BIOBASED INGREDIENTS FOR **LIFE AND MATERIAL SCIENCES**

AFYBIO™

Innovative Solutions for Life and Material Sciences

AFYREN

GLOBAL CHALLENGES

As pressure on resources continues to increase, our planet's biocapacity is gradually shrinking. Because of the ever increasing gap between demand and supply of natural resources, we would need the equivalent of 1.7 Earths to meet our current needs.

Today, it takes

1.7 Earths

to meet our resource needs

The global population keeps growing and should reach **11.2 billion people before the end of the century.**

One of the consequences will be an increase in demand for natural and environmentally friendly products with reduced carbon footprints.

SPECIFIC ISSUES FOR...

MATERIALS SCIENCES

Today the main concern and innovation driver for companies in the materials sciences industry is to develop sustainable, smart, and responsive materials that also offer improved physical properties. Novel (space) formulations, including biomaterials, impart new functionalities to existing materials while expanding the scope of innovation.

15% **of the materials industry trends and INNOVATION focus on SUSTAINABILITY***

Companies in the construction, automotive, packaging, and manufacturing sectors are integrating sustainable materials and involving renewable energy sources into their processes. Eventually, these efforts aim to lessen the burden of waste on the planet. Sustainable materials also provide a boost for circular systems and allow for the implementation of a circular economy.

16% **of the GHG emissions** come from the industry. All industry sectors must review the way they produce their products the goal of **40%** **GHG REDUCTION by 2030 and CARBON NEUTRALITY by 2050**

LIFE SCIENCES

Sustainability is becoming a key priority for more and more brands across the ever-evolving cosmetics, hygiene, and life science industries.

In an effort to appeal to a growing population of eco-conscious consumers, companies are looking for ways to emphasize greener initiatives, without compromising on the quality and reach of products.

To reach carbon neutrality goals, companies are starting to experiment and formulate with biosynthetic ingredients like biobased feedstocks and palm oil alternatives.

THE GLOBAL ORGANIC BEAUTY MARKET
is expected to grow up to

10% **each year**

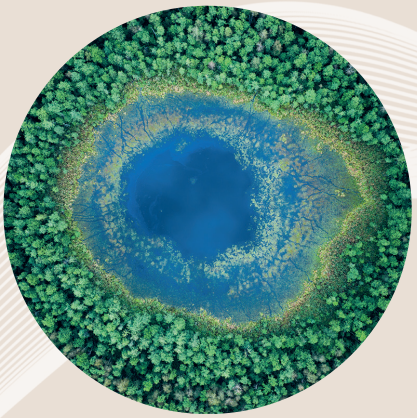
* According to the StartUs Insights

AFYREN'S COMMITMENTS

Afyren offers solutions that mitigate the impact of complex global problems and contribute to the development of a better balance between human needs and environmental resources.

Reduce waste and optimize circularity

Limit climate change



Preserve natural resources and biodiversity

DECARBONATION OF PRODUCTION AND CONSUMPTION

- GHG emissions reduction
- Replacement of fossil resources

NATURAL RESOURCE PRESERVATION

- No additional land use
- Highly renewable resources
- Natural fermentation process
- Low water consumption

WASTE REDUCTION AND FOSTERING CIRCULARITY

- Zero industrial waste
- Use waste or by-products as raw materials

TERRITORIAL REVITALIZATION

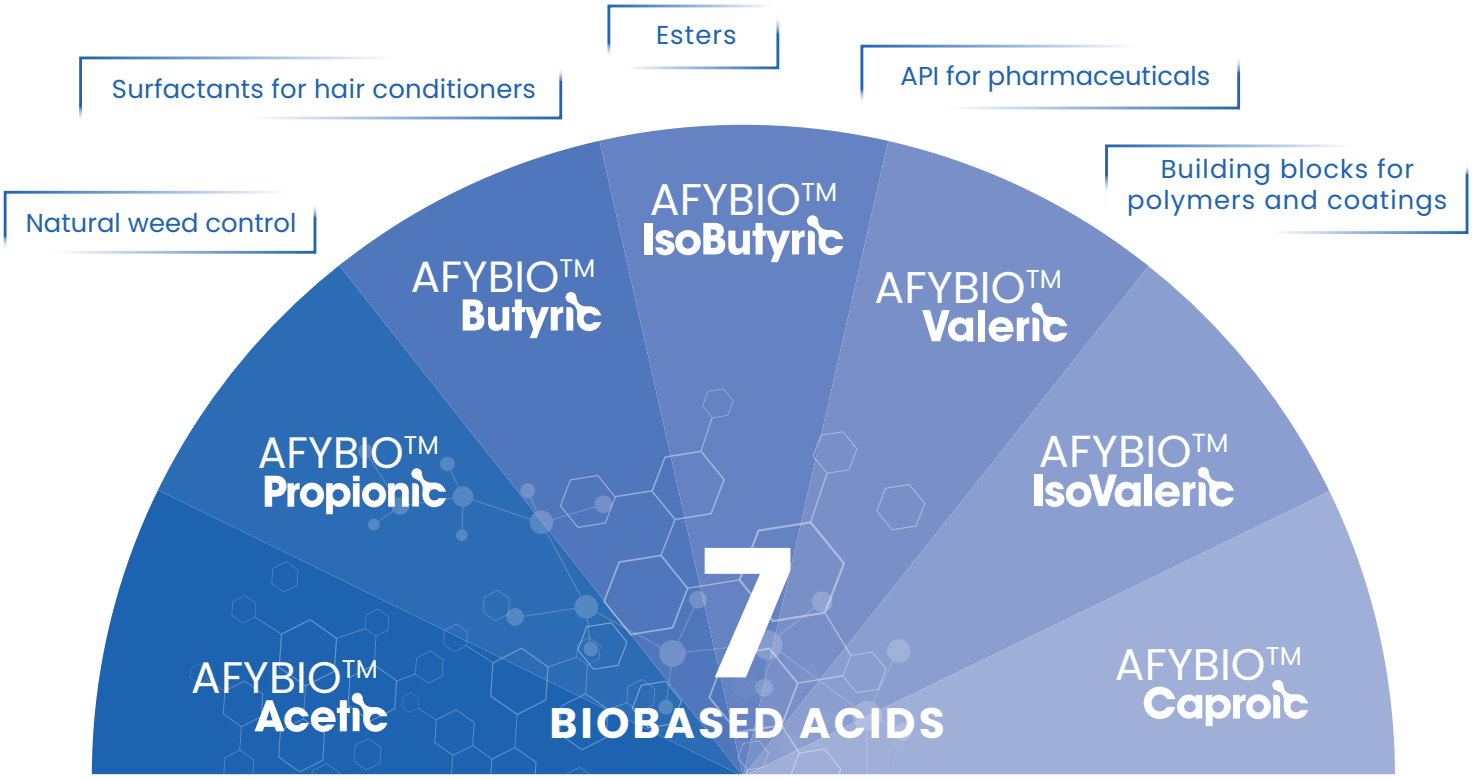
- Conversion of existing industrial sites
- Local value chains
- Employment

AFYBIO™ 100% **BIOBASED**

With a single process, AFYREN produces a range of 7 organic acids from C2 to C6 with versatile properties and applications.

AFYBIO™ acids can be used directly in the formulation or as building blocks for the synthesis of finished products or ingredients.

100% biobased with 81% carbon footprint reduction vs petrobased acids, AFYBIO™ acids will improve the overall life cycle assessment of the final products.



CERTIFICATIONS

AFYREN invests in the quality of its process and products to meet customer expectations.

Approved by ECOCERT RAW MATERIAL
COSMOS APPROVED

Approved by ECOCERT RAW MATERIAL
COSMETICS

ECOCERT®
NATURAL DETERGENT

GMO FREE

100% BIOBASED
ISO 16120-2 - ASTM 6866

PALM OIL FREE

AFYBIO™ ACIDS - A ROUTE TO SUSTAINABLE DERIVATIVES.

The most common reactions with carboxylic acids are esterification and the alcohol synthesis.

Esters can then be transformed into ketones and other derivatives for applications in the pharmaceutical and cosmetics industries.

In general, the esterification of AFYBIO™ acids leads to the production of polymers like Polyesters or base materials for coatings.

AFYREN PRODUCTS, BUILDING BLOCS FOR VARIOUS APPLICATIONS

AFYBIO™ **Caproic** acid

API for pharmaceuticals

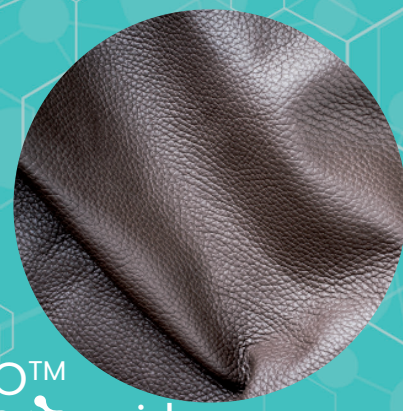
AFYBIO™ **Butyric** acid

- **Cellulose Acetate Butyrate** for transparent polymers (baby bottles)
- Building blocks for agrochemical applications (fungicides, herbicides, insecticides etc.)

AFYBIO™ **Acetic** acid

Solvent for nail varnish,

- Chlorides used for further processing of food products as well as PVC stabilizers
- Solvent for chemical synthesis



AFYBIO™ **Valeric** acid

- **Polyesters** for synthetic leather
- Building blocks for pharmaceutical applications

Nature is the future.

Now, more than ever it is time to move forward together toward a sustainable, competitive, innovative industry, combining ecology and economy.
With its biomimetic process and its of range of seven 100% biobased acids, AFYREN is revolutionizing the world of chemistry, opening up an unprecedented range of possibilities for innovation, new products and carbon footprint reduction.

JOIN THE AFYREN INITIATIVE AND SEIZE NEW OPPORTUNITIES FOR COMPETITIVENESS.

AFYREN

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