

# Alteo Gardanne Refinery: 130 Years of Adaptation to Meet the Dual Challenge of Environmental Protection and Added Value

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## Abstract

The Gardanne plant is the cradle of the bauxite-to-alumina refining industry through the Bayer process 130 years ago. All along its industrial and entrepreneurial history, the plant has consistently reinvented itself to meet the structural as conjunctural challenges faced.

The company has been able to modernize its plant and increase its alumina production in line with the growing demand from the Second World War until the 1970s. Then from this period energy costs became a major issue with the oil crises and recently, the consequences of the war in Ukraine. The Gardanne operating configuration has been revisited several times to change its energy supply mix and its energy production and to adapt its process (evaporation and digestion).

With the evolution of regulations and corporate social responsibility (CSR) challenges, taking environmental constraints into account has become an issue of survival. Innovative solutions have been implemented to meet environmental constraints, as water consumption and the wastewater quality, control of dust emissions and atmospheric discharges and particularly on bauxite residue management.

Regarding CO<sub>2</sub> emissions, the site has launched a major - and much-acclaimed – reduction plan for its entire process in 2022, proposing innovative solutions to improve energy efficiency and increase the proportion of electrical energy.

Finally, the Gardanne plant has successfully implemented a new business model for higher value-added specialty alumina, and production facilities have been modernized to produce this alumina. This transformation has been underway for the past two decades and has accelerated with the cessation of bauxite refining in 2021 and the transformation of its Bayer process.

The oldest active alumina plant in the world, Gardanne has 130 years of adaptations.

**Keywords:** Innovation, CO<sub>2</sub> emissions, Bauxite residue management, Value-added specialty alumina.