - Integrated Biorefineries				
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Vision for the Collaborative Working Group „Integrated Biorefineries“

The Standing Committee on Agricultural Research

- reaches out beyond agriculture into the broader bioeconomy
  - Strategic and Collaborative Working Groups:
    - SWG Sustainable bio-resources for a growing bioeconomy
    - SWG Forest Research and Innovation
    - SWG Fisheries and Aquaculture
    - CWG Sustainable animal production
  - Coordination and networking:
    - Bioeconomy Panel
    - Bioeconomy Observatory
  - Foresight:
    - 4th SCAR Foresight Report looking at the bioeconomy
- is dedicated to contribute to the development of the European bioeconomy

Reasons for a CWG Integrated Biorefineries

- Since the KBBE-NET and the Lead Market Initiative on biobased products have come to an end the Member States and Associated Countries lack an **active platform for addressing the pressing coordination tasks** in the field of integrated biorefineries as cornerstone of the bioeconomy. The **highly dynamic developments** in integrated biorefineries worldwide demand transnational European actions. Otherwise, technological advantages may not be realised in socio-economic development and improved sustainability of European industries.
- A new action by the Member States and Associated Countries will cover the existing gap and take actions further: A Collaborative Working Group "Integrated Biorefineries" (working title) will **address the future needs and developments and will be complementary to the existing activities**

Aims of the CWG Integrated Biorefineries

Representatives from MS and AC work together

- to establish a common base for future collaboration
- to strengthen coherence and synergies
- to achieve a higher efficiency and effectiveness of the measures

- to move towards a European BioEconomy together!

Scope of the CWG Integrated Biorefineries

- supplement the activities of the SWG SBGB by extending far beyond primary production to technological development, research and innovation, and societal questions in the industrial context of biomass conversion and processing
- enable the MS and AC to coordinate their interests and complementary activities
- address the needs that have been recognised by Commission and Member States to work towards better coherence of their measures on European, national and regional levels

CWG Integrated Biorefineries will supplement the SWG Sustainable use of bio-resources for a growing bioeconomy

- **SWG SBGB** is focused on:
  - strategic questions concerning sustainability, biomass production and processing
  - involvement of stakeholders / communication
  - strategic focus regarding EU Bioeconomy Strategy and EU Bioeconomy Panel
  - bringing together different ideas of MS/AC for Bioeconomy as a broad concept
  - value creation by transsectoral flow of biomass – new value chains
  - definition of sustainability as process/dialogue between actors
  - reacting to the growing and changing bioeconomy landscape
- **CWG IB** will:
  - focus on research, development and innovation
  - supplement not only the SWG but the PPP BRIDGE by fostering research and development actions driven by MS/AC interests
  - complement the ERA-Nets by its wider approach involving the whole value chain

Overall objectives

- The CWG Integrated Biorefineries will focus on questions related to the **investment in research, innovation and skills**. The work between the relevant participants from the Member States and Associated Countries will **strengthen the coherence and synergies among the regional and national actors and the European Commission**. This shall lead to coordinated and coherent actions of the relevant players - especially funding bodies - and bring about higher efficiency and effectiveness of the measures. Ideally this would lead the **MS/AC to align their national programs, to develop European lighthouse projects** and to speak with one voice. With joint forces and a better critical mass the national funding will then be able play an important role which otherwise - without coordination - would perish in the global competition.

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BioEconomy Actions in Europe

SWG BIOMASS - MS/AC Strategies

ERA-EUPHRESCO
ERA-CAPS
ANIHWA

SUSFOOD
COFASP
WoodWisdom

Interface

ERA-Industrial Biotechnology
ERA SynBio
ERASysAPP

ERA-BioEnergy

need for information exchange

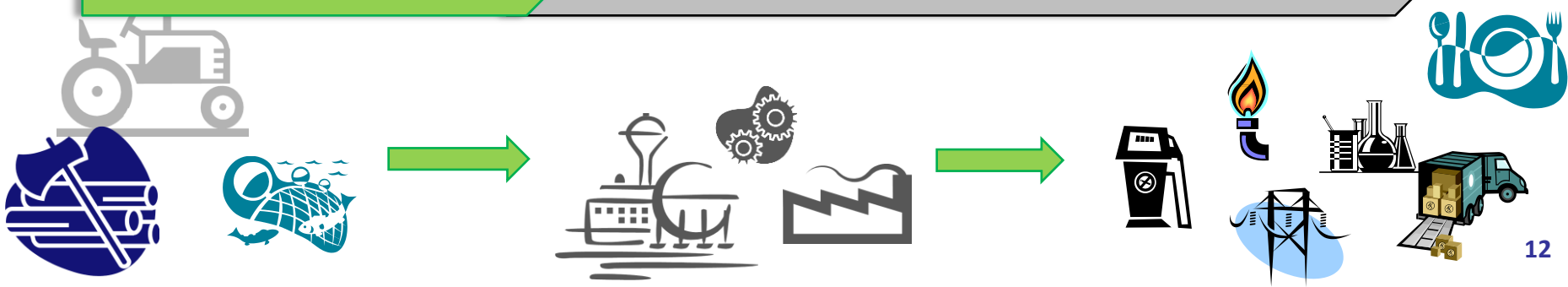
alignment of measures

CWG Integrated Biorefineries – MS/AC driven Lighthouse Projects

need for information exchange

alignment of measures

PPP BRIDGE – Industry-driven Value Chains



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Integrated Biorefineries – a definition

Integrated Biorefineries – a definition

- Star-COLIBRI: “the core concept embedded in all definitions is the conversion of biomass into several product streams (materials, chemicals, energy, food and feed) and the integration of various technologies and processes in the most sustainable way.”

Integrated Biorefineries – a definition

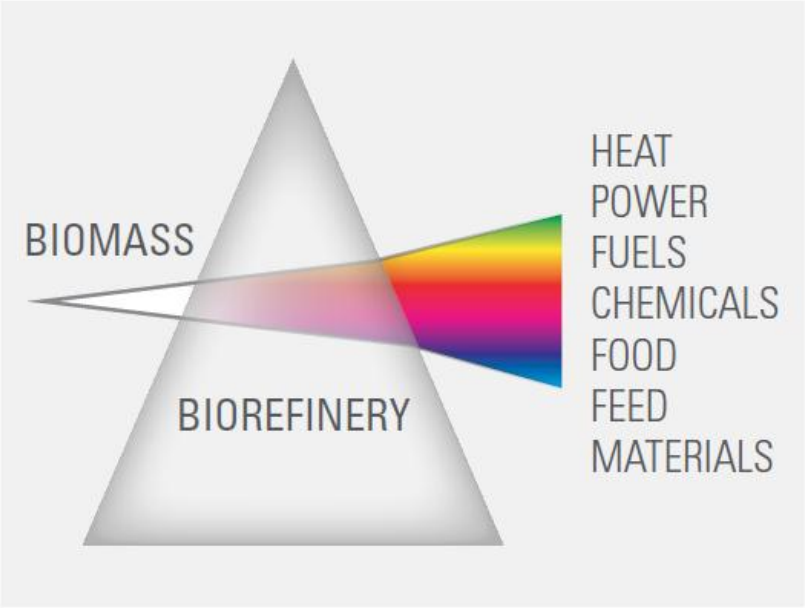

Figure 1: Schematic representation of the biorefinery concept
IEA Bioenergy Task 42 Biorefinery, 2009

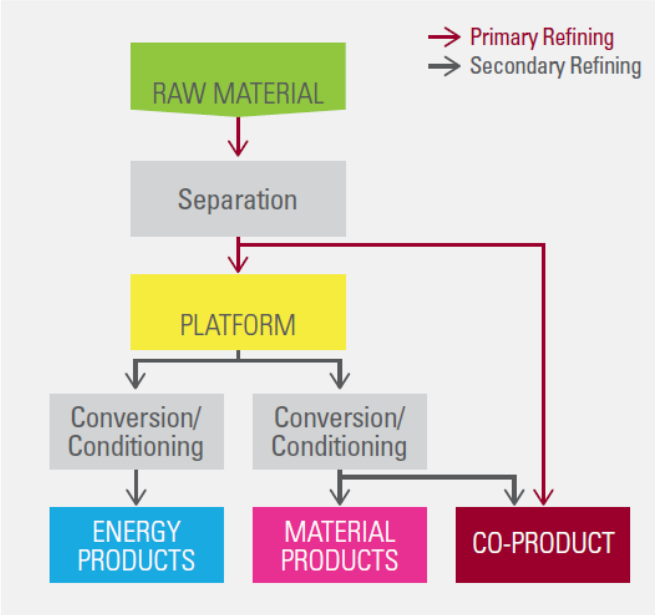

Figure 2: The different components within the Biorefinery Concept (According to IEA Task 42 Biorefinery systematics, 2009; adapted and modified by German Agency of Renewable Resources (FNR)[3])

Integrated Biorefineries – a definition

- Star-COLIBRI: “However, the biorefinery concept goes beyond the philosophy of oil refineries, by including sustainability management practices and closed loop processing cycles wherever possible. This aims to mimic the natural, global scale, carbon cycle. […] More generally, the biorefinery concept includes the management of all sustainability issues, including environmental, economic and societal factors.”

Integrated Biorefineries – examples

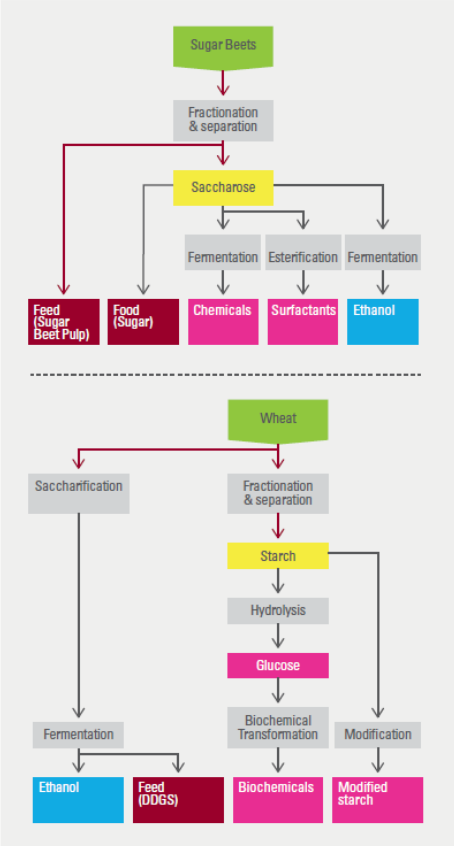

Figure 10: Schematic diagrams of Sugar Biorefinery (top) and an example of a Starch Biorefinery (bottom) (modified from IEA Bioenergy Task 42 Biorefinery systemetics [51])

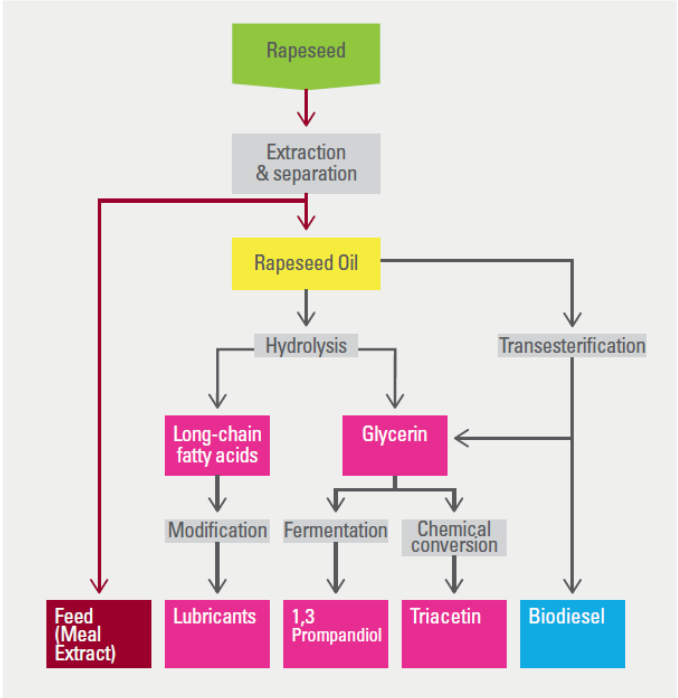

Figure 11: Schematic diagram of an example of an oilseed biorefinery. According to IEA Bioenergy Task 42 Biorefinery systemetics[53] modified by German Agency of Renewable Resources (FNR)

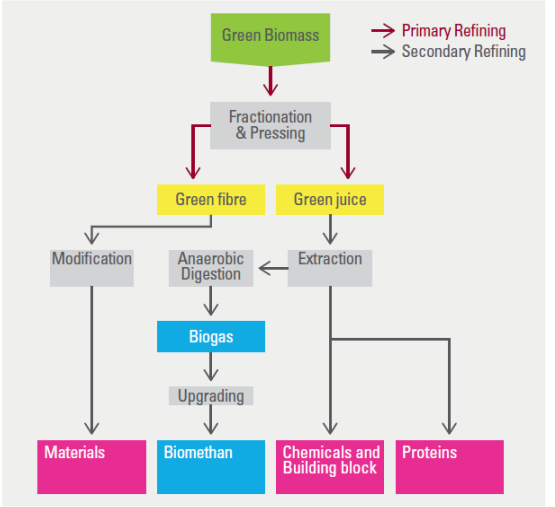

Figure 12: Schematic diagram of a green biorefinery[55]

Integrated Biorefineries – examples

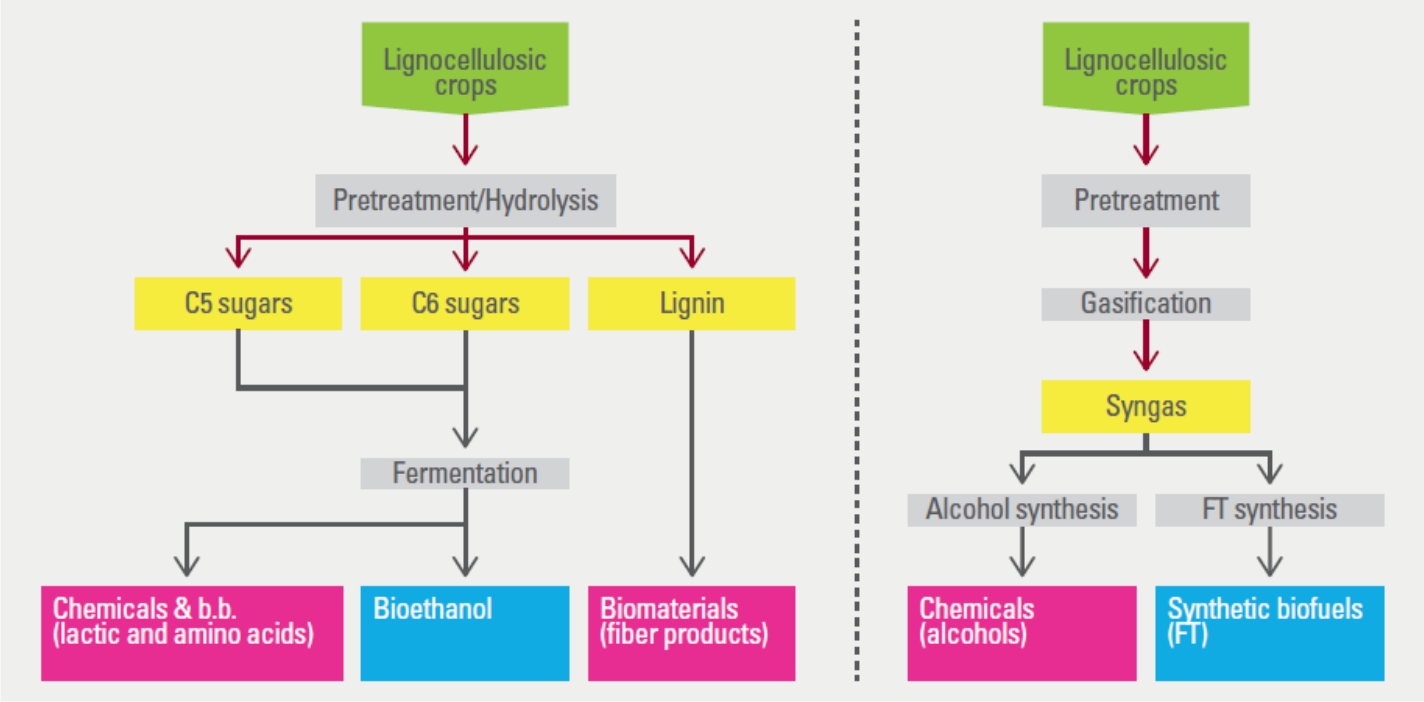

Figure 13 : Schematic diagram of the biochemical