CLIMATE ANALYTICS

Decarbonising the chemical industry in Albania, Bosnia and Herzegovina and Serbia

Summary

December 2025

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Full report coming early 2026.

The chemical and petrochemical industries underpin virtually every aspect of modern economies, providing essential materials or inputs for agriculture, manufacturing, infrastructure, healthcare and consumer goods.

The production of chemicals is heavily reliant on fossil fuels and as such generates around 6% of global emissions from both direct and indirect sources. Indirect sources include e**nergy-related emissions** from both transport and production, the latter from the combustion of natural gas, oil, or coal in order to generate the high temperatures required (<1000°C) for chemical processes such as cracking, reforming and gasification. Direct sources include **process emissions**, where CO_2 and nitrous oxide (N_2O) are formed directly by chemical reactions, such as ammonia (NH_3) synthesis.

The sector's emissions profile is further complicated by its role in downstream applications. Chemical products often generate additional emissions when they are used and disposed of, contributing to Scope 3 emissions.

The EU's Carbon Border Adjustment Mechanism (CBAM), due to come into effect in 2026, ensures that the carbon price of imports to the EU is equivalent to the carbon price of domestically produced products. By placing a price on the carbon content of imports, the CBAM is expected to reduce carbon leakage and support EU decarbonisation while potentially incentivising producers outside of the EU to decarbonise and to improve the competitiveness of their products on the EU market, contributing to a reduction in global emissions.

CBAM is expected to affect the Balkan chemical industry because the **European Union** is a key export market for chemical producers, while production in the region is generally more carbon-intensive than in the EU. Although Balkan chemical exports are relatively small in global terms, they are economically significant for the region and heavily oriented toward EU markets.

Serbia's chemical industry emissions are dominated by the petrochemical and fertiliser industries, where energy generation is largely derived from lignite. In Albania, oil refining and bitumen production contribute a high carbon footprint in relation to

industrial output, while Bosnia and Herzegovina's fossil-heavy power grid amplifies the indirect emissions of its energy-intensive sectors.

The direct impact of CBAM on Albania's chemical exports will be limited initially due to the sector's small size. However, as CBAM expands to cover more chemical products, even small-volume exporters like Albania will eventually be affected.

While Bosnia and Herzegovina has developed strategies for just transition in several of its carbon-intensive industries, including energy, steel, and cement, the chemical industry is not yet a primary focus. Transition strategies must prioritise energy efficiency and the integration of renewable sources of energy.

Serbia is better positioned than its neighbours to implement advanced decarbonisation technologies, given its more developed chemical and petrochemical infrastructure and its ongoing efforts to pursue pathways to decarbonise its economy. However, the sector is highly exposed to CBAM due to the volume and carbon intensity of its EU-bound exports due largely to the dominance of coal in national electricity generation mix – 59% in 2023.

The core challenges of decarbonising the chemicals industry include:

- Dependence on fossil carbon as feedstock: This 'embedded carbon' is difficult to substitute with renewable or recycled alternatives at scale
- High-temperature process energy requirements: Electrification, while promising, is only viable for processes needing temperatures of below 150°C, and many require 800-1000°C.
- Capital intensity and long project lifespans: chemical production facilities typically operate for lifespans of 30–50 years. Retrofitting for electric heating, carbon capture, or green hydrogen, demands significant investment and long-term regulatory certainty – as well as potential disruptions to complex supply chains and employment.
- Product and process diversity: The sector produces over 70,000 products with diverse process requirements, making a "one-size-fits-all" decarbonisation strategy unlikely
- Technology readiness and infrastructure: green hydrogen and capture, utilisation, and storage (CCS) are not ready to be integrated into chemical industry at scale.

Globally, there are five main technologies for decarbonising the chemical industry:

- Electrification of heat and processes – replacing fossil combustion for heating with electric boilers, heat pumps, or plasma/electrochemical systems.
- Use of renewable feedstocks – including bio-based inputs (e.g., bioethanol, lignin-derived tonics), CO_2-derived intermediates, and waste plastics as circular carbon sources

- Energy efficiency and digitalisation – process optimisation, waste heat recovery, and AI-based operational controls
- Hydrogen as a fuel and feedstock – replacing fossil hydrogen used in ammonia, methanol, and refinery processes with green hydrogen produced via renewable electrolysis
- Carbon capture, utilisation and storage (CCS) – capturing CO_2 from high-purity streams for reuse or sequestration.

This report is part of a four-part series analysing the impact and opportunities of CBAM for Albania, Bosnia and Herzegovina and Serbia and what this means for their emissions-intensive **electricity, steel, cement,** and **chemicals** sectors. This report explores the impact of the CBAM on the three countries' chemical sectors, and what approaches they can take to decarbonise and mitigate their financial impacts from the introduction of the CBAM.