

**Challenges of Sustainable Bioeconomy: De-Materialization,
De-Carbonization, Re-Cycling and Re-Arrangement of Resources –
Vision 2025/2050**

Dr. M. Kern, Director, agriExcellence e.K., Germany

info@agriexcellence.de

Bioeconomy is a new concept for the use of natural resources. Bioeconomy is the knowledge-based production and utilization of biological resources, innovative biological processes and principles to sustainably provide goods and services across all economic sectors, especially relevant for crop production and crop improvement.

Examples addressing the following five areas will be presented:

1. **De-Materialization: “Do more with less!”** Save resources by digital farming.
2. **De-Carbonization: “Do it better!”** Replace fossil fuels in agriculture by renewable energy.
3. **Re-Cycling: “Do it without waste!”** Establish biorefinery systems.
4. **Re-Arrangement of Resources: “Do it by creating values!”** Use modern biotechnology methods in crop improvement.
5. **And: “Do it in an appropriate time!”** Authorize/regulate necessary methods future oriented.

Finally, **Vision 2050** will be presented focusing on:

1. Implemented functioning bioeconomy
2. Free fossil fuel agricultural production
3. Dominance of biotech/robot/digital farming
4. N₂-fixation from the atmosphere by all key crops
5. Doubling of crop production
6. Tripling of plant based protein production (food & feed)
7. Tripling of greenhouse production systems
8. Tripling of pollination services
9. Personalized nutrition
10. “Cero” hunger.

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