approach (*left-hand side*) and the thermochemical approach (*right-hand side*)[56]

Integrated Biorefineries – examples

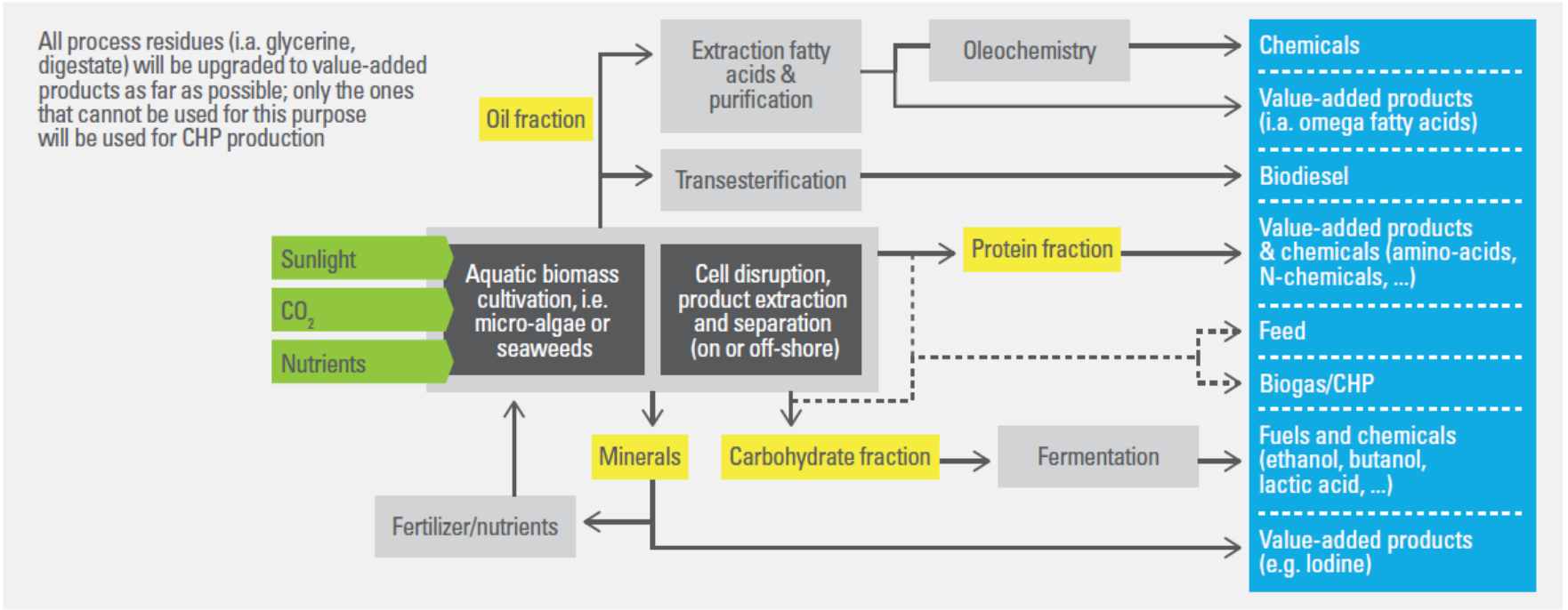

Figure 14: Schematic diagram of an aquatic (marine) biorefinery[57]

Integrated Biorefineries – a definition

Conversion of biomass into a **spectrum of marketable products** (materials, chemicals, energy, biofuels, food and feed) based on:

→ integration of various technologies and processes in the most sustainable way

→ maximizing economic efficiency, minimizing environmental impact

→ combination of different processing steps/technologies: upstream processing, transformation, fractionation, thermo-chemical and biochemical conversion, extraction, separation, and downstream processing

→ various biomass sources: Crops, organic waste, agricultural and forestry waste, wood and aquatic biomass

→ many marketable products (intermediates and final products) for which a market already exists or is expected

Nomenclature / classification

- according to the four structural elements: raw material, platform, products and processes
- central element of the classification are the intermediates, that are the products of primary refining (the platform)
- based on the plaform, raw materials and products are then assigned
- processes are the joining elements

- example: Syngas-biorefinery (platform syngas) on the basis of straw (raw material) for biofuels and chemicals (main products)

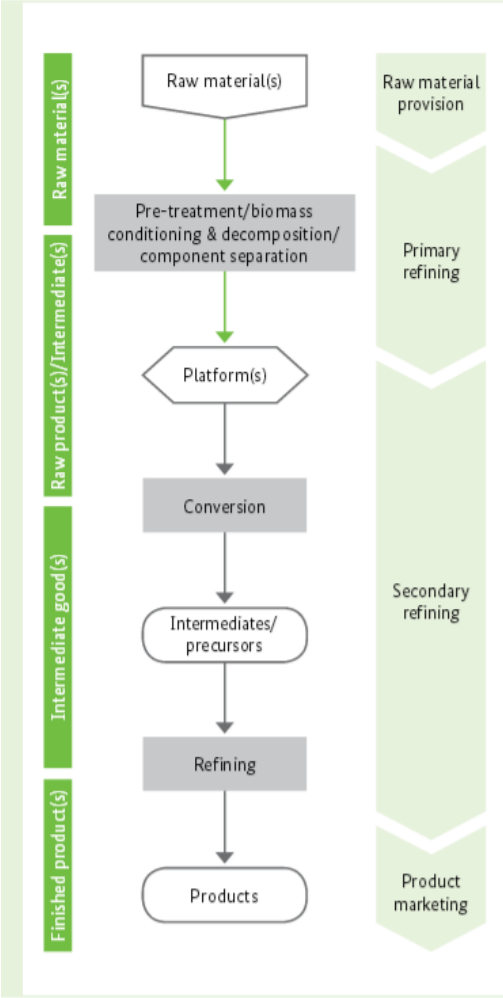

Figure 2: Schematic illustration of the biorefinery process chain

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Draft work plan – what we want to achieve

CWG-IB Draft Working Plan – an Overview

- Starting phase: build **a common basis and assess status quo**
  - Kickoff Meeting: reach agreement on definition work plan
  - 1st meeting: survey of biorefineries and current national funding programmes
  - 2nd meeting: analysis of overlaps/gaps/opportunities in the different funding programmes or synergies in existing biorefineries

→ European biorefinery map?

CWG-IB Draft Working Plan – an Overview

- Follow-up phase: build **a common basis for future collaboration**
  - 3rd meeting: overview of intended national programmes, open calls, overlaps, possible alignments, potential transnational projects?
  - 4th meeting: CWG results - cooperation in existing programmes, potential for multi-national flagships, ERA-Net strategy? Topics for the next Horizon2020 work programme or other options? Report/white paper?
  - Follow-up Meetings?

CWG-IB Draft Working Plan – an Overview

- In general:
  - need of an expert/scientific group to give ad-hoc input on certain aspects?
  - combination of CWG meetings with visits to active biorefineries in order to get a more comprehensive picture?

Important points

- date of the next meeting
- „homework assignment“

Thank you!