

BIOREFINERIES

RESOURCE EFFICIENCY EXEMPLIFIED

Biorefineries – the ‘factories’ where biomass, including crops, wood, forest and agricultural residues are converted into everyday materials – are critical to using renewable resources more efficiently. New biobased products, including chemicals, bioplastics, fuels, food and feed are already enabling the EU to move away from fossil carbon imports and towards a home-grown renewable future.

In this way biorefineries will also play a critical role in creating the circular economy as this model also relies upon finding new ways to extract value from available materials, including wastes and residues. Biorefineries are increasingly offering new ways to use renewable resources and add value to them, creating jobs and growth in rural, coastal and deindustrialised areas in the process.

Over the last 150 years fossil carbon based refining has become more sophisticated and efficient, producing a broad range of products. The same will increasingly be true for the biorefineries being developed around the world. But building a biorefinery requires considerable financial investment, so a long-term and coherent policy framework is needed in order for Europe to attract the levels of investment necessary to lead the development of a biorefining future.

4 facts about biorefineries



Biorefineries use enzymes, chemical catalysts and micro-organisms as well as mechanical and physical processes, such as pressure and heat, to efficiently convert renewable raw materials into the valuable components that go into every day products, from cosmetics, to fuels, to plastics and pharmaceuticals.

Biorefineries are designed to make the most efficient use of the available biomass and are capable of producing multiple products from one single feedstock.



Biorefineries are often located in rural areas, close to a source of renewable raw materials to be used as feedstock: this provides jobs and growth for rural communities and adds value for farmers, forest owners or for those living in rural, coastal and de-industrialised areas.

Almost all of the 100,000 fossil-carbon based chemicals that are currently derived from crude oil, coal and gas could, theoretically, be replaced by alternatives developed from plant based materials. In plant based materials the carbon used is atmospheric CO₂, meaning this development would help to mitigate the impacts of climate change.¹

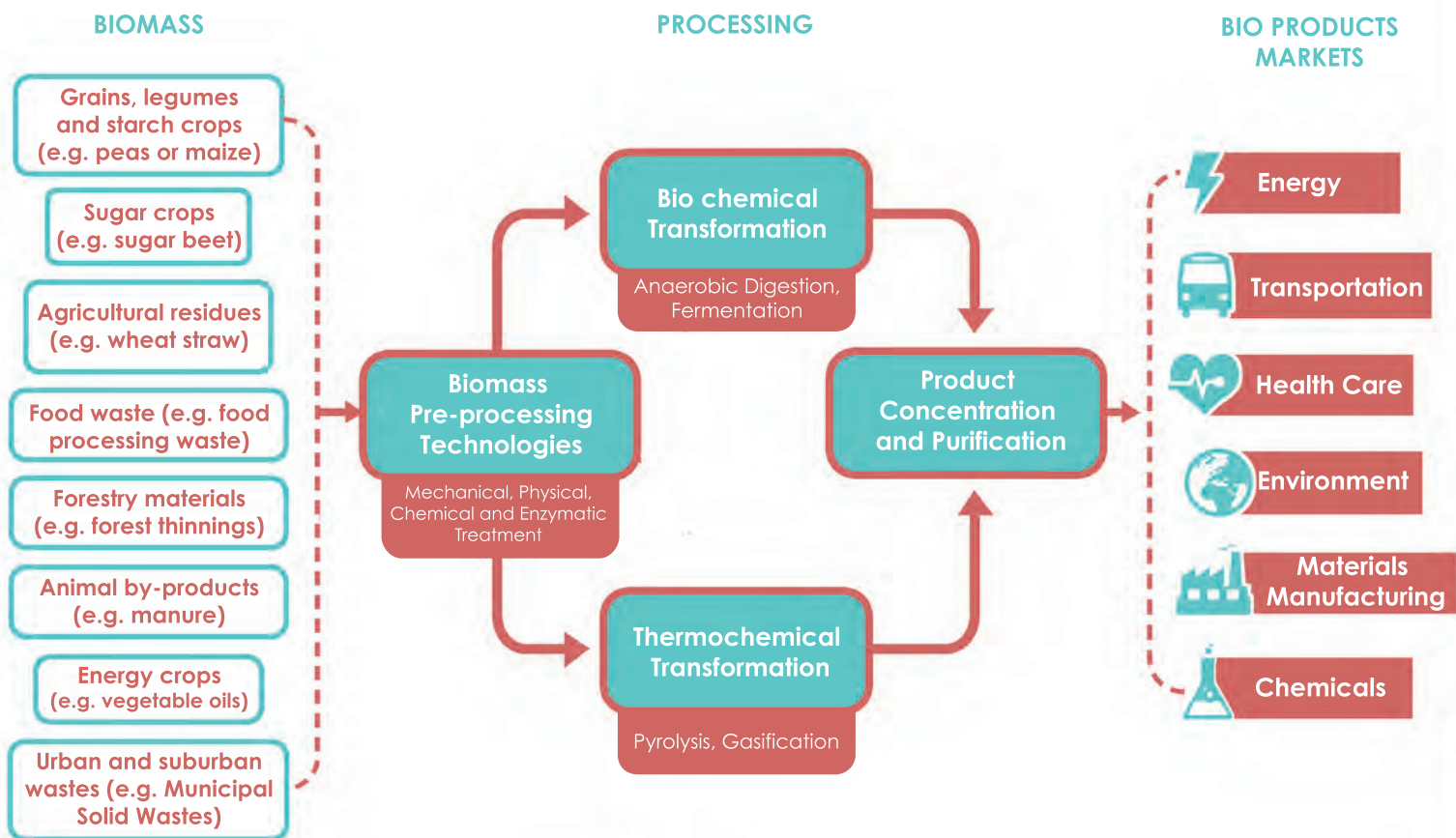


References:

1. IEA Bioenergy: <http://www.ieabioenergy.com/wp-content/uploads/2013/10/Task-42-Biobased-Chemicals-value-added-products-from-biorefineries.pdf>

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A BIOREFINERY USING
270,000
TONNES OF AGRICULTURAL
WASTE PER YEAR CAN PRODUCE¹



75,000,000
13 MW

liters of ethanol
electricity, making it entirely
self-sufficient

The ethanol produced can reduce greenhouse gas
emissions by up to 90% compared to petroleum-based fuel



THE LARGEST BIOREFINERIES IN
EUROPE CAN PRODUCE OVER
700 DIFFERENT PRODUCTS²

302,000
MAN YEARS

EMPLOYMENT THAT EU
BIOREFINERIES BRING TO RURAL
AREAS³

"The vision of a more competitive, cleaner, renewable, circular bioeconomy has biorefineries at its heart. For many sectors, from farmers to foresters right through to consumer brand manufacturers, biorefineries already represent the 'factories' that are helping provide a wide range of everyday products - including food, feed, fuels and materials - made from bio-renewable, rather than finite fossil resources. Increasingly, they will play a vital role in providing solutions to the grand challenges that face us and generations to come, including creating jobs and growth, reducing CO₂ emission, using resources more efficiently and improving food and energy security"

Stephen Tanda, Board member, DSM and Chairman Industrial Biotech Section, EuropaBio

References:

1. Novozymes, 2014: <http://www.novozymes.com/en/about-us/brochures/Documents/crescentino-fast-facts-logo.pdf>
2. EuropaBio, 2014
3. 2011-2030, "Moving towards a next generation ethanol economy," Bloomberg new energy finance, 2012