

Trends

Bioeconomy: Potentials and Barriers

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The potentials of the Bioeconomy

- Bioeconomy can deliver most efficiently to the Horizon 2020 Vision:
- EU as a Smart, Sustainable, and Inclusive Society, creating
 - Jobs
 - Local development –also in rural and coastal areas
 - Increased resource-efficiency and productivity
 - Technology Export
 - Increased competitiveness

The Bioeconomy strategy

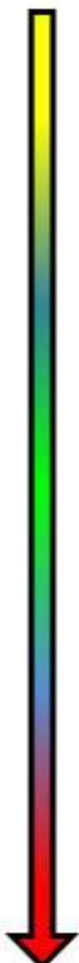
- To include all relevant and sustainable bioresources
 - not only crop residues; include also
 - Industrial by-products and side streams
 - Industrial and household waste

and

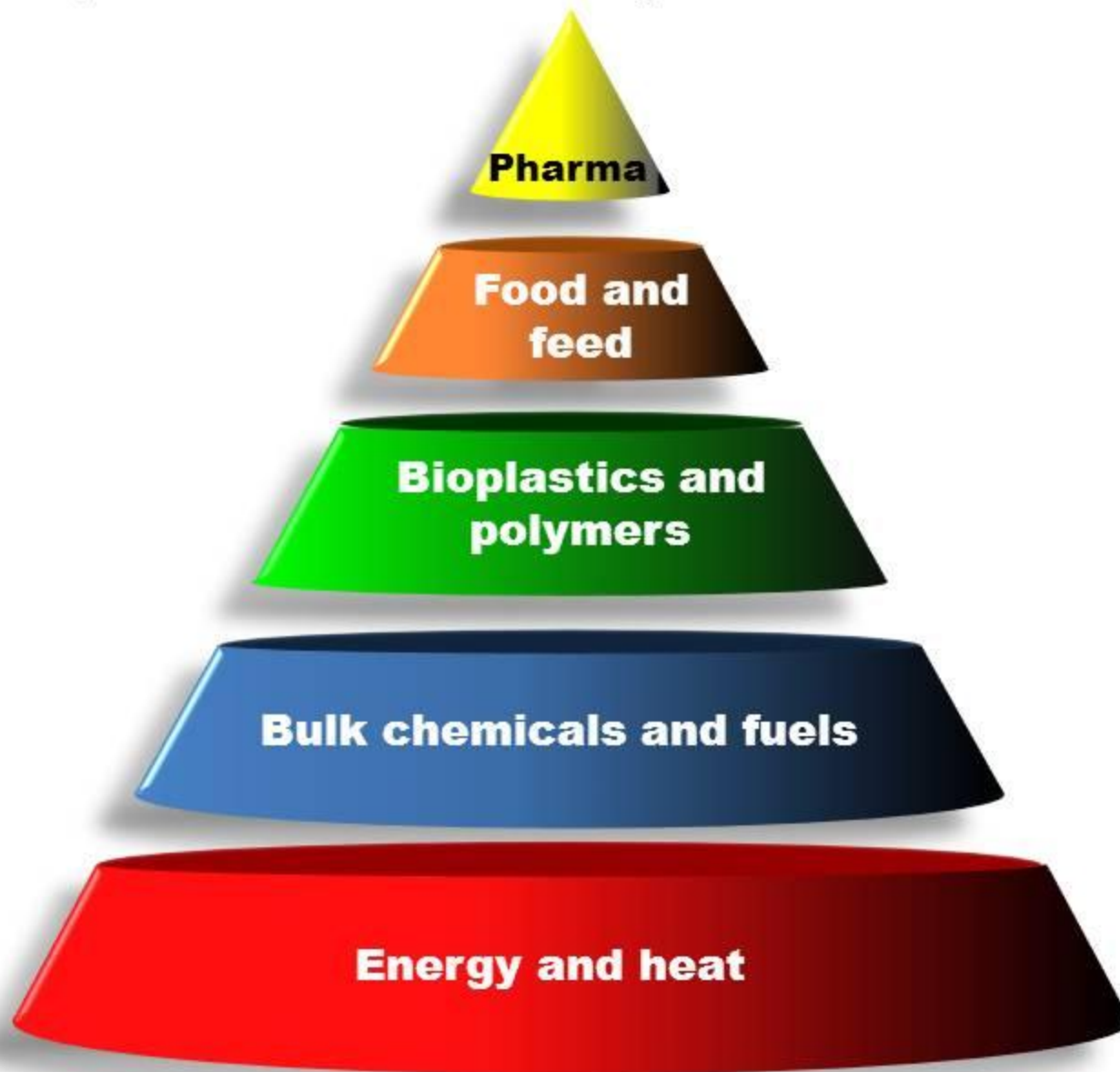
- To unlock the full potentials of the biological materials
 - not just bioenergy (bulk/low value)

Biomass cascade : High value compounds at the top, residual biomass for production of electricity and heat at the bottom

High value



Low value



Biorefinery process technology

- Biorefinery technologies must be optimized to allow for recovering the value cascade, e.g.:
 - Protein recovered upfront
 - Pretreatment should not decompose Hemicellulose polymer before higher value food and feed ingredients has been recovered
 - Phosphorous nutrients to be rescued

Current obstacles

- Uneven playing field for different biomass uses (e.g. subsidizing biogas)
- Only market incentives (e.g. blend-in directive) for biofuel
- Segmenting energy and food in R&D funding options
 - NOT giving incentives for optimized biomass utilization

Current obstacles (cont)

- Too limited funding for developing support technologies (e.g. ICT for resource efficiency not only ICT for energy efficiency)
- Regulatory barriers for upcycling of waste streams
 - currently restrictions beyond what is based on safety precautions

MANY TYPES OF BIOREFINERIES

-MANY NEW VALUE CHAINS (NEW ENZYMES NEEDED)

THE YELLOW **BIOREFINERY** (STRAW AND CORN STOVER)

THE GREEN **BIOREFINERY** (FRESH GREEN LEAVES)

THE GREY **BIOREFINERY** (FROM SLUDGE => BIO OIL!)

THE BLUE **BIOREFINERY** (MARIN, SEAFOOD WASTE & ALGAE)

THE WHITE **BIOREFINERY** (AGROINDUSTRIAL WASTE)

Most Wanted:

- Clear political signals towards increased sustainability
 - no up front choice of specific technologies
- Improved framework conditions
 - building positive investment climate
 - stimulating creation of markets
- Common decision on future Bioeconomy goals
 - binding targets for resource efficiency

The Harley Davidson Principle: Stop dreaming –start driving!

