

# IEA Bioenergy Task42 Biorefineries

## IEA Bioenergy

The International Energy Agency (IEA) implements an international energy programme in response to oil shocks. Activities aim to improve energy security, economic and social development, and environmental protection through collaborative development of new and improved energy technologies. IEA Bioenergy is an organisation set up in 1978 with the aim of improving cooperation and information exchange between countries that have national programmes in bioenergy research, development and deployment. It aims to accelerate the use of environmentally sound and cost-competitive bioenergy on a sustainable basis.

## Participants

- Austria
  - Canada
  - Denmark
  - European Commission, DG Research
  - France
  - Germany
  - Ireland
  - Netherlands
- As of 2009: Australia and Italy

## IEA Bioenergy Task 42

IEA Bioenergy aims to improve cooperation and information exchange between national programmes in bioenergy research, development and deployment. Bioenergy Task 42 covers a new field with a large potential. Opening up this potential requires system and technology development. R&D-programmes are needed to link industry, research institutes, universities, governmental bodies and NGOs, and market introduction strategies need to be developed. Major outputs include a biorefinery classification system, country reports describing and mapping current processing potential and key biorefinery initiatives and platforms bringing together biorefinery stakeholders (industry, policy, NGOs, research).

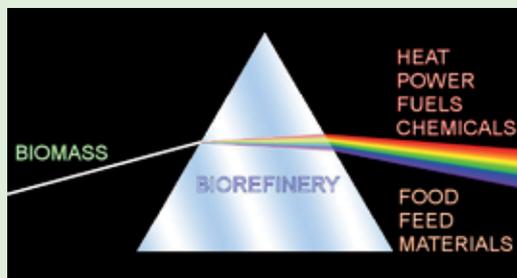


Figure 1: Biorefinery and its role in the transformation of biomass.

## Definition of Biorefinery

Biorefinery is defined as the sustainable processing of biomass into a spectrum of marketable products and energy. The definition includes the following aspects:

- **Biorefinery:** concepts, living plants, processes, clusters, systems
- **Sustainable:** maximising economic, environmental and social benefits and minimizing impacts, fossil fuel replacement, closed-cycles
- **Processing:** upstream processing, transformation, separation, thermochemical and (bio-)chemical conversion, extraction, downstream processing
- **Biomass:** wood and agricultural crops, forest and agricultural residues, wood, manure, organic residues, aquatic biomass
- **Spectrum:** multiple energetic and non-energetic outlets
- **Marketable:** a market is expected to become available, taking into consideration both market volumes and prices
- **Products:** intermediates and final products, i.e. food, feed, materials, and chemicals
- **Energy:** fuels, power and heat.

## Classification system

A classification system was developed describing platforms, products, feedstock and conversion processes. *Platforms* (e.g. sugars, syngas) are intermediates which connect biorefinery systems. *Product groups* include energy (e.g. bioethanol, synthetic fuels) and materials (e.g. chemicals, food and feed). Main *feedstock groups* are agricultural energy crops (e.g. starch crops, short rotation forestry) and residues from agriculture, forestry and industry (e.g. straw, bark, wood chips). Main *conversion processes* are (bio-)chemical (e.g. fermentation), thermo-chemical (gasification), chemical (synthesis, esterification) or mechanical (pressing). Examples of classifications are: 'C6 sugar platform biorefinery for bioethanol and animal feed from starch crops'; or 'syngas platform biorefinery for FT-diesel and phenols from straw'.