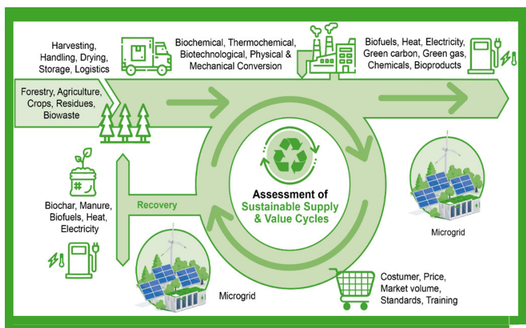


Key Driver: Sustainability

Dißauer Christa
Fuhrmann Marilene
Matschegg Doris
Strasser Christoph

AREA 3 – Sustainable Supply and Value Cycles

Developing and implementing sustainable bio-based systems

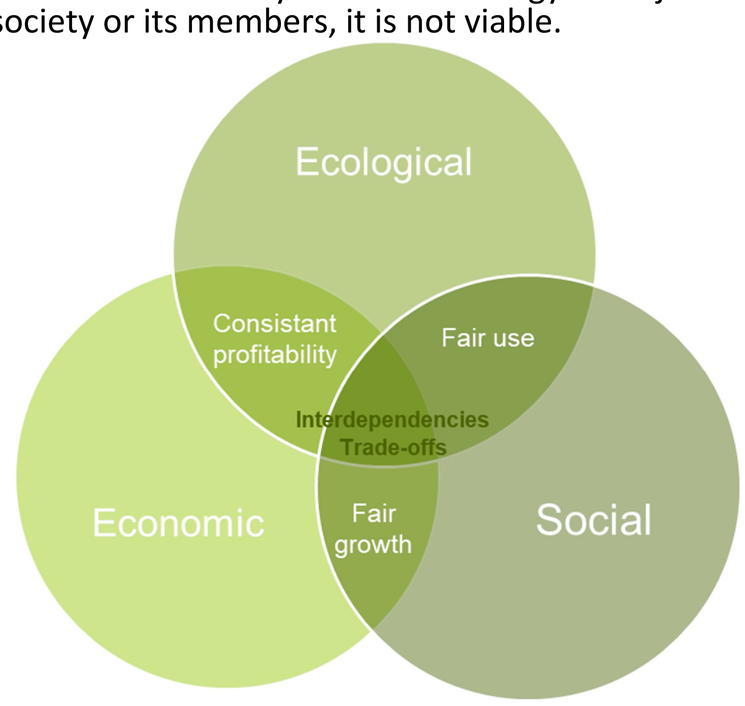
…contributes to several of the 17 Sustainable Development Goals (SDG)

UN Sustainable Development Goals

…needs to address the three dimensions of sustainability: the ecological, economic and social dimension.

Balancing the economic, social and environmental dimensions is key to achieving sustainable processes.

- **Ecological sustainability** is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future.
- **Economic sustainability** encompasses macro-economic as well as financial costs and benefits.
- **Social sustainability** is about identifying and managing impacts on people. Social acceptance is a prerequisite to social sustainability: if a technology is rejected by a society or its members, it is not viable.



Dimensions of Sustainability

Sustainability Assessment Methodologies

Techno-Economic Assessment and Life Cycle Costing

- A techno-economic assessment is an integrated evaluation of the technological performance and economic feasibility of a (new) process or value chain.
- The life cycle cost assessment (LCC) is an economic evaluation of a product or an engineering project across its lifetime.

Life Cycle Assessment (LCA)

LCA is a technique for assessing the environmental aspects associated with a product over its life cycle. The most important applications of LCA are:

- analysis of the contribution of the life cycle stages to the overall environmental load, usually with the aim to prioritize improvements on products or processes
- comparison between products/systems/processes

Assessment of Social Acceptance and Social Sustainability

- A general method to assess the social sustainability is the Social Life Cycle Assessment (S-LCA). S-LCA can be quantitative, semi-quantitative or qualitative, and complements the environmental LCA and LCC.
- Social acceptability can be studied using well-known survey techniques, and the information gathered can inform further efforts to understand the social sustainability of technologies via stakeholder involvement and multi-actor approaches.

Sustainability Assessment

…is conducted for research activities, supporting decision-making and policy in a broad environmental, economic and social context.

…is the process of identifying, measuring, and evaluating the potential impacts of alternatives in regard to the three dimensions of sustainability

…should be

- accurate
- reliable
- open and transparent
- using integrated approaches

Sustainability Assessment @BEST

Sustainable as well as resilient biomass supply and technologies are key factors for the success and competitiveness of bio-based systems.

BEST sustainability Quick-Check

A quick check for the biobased systems and processes addressed in BEST 4.0 projects is under development. Presumably, the following sustainability indicators will be considered:

- Biomass availability
- Eco-efficiency
- Substitution
- Up-cycling
- Resilience
- Social acceptance

The Bio-Value-Tool

Selected sustainability indicators will be integrated in the "Bio-Value-Tool" within the SusBioEcon project. The calculation tool (first developed in the BioEcon project as "Wood-Value-Tool") enables a techno-economic assessment (investment, operating and raw material costs, market potential, mass and energy balances) of selected biomass value cycles. Integrating the sustainability criteria facilitates to derive recommendations regarding sustainable supply and distribution strategies as well as to increase the resilience of bio-based systems.

Assessment of technology development

Main objective of the SusSys project is to evaluate the main technological developments (**Green Gas, Bio-H_2, Aviation Biofuels**, etc.) in future projects of BEST 4.0 via LCA & LCC for the whole value cycle. This enables a quantification of the contribution made to a sustainable economic system.

BEST – Bioenergy and Sustainable Technologies GmbH

Head Office Graz
Inffeldgasse 21b
A 8010 Graz

P +43 5 02378-9201
office@best-research.eu
www.best-research.eu

FFG Forschung wirkt. | Bundesministerium Arbeit und Wirtschaft | Bundesministerium Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie | wirtschaftsagentur wien | Für die Stadt Wien | Niederösterreich | Das Land Steiermark – Wirtschaft, Tourismus, Regionen, Wissenschaft und Forschung | SFG Neues Denken. Neues Fördern.