

## **SEMATECH Emerging technologies: Accelerating Innovations at the Edges**

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As power-performance-cost trade-offs dominate the scaling of logic and memory technologies, a new paradigm is shaping up technology scaling. The future scaling of such technologies is dominated by innovations in functional materials and nanostructures, heterogeneous integration of such materials

and structures on to Si platforms. This approach - which combines More than Moore solutions to More Moore solutions - is the key to achieving overall equivalent scaling, and continued growth. Such innovations which

use novel materials and structures where needed and when needed on a traditional and established Si platform, are easier to realize, cost effective - compared to replacing existing semiconductor technology infrastructure built around Si - and provide a natural segue into a host

of emerging technologies that can be seamlessly fabricