

News Release

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BASF offers neopentyl glycol and propionic acid with product carbon footprint of zero

- **Cradle-to-gate product carbon footprint (PCF) of zero achieved through use of renewable raw materials via BASF's biomass balance approach**
- **Use of renewable energy and benefits of BASF's Verbund**
- **Drop-in solutions: identical product quality and properties**
- **Contribution to CO₂ emission reduction targets in powder coatings applications and feed, food, agricultural and fragrance industries**
- **BASF achieves Carbon Neutral certification from the Carbon Trust for cradle-to-gate carbon footprint of neopentyl glycol and propionic acid**

BASF for the first time offers neopentyl glycol (NPG) and propionic acid (PA) with a cradle-to-gate product carbon footprint (PCF)¹ of zero². Produced at BASF's Ludwigshafen Verbund site, Germany, the products are available globally as "NPG ZeroPCF" and "PA ZeroPCF." BASF achieves the zero PCF for NPG and PA by using renewable raw materials in its unique Verbund production system via its biomass balance (BMB) approach. For NPG, BASF additionally uses renewable energy for production.

NPG ZeroPCF and PA ZeroPCF are "drop-in" solutions: They are identical in quality and properties to the standard products, allowing customers to use them in their production without the need for adjustments to their existing processes. In this way, customers can simply and efficiently reduce emissions from purchased goods or services (Scope 3) and increase the share of renewable raw materials in the value chain, thus contributing to the shift to a circular economy.

Biomass balance approach with waste-based renewable raw materials

BASF manufactures NPG ZeroPCF and PA ZeroPCF in its integrated Verbund production system applying its BMB approach. For this, BASF feeds renewable raw materials into its Verbund in the very first steps of chemical production and attributes a corresponding share of the renewable raw materials to specific sales products by means of a certified mass balance method. The renewable raw material used is waste-based. BASF's biomass balanced products are certified according to recognized standards like either REDcert2 or ISCC plus.³ In the production of NPG ZeroPCF, BASF additionally uses renewable energies via Renewable Energy Certificates.

The PCF comprises the total greenhouse gas emissions that occur until the product leaves the BASF factory gate for the customer, from the extraction of resources through manufacturing of precursors to the making of the final chemical product itself. On its journey to achieve net zero CO₂ emissions by 2050, BASF is the first large chemical company to make the individual carbon footprints of all its sales products available to its customers.

NPG ZeroPCF and PA ZeroPCF certified Carbon Neutral by the Carbon Trust

BASF has achieved Carbon Neutral certification from global climate change consultancy the Carbon Trust for its NPG ZeroPCF and PA ZeroPCF. The Carbon Trust certifies products as Carbon Neutral that are either carbon neutral through temporary natural upstream carbon sinks like plants⁴ or through carbon credits purchased by the manufacturing company. BASF achieves the cradle-to-gate product carbon footprint of zero for NPG ZeroPCF and PA ZeroPCF without purchasing carbon credits.⁵ The certification will be reviewed on an annual basis.

Neopentyl glycol with broad application fields

An essential field of NPG application is powder coatings, especially for the construction and automotive industries as well as for household appliances. Besides emitting minimal to zero volatile organic compounds (VOC), the coatings process with powder coatings also reduces processing times and energy requirements. By applying NPG ZeroPCF, the carbon footprint of the powder coating resins can be reduced significantly. This can help manufacturers in the construction, automotive, white goods and furniture industries to achieve their upstream Scope 3 CO₂

emission reduction targets.

Due to its high chemical and thermal stability, the versatile polyalcohol NPG has proven itself in many further applications, in particular as a building block for the production of polyester and alkyd resins for various coatings and plastics. Other areas of application for NPG include the manufacture of lubricants, plasticizers and pharmaceuticals: It is used as a building block in the synthesis of, for example, hormones, cardiovascular drugs and painkillers. With decades of expertise, BASF is today among the leading NPG producers globally.

Wide range of uses for propionic acid

For decades, BASF customers have been utilizing PA, which is fully biodegradable, as a mold inhibitor for the preservation of food and feed grains. In this application PA offers economic and ecological benefits over preservation through drying or storage in airtight silos. Other application areas of PA include the production of crop protection agents, flavors and fragrances, pharmaceuticals, solvents and thermoplastics. With decades of expertise, BASF is among the leading PA producers globally.

¹ BASF's product carbon footprint (PCF) calculations follow the requirements and guidance given by ISO 14067:2018. In a methodology review, TÜV Rheinland has certified that the PCF methodology SCOTT developed and used by BASF SE for calculating the PCFs of BASF products is scientifically-based, is in accordance with ISO 14067:2018, and reflects the state of the art.

² The product carbon footprint (PCF) of NPG ZeroPCF and PA ZeroPCF is zero in a cradle-to-gate assessment, taking into account all product-related greenhouse gas emissions and the biogenic uptake of the renewable raw materials used in the value chain and attributed to the products via a certified mass balance approach. The calculation does not include downstream value chain emissions such as transportation emissions from factory gate to customer, emissions from further processing and the end-of-life emissions (e.g., from waste treatment).

³ REDcert2 and ISCC plus are standards for the use of sustainable biomass as raw material in the chemical industry. Regarding BASF's biomass balance approach, certification according to these standards confirms that the biomass used is sustainable and has been fed into the production Verbund in the required amount. It also confirms that the sustainable biomass has been correctly attributed to the corresponding sales products. The certifications are awarded on the basis of on-site audits conducted by independent auditors.

⁴ A carbon sink is a natural or artificial system that extracts more CO₂ from the atmosphere than it releases into it. Plants are an example of a natural carbon sink, as they remove CO₂ from the atmosphere through photosynthesis (biogenic uptake). The raw materials used in BASF's biomass balance approach are plant-based and the biogenic uptake is accounted for in the calculation of the cradle-to-gate product carbon footprint.

⁵ To achieve carbon neutrality for NPG ZeroPCF and PA ZeroPCF in relation to their complete product life cycle (cradle-to-grave), all downstream value chain emissions have to be offset by the respective actors in the value chain, e.g., by purchasing carbon credits.

Further information on BASF's ZeroPCF intermediates:

<https://chemicals.basf.com/global/en/Intermediates/sustainability/zero-pcf.html>

About The Carbon Trust

The Carbon Trust is a global climate consultancy driven by the mission to accelerate the move to a decarbonized future. It has been pioneering decarbonization for more than 20 years for businesses, governments, and organizations. A leader in carbon footprinting, the Carbon Trust certifies products, organizations and value chains around the world.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. Around 111,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio comprises six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €78.6 billion in 2021. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com