

Chances for biomass

Connecting Food and Non-Food – A roadmap for integrated valorisation



FOOD & BIOBASED RESEARCH
WAGENINGEN UR



Vision and examples

The 'Chances for biomass: integrated valorisation of biomass resources' project was initiated by the Dutch Ministry of Economic Affairs (EZ) in 2011/12 to gain a better insight into the interactions between the various biomass application domains. Current applications mainly seem to be focused on the Food and Non-Food domains without taking into account the integrated valorisation and the value pyramid for the sustainable application of biomass raw materials. The project therefore outlines a vision on integrated valorisation of biomass resources in accordance with the value pyramid Food – Animal feed – Functional materials – Fuel in large-scale and specialised applications.

The results of and recommendations from the project, including a clear vision on the integrated valorisation of biomass raw materials, insights from the industry with regard to biomass innovation trajectories, promising sample cases and a clear roadmap, will be of interest to various target groups.

Implementation in practice

Businesses: To inspire and bring together links within chains and between application domains in partnerships and develop new, innovative processes for integrated valorisation

Governments: Developing policy tools and stimulating PPP constructions and the so-called 'Top Sector' policy while taking into account integrated valorisation aspects.

Knowledge institutes: Acquiring knowledge and backgrounds related to the acceptance of new innovations within the application domains and creating insight into starting points from social debates related to Food and Non-Food issues.

Knowledge & expertise

Wageningen UR is the knowledge institute, renowned for using its excellent know-how and expertise in the field of food and biobased materials to lead the way in developing technological and concept-oriented innovation processes and contribute to increased sustainability in chains and a better quality of life.

Food & Biobased Research: Your partner in innovative applications for the transition to the integrated valorisation of biomass.

Interested? More information?

The scientific report and summaries with the project results are available online.



Information

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Integrated valorisation of biomass

Biomass is expected to become an increasingly important factor in meeting our need for functional materials, fuel, food and animal feed over the coming decades. These demands will rise due to a growing world population, changing consumption patterns, increasing prosperity and the unsustainable use of fossil fuels. This study contains a roadmap for achieving a more productive and efficient use of resources, while simultaneously limiting the consequences for the environment. The concept of attaining '2 times more with 2 times less' serves as the underlying vision for the roadmap. And a crucial component of this vision is integrated valorisation: Biomass used across all relevant domains, whether food, feed, functional materials or fuels.

Value pyramid: A rule of thumb to achieve the best possible application

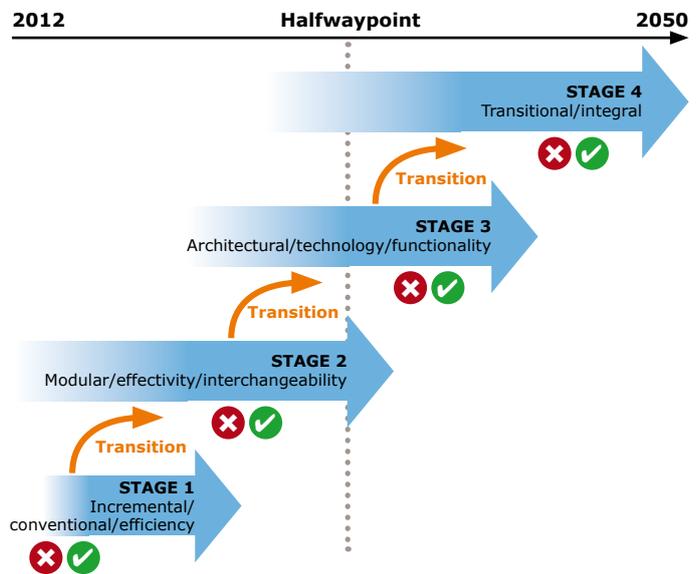
The first reference point on the road to integrated valorisation is the hierarchy of values for biomass applications.

- 1 *Food* for human consumption;
- 2 *Feed* for animals;
- 3 *Functional materials* and products (e.g. paper, biodegradable packaging, building materials and basic chemicals);
- 4 *Fuels* and their applications.

The second key reference point on the way to integrated valorisation is a parallel focus on short and long-term developments. The required steps are indicated in a roadmap for the integrated valorisation of biomass. It consists of four stages that need to be covered in order to valorise biomass resources for the four application domains in an integrated way. Each stage combines a fundamental line of research with practical implementation of applied knowledge. This ensures the necessary development of knowledge and technologies in later stages of the transition.

The greatest opportunities are at the intersection of several domains

Cross-sector and cross-domain – these are key factors in the integrated valorisation of biomass raw materials. By looking beyond what we know and stepping outside our comfort zone, taking on an active stance and being open to change, all parties involved can contribute to the process.



Stages of transition to integrated valorisation of biomass resources.

Recommendations specific to knowledge institutes

- Contribute to fact-based decision-making by providing insights into:
 - the sustainability impact of the planned transition steps, including unintended effects and mitigation strategies;
 - criteria for establishing the quality, quantity, function and durability of processes for replacing fossil fuels with renewable resources;
 - signal indicators and monitoring tools which measure progress from an integrated perspective that transcends the interests of individual stakeholders.
- Develop new knowledge about crops and breeding to develop new plant varieties with which integrated valorisation can take place more efficiently in all areas.
- Make the positive impacts and negative externalities of product and process innovations transparent from an integrated perspective.
- Develop mild process technologies for biomass fractionation and integrate this knowledge in order to make sustainable bio-refinery routes possible.

