

Embracing Tomorrow: Redefining Advanced Materials for a Sustainable future

Introduction

In the not-so-distant future of 2050, humanity stands at the threshold of a new era, one where the principles of sustainability are no longer just lofty ideals but fundamental pillars upon which our society is built. One of the key drivers of this transformation lies in the redefinition of advanced materials. Imagine a world where every product we use, every structure we inhabit, is crafted from materials that not only serve their intended purpose with unparalleled efficiency but also leave behind a positive impact on the environment. This is the vision that drives innovation in the realm of advanced materials – materials that are not just strong, light, or flexible, but materials that are sustainable to their core.

But perhaps even more revolutionary than the materials themselves is the way in which they are produced. In the sustainable society of 2050, traditional manufacturing processes – with their heavy reliance on fossil fuels and wasteful practices – have been replaced by cutting-edge techniques that harness the power of renewable energy and biomimicry. As we journey towards this sustainable future, the redefinition of advanced materials will play a crucial role in shaping the world that awaits us.

From workshop to vision (*where and how*)

This Spring, the AMULET project in collaboration with the AMULET ambassadors, hosted a workshop in Barcelona to gain an insight into experts' visions for the future of advanced materials. Roundtables of experts from the AMULET project and its ambassadors pooled their knowledge and expertise together to create exciting futures based on real industry foresights, results from innovative projects, and some storytelling, imagination and desires.

Workshop participants investigated the specifics of future advanced materials — imagining their appearance, composition, power sources, drivers, and the prevailing policies and societal perceptions surrounding transport and mobility. The objective was to craft a scenario that was not only desirable but also feasible, encapsulating both ambition and achievability.

Broken down into three pivotal steps. The first step prompted participants to consider immediate actions—what could be done in the present? The second step directed attention towards the mid-term, envisioning the pitstop in 2035 and what goals should be achieved by then. Finally, participants explored the third step, in a collective effort, participants envisioned a 2050 scenario, contemplating the urban and natural landscape. The outcome? A well-defined roadmap and stimulating discussions on the intricate details of future advanced materials and policies.

Roadmap to 2050

In envisioning a sustainable future, we embark on a journey guided by strategic goals and bold aspirations. Let's explore the strategic objectives shaping the sustainable landscape of tomorrow.

Picture a bustling metropolis where the rumble of traffic is replaced by the hum of subterranean trains, where hydrogen-powered vehicles glide noiselessly through city streets. By investing in public transport infrastructure, we bridge the divide between urban and rural communities, unlocking opportunities for economic growth.

The materials of tomorrow are not just sustainable—they're regenerative. Prioritising single-material designs streamline recycling efforts, turning waste into a valuable resource. By harnessing the power of bio-materials, we minimise environmental impact while maximising performance and durability. Additionally, local sourcing can reduce reliance on external raw materials, so we enhance supply chain resilience and foster regional economic development. This shift not only reduces environmental impact but also fosters resource efficiency and resilience.

Yet, the journey begins now. The journey towards sustainability begins with innovation. By investing in lightweight and advanced materials, such as recycled plastics and composites, we drive progress, reduce environmental impact, and enhance product performance across industries. Implementation of CO2 regulations and building technological capacity pave the way towards a carbon-neutral future, ensuring a safe and sustainable world for generations to come. In addition, the sharing economy permeates every aspect of our lives from shared cars to holiday houses to energy. Positive regulations incentivise companies to prioritise sustainability, driving innovation and fostering a culture of environmental responsibility. We accelerate progress towards shared sustainability goals by expanding engagement to other continents and fostering global cooperation.

In the crucible of innovation, the future of advanced materials isn't just about progress—it's about promise to the environment and society. In the tapestry of 2050, sustainability isn't just a goal—it's a shared vision for a brighter, greener future. As we set our horizons towards tomorrow, let us embrace the power of collaboration, innovation, and collective action. The journey begins with a single step, and every action we take today shapes the world of tomorrow.

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