

# **Lithium Geopolitical and Socio-Environmental Dynamics – current and future scenarios**

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## **LITHIUM GEOPOLITICAL AND SOCIO-ENVIRONMENTAL DYNAMICS – CURRENT AND FUTURE SCENARIOS**

Lithium is essential to the low carbon technologies necessary for the energy transition because of its applications in energy storage, in particular portable batteries. Its highly concentrated value chains, paired with price volatility and inventory management practices, raised geopolitical concerns, saw the destruction of some demand, and triggered growth in the lithium project pipeline. Likewise, increases in lithium production encouraged debate on the social, environmental, and economic effects and trade-offs of lithium extraction in host provinces. Key lithium producing countries have formulated strategies for their critical minerals sector and cemented geopolitical alliances centred on Critical Raw Materials (CRM). In parallel, battery technologies continue to improve and the potential for sodium ion batteries to displace lithium has fostered discussion and signalled uncertainties. Considering these transformations and uncertainties, what are the future socio-environmental and geopolitical trajectories of lithium value chains? This transdisciplinary paper – integrating socio-environmental analysis, policy and geopolitical analysis, and mineral economics – studies i) the current geopolitical and socio-environmental configuration of key lithium supplies, ii) likely geopolitical and socio-environmental scenarios in the medium and long term, and iii) their implications for lithium producing and consuming countries to play responsible roles in the energy transition. The paper analyses the lithium project pipeline and demand projections, overlaying them with geopolitical alliances and CRM-specific bi-lateral and multilateral initiatives, to formulate medium and long-term geopolitical scenarios. Based on the socio-environmental track record of current and future producers, it identifies likely socio-environmental trends and issues that require attention from producing and consuming countries. It concludes with a reflection on how projected geopolitical and socio-environmental dynamics can interact in future scenarios.