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## **Enabling Sustainable Automotive Manufacturing through Cloud and Agentic AI Integration**

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The automotive industry is undergoing a transformative shift toward sustainability, driven by increasing environmental regulations, consumer demand for greener products, and global efforts to achieve net-zero emissions. This research explores how the integration of cloud computing and agentic Artificial Intelligence (AI) can significantly advance sustainable manufacturing practices in the automotive sector. Agentic AI—defined by its autonomous decision-making capabilities—enables real-time optimization of production processes, energy usage, and resource allocation, while cloud infrastructure ensures scalability, interoperability, and seamless data flow across global operations.

The paper investigates the synergistic role of cloud platforms and intelligent agents in reducing carbon footprints, enhancing supply chain visibility, and enabling predictive maintenance and waste minimization. Through case studies and system architecture analysis, we illustrate how cloud-agentic ecosystems facilitate adaptive, data-driven manufacturing models that respond dynamically to environmental and operational variables. The study concludes with strategic recommendations for automotive manufacturers seeking to embed sustainability at the core of their digital transformation journey.