BIOBASED INGREDIENTS FOR **MATERIALS SCIENCE**

AFYBIO™

Innovative Solutions for Materials Science

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 material sciences industry is to develop more sustainable, circular and smart 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**

* According to the StartUs Insights

AFYREN'S COMMITMENTS

AFYREN'S 100% SEGREGATED* BIOBASED ACIDS REDUCE CARBON FOOTPRINT BY 5 COMPARED TO FOSSIL-BASED ACIDS:**

- Natural and innovative fermentation process
- Local, renewable and sustainable resources
- Fully circular model
- Renewable by-products as feedstock
- No direct competition with human food

By using **AFYREN'S** products, you

CONTRIBUTE TO DE-FOSSILIZATION OF THE INDUSTRY

... All while preserving natural resources and developing regional economy

- Local, safe and sustainable product procurement
- Low water consumption
- No additional land use
- No deforestation

What do **you** get?

THE POSSIBILITY TO DEVELOP AND PROMOTE INNOVATIVE AND SUSTAINABLE PRODUCTS WITH ADDED VALUE

REDUCED CARBON INTENSITY
- GHG emissions reduction (scope 3)
- Improved product carbon footprint (PCF)

POSITIVE BRAND IMAGE
- Improved scores for environmental certifications
- Contribute to your CSR strategy

ANSWERING THE MARKET'S DEMANDS
- Low carbon and fully circular
- 100% biobased and segregated*

EFFICIENT CHAIN OF CUSTODY
- Traceable and transparent
- Limited dependency on crude oil market

Be part of a sustainable future

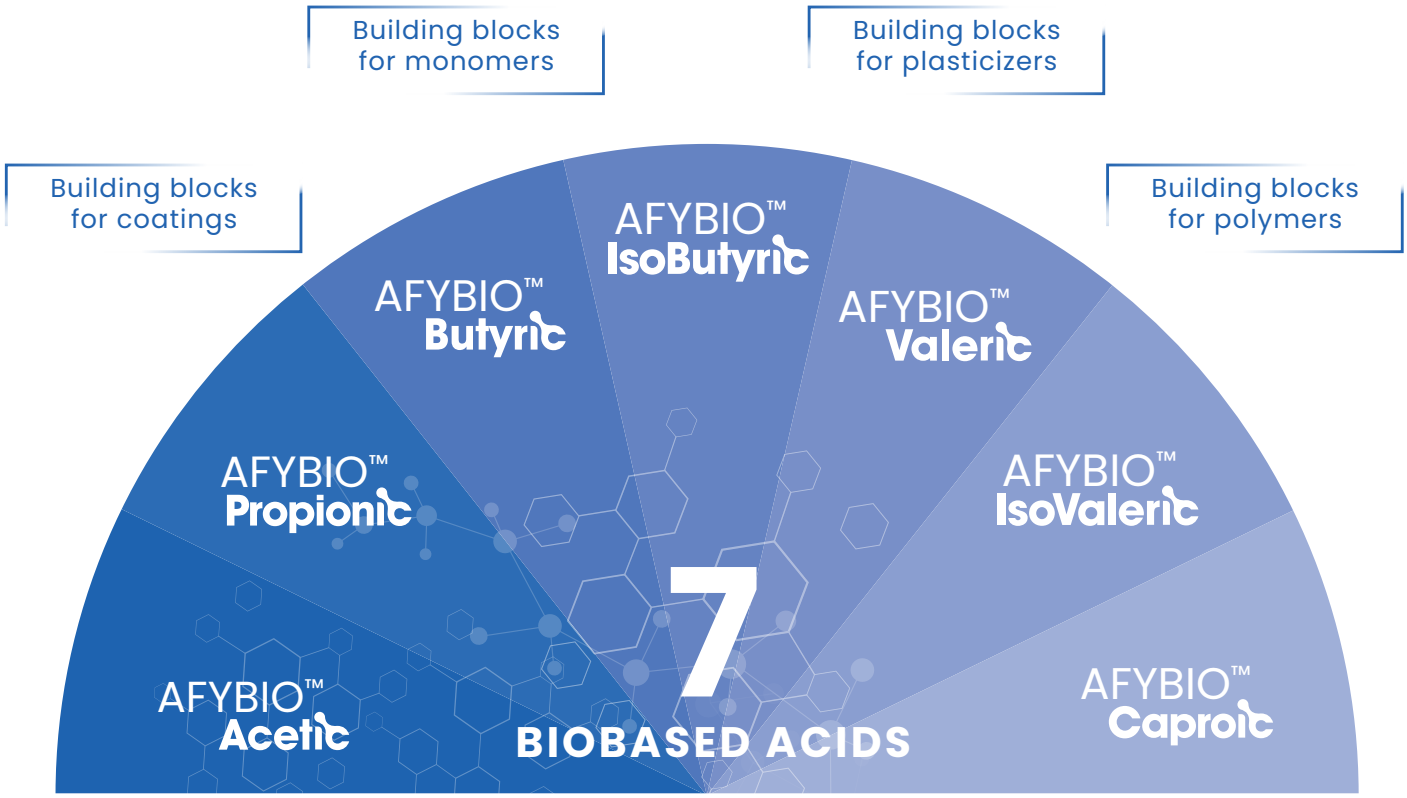
*Norm for biobased products
**Based on the Life cycle assessment conducted by SPHERA 2018-2019, updated 2020 following ISO 14040/14044

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 production which reduces the carbon footprint by 5 vs. production of petrobased acids for the French plant. 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.

GMO FREE

100% BIOBASED
ISO 16120-2 - ASTM 6866

AFYBIO™ ACIDS - A ROUTE TO SUSTAINABLE DERIVATIVES.

The most common reactions with carboxylic acids are esterification and the alcohol synthesis. In general, the esterification of AFYBIO™ acids leads to the production of polymers like Polyesters or base materials for coatings.

AFYREN PRODUCTS, BUILDING BLOCKS FOR VARIOUS APPLICATIONS

AFYBIO™ **Propionic** acid

Cellulose acetate propionate for glasses

AFYBIO™ **Butyric** acid

Cellulose Acetate Butyrate for transparent polymers (baby bottles)

AFYBIO™ **Acetic** acid

Solvent for chemical synthesis

Building Blocks for vinyl acetate monomer

AFYBIO™ **Valeric** acid

Plasticizer for synthetic leather

Now, more than ever it is time to move forward together towards 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 a 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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