Carbon Border Adjustment Mechanism and the Role of Clean Tech: A Case for Nanotechnology in Trade Decarbonization

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Edita Kala is a Sustainability and Carbon Accounting Analyst at Intersnack Group, where she is responsible for Scope 3 greenhouse gas emissions reporting across the company's value chain. Her work focuses on the quantification of indirect carbon emissions, the identification of strategic decarbonization pathways, and the alignment of corporate climate action with science-based targets (SBTi). Edita holds a Master's degree in Ethics, Economics, Law, and Politics from the University of Bochum. Her interests lie in the intersection of clean energy innovation, equity, and data-driven climate strategy.

As the global push for decarbonization accelerates, the intersection of trade policy and clean technology is becoming increasingly critical. The European Union's Carbon Border Adjustment Mechanism (EU CBAM) represents a landmark policy aimed at preventing carbon leakage and ensuring a level playing field in international trade. Having examined CBAM extensively in my Master's thesis, I intend to approach the topic from a new perspective at this conference—focusing on how carbon policies like CBAM can influence the advancement of nanotechnologies. I will discuss as how these emerging technologies have the potential to become a competitive advantage for major exporting countries, enabling them to meet carbon standards more efficiently and remain resilient in a rapidly evolving global trade landscape.

Nanotechnology presents significant opportunities to reduce carbon intensity in sectors most affected by CBAM, such as steel, aluminum, cement, and fertilizers. From enhancing material performance and durability to enabling energy-efficient manufacturing and storage solutions, nanotech-driven innovations can lower the carbon footprint of traded goods and help industries stay competitive under emerging carbon pricing frameworks. Carbon intensity is no longer treated as a sustainability metric only but also as a trade competitiveness metric. Countries investing in nanotech-driven low-carbon production may gain a competitive advantage in global markets. In this context, instruments like CBAM act as market-shaping forces, driving demand for clean technologies including nanomaterials, energy storage systems, and sustainable energy innovations. Early alignment between industrial policy and climate regulation can accelerate the deployment of nanotech solutions, especially when backed by targeted investments and cross-sector collaboration. Moreover, nanotechnology's role in decarbonization could grow more prominent as verification and lifecycle assessment standards tighten across global supply chains. By linking policy frameworks like CBAM with innovation ecosystems, we can better support a just and technologically robust transition to low-carbon trade.

Nanotech - Green Energy - Role of Women - Young Generation

Nanotechnology holds transformative potential for accelerating breakthroughs in green energy—from enabling high-efficiency energy storage to developing low-emission materials for heavy industry. However, its full impact has yet to be realized, largely due to challenges in scalability and high implementation costs. Addressing these complexities requires not only scientific and technical expertise but also multidisciplinary and diverse thinking. Such innovation thrives when inclusivity is embedded in the system—by empowering more women in science and engineering and supporting the younger generation to lead with creativity, urgency, and purpose. Yet, systemic barriers continue to limit women's participation in STEM fields. Overcoming these barriers is not only a matter of fairness but a strategic necessity. In my view, advancing green energy and scaling nanotech needs all hands on deck and the gender gap slows down these solutions.