

China Hongqiao Group –A Journey of Sustainability, Advanced Technology, Research and Development and Innovation

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Abstract



An aluminium journey beginning in 2001 with a small 240 kA potline, China Hongqiao Group (a HK-listed public company, with Weiqiao Pioneering Group as a majority shareholder) today is a leading global aluminium conglomerate.

Upstream and downstream activities have been added in the two decades of aluminium industry development to the situation where China Hongqiao has spread along the full aluminium value chain including around 19 Mt of alumina capacity, an ever-growing production footprint in the downstream/lightweighting sector and including recycling and research & development and innovation.

Within its 6.46 Mt licensed aluminium smelting capacity (under China's nationally approved aluminium production cap of 45 Mt), China Hongqiao operates the most modern energy-efficient fleet of aluminium smelters with an average age of less than 10 years and amperage of 400 kA to 600 kA. Second-generation advanced technology 600 kA potlines are being introduced progressively in Shandong and as part of the capacity relocation to Yunnan Province. Energy consumption is below 12 400 kWh DC per tonne aluminium for these second-generation 600 kA cells.

Aluminium smelting capacity relocation is continuing; this is driving down the coal-based electricity requirements (in Shandong) through the shift to the low carbon electricity grid in Yunnan Province, mainly from hydro power resources.

Our focus has also been on strengthening the application of clean energy electricity from renewables including photovoltaic (PV) and wind. A Weiqiao Pioneering clean energy roadmap across Shandong Province and Yunnan Province comprising up to 13 GW has been established – and the first 2 GW capacity has been grid-connected.

Industrial clusters remain central to the China Hongqiao business model, a feature from the very beginning with the original China Hongqiao Binzhou cluster now a grouping of 150 enterprises benefiting from the operational and commercial synergies. Hot metal delivery is the obvious example for cost-savings to both Hongqiao as producer and our customers, reducing both casthouse requirements and energy consumption. The industrial clusters business model is built on the foundations of strategic partners and close commercial links to customers. The cluster model is also a key advantage incorporated into the new China Hongqiao Yunnan operations.

From 2023, a new Binzhou industrial cluster has been added to the China Hongqiao portfolio through combining aluminium downstream lightweight manufacturing, automotive component manufacturing, the inclusion of the Beijing Automotive Workshop (BAW) vehicle production within Weiqiao Pioneering Group and the establishment of vehicle disassembly and recycling facilities – our strategic partnerships create a one-stop transport/automotive cluster. Vehicle production is aimed at commercial EV transport units, supplying vehicles required to achieve a

modern functional and efficient city, bringing clean EV benefits from frequent use/daily recharging cycles and creating more healthy cities.

China Hongqiao continues to focus on scientific research and technological development in the field of lightweight aluminium applications – and the creation of higher value products. Six new aluminium alloys have been developed and registered during 2023, covering high-strength and corrosion-resistant alloys, anti-fatigue cast aluminium alloys, and die-casting special heat-free treatment material. These new materials have excellent mechanical properties and can be widely used in automotive lightweighting and aluminium processing industries.

With the Weiqiao-UCAS (University of the Chinese Academy of Sciences) Advanced Industrial Research Institute for Future Technology & Engineering, a platform has been built for the integration of science, education, innovation and production, for the seamless integration of industrial innovation and commercial application.

Working with Chinese and international alumina producers and Chinese and international industry groups, China Hongqiao Group is progressing work on the broader utilization of bauxite residue/red mud. In 2024, the Group was able to recover around 4 million tonnes of iron product.

China Hongqiao is committed to achieving the goals set by China of a carbon peak by 2030 and carbon neutralization by 2060. A roadmap has been established for achieving the twin carbon goals. The presentation to be made at ICSOBA October 2025 meeting will include details and results from our 2024 Carbon Reduction Action Report.

Management commitment and the engagement of all stakeholders is required to achieve corporate success and sustainability outcomes: employees, shareholders, commercial partners and customers, academic and research institutions all share this responsibility. It is important to work together and with governments at all levels – national, provincial, city, district – for success to meet the expectations of all parties – a team effort by all players to succeed and win.

Keywords: Efficient aluminium smelters, Sustainable aluminium industry, Technology innovation, Carbon neutrality goal, Management commitment.