

Innovating for Impact: Real-World Lessons in Advancing Sustainable Materials

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Abstract:

The development of safer and more sustainable materials is accelerating in response to growing regulatory requirements, brand and market commitments, consumer preference, and societal pressure. As part of Dow's 2025 Sustainability Goal-Safe Materials for a Sustainable Planet, Dow identified ten sustainable alternatives based on four criteria compared to an incumbent 1) better human and environmental profile, 2) favorable life cycle assessment (LCA) 3) comparable performance, and 4) market acceptance. An evaluation of the journey of those ten sustainable alternatives highlighted several critical lessons learned in bringing safer [and more sustainable] solutions to the market. These case studies revealed a complex landscape: regulatory and consumer drivers alone rarely ensure broad adoption; performance and cost must remain competitive; and market acceptance hinges on early and sustained engagement across the value chain. Even when sustainability benefits are clear, customer reluctance, cost sensitivity, technical complexity, and entrenched manufacturing systems can delay or limit adoption. At the same time, Dow's journey demonstrates how proactive innovation, transparent communication, and deep collaboration can enable greater adoption and position the company as a leader in safer materials. By sharing real-world examples and the challenges encountered along the way, this work aims to offer practitioners and decision-makers a candid view into what it takes to advance safer, sustainable material innovations in practice and how leadership, persistence, and system-level thinking are essential to driving meaningful progress.

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An evaluation of the journey of these 10 alternatives highlighted several critical lessons learned in bringing safer, more sustainable solutions to market. The case studies revealed a complex landscape in which regulatory and consumer drivers alone rarely ensure broad adoption. Performance and cost must remain competitive, and market acceptance depends on early and sustained engagement across the value chain. Even when sustainability benefits are clear, customer reluctance, cost sensitivity, technical complexity and entrenched manufacturing systems can delay or limit adoption.

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communication and deep collaboration can enable greater adoption and help position the company as a leader in safer materials. By sharing real-world examples and challenges encountered along the way, this work offers practitioners and decision-makers a candid view of what it takes to advance safer, sustainable material innovations in practice, and how leadership, persistence and system-level thinking are essential to driving meaningful progress.