

Towards Educational Decarbonization: A Comparative Analysis from Global Metropolitan Regions for the Greater Bay Area

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Abstract

Carbon neutrality in the education sector is a growing concern within climate governance frameworks worldwide. In less developed countries such as China, the role of the education sector in decarbonization is often underestimated compared to traditionally high-emission industries. As a region aspiring to become a model for green and smart development, the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) has introduced various policies promoting low-carbon schools. Meanwhile, significant barriers—such as the system inconsistency, lack of tailored carbon accounting tools for K-12 institutions, limited engagement and low financial resources allocation—have structurally constrained implementation.

Through a comparative analysis of policies, tools, and arrangements, this study investigates how global metropolitan regions in developed countries—specifically the San Francisco Bay Area and Greater London—have approached carbon accounting and climate action in the education sectors, and accordingly provide insights for the GBA's unique cross-jurisdictional context.

Preliminary findings suggest that institutionalized and accredited support mechanisms (e.g., standardized emissions reporting protocols, curriculum integration, and public-private partnerships) play a critical role in fostering decarbonisation at the school level. Furthermore, efficient data systems and regional networks among schools have enabled collective learning and continuous advancements in cities like London and San Francisco.

The value of these cases have been underappreciated in developing a regionally adaptable, campus-friendly carbon accounting tool, as well as building a collaborative governance model that bridges the gap among different stakeholders, such as local education bureaus, environmental agencies, and community groups, in the GBA. This paper advances efforts towards urban sustainability by recognizing education not only as a carbon emitter but also as a key platform for fostering climate awareness and sustainable practices.

Keywords: Educational Decarbonization, Carbon Accounting, Climate Governance, Cross-jurisdictional Governance, Climate Action, Environmental Policy