# China Unveils World’s First Carbon Fiber Metro Train



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BEIJING, China, June 29 — CRRC Qingdao Sifang and Qingdao Metro have introduced the world's first commercially operational metro train constructed with carbon fiber materials, named CETROVO 1.0. This development represents a significant step forward in environmentally friendly urban transportation.

The use of carbon fiber composites, known for their excellent strength-to-weight ratio, has enabled an 11% reduction in the train's overall weight compared to traditional metal models. This reduction in weight results in a 7% decrease in energy consumption, leading to an annual decrease of 130 metric tons of carbon emissions, which is comparable to planting approximately 6.7 hectares of forest.

Liu Jinzhu, a senior designer at CRRC Qingdao Sifang, emphasized that despite the train's lighter frame, the carbon fiber construction does not compromise strength, offering superior resistance to impact and fatigue. This design also reduces wear on wheels and rails, minimizing maintenance requirements.

The CETROVO 1.0 integrates advanced digital twin technology through the SmartCare intelligent operation platform. This system allows the train to self-diagnose and detect potential issues, ensuring safe and efficient operation while reducing maintenance costs by 22% over the train’s life cycle.

This innovation underscores the significance of lightweight vehicles in achieving eco-friendly and low-carbon urban rail systems. As highlighted by Lyu Xiaojun, another senior designer at CRRC Qingdao Sifang, the transition to carbon fiber composites marks a pivotal advancement for the industry’s dual carbon goals and the green transformation of urban rail transit.

The train has completed in-factory testing and is scheduled to begin operations in Qingdao later this year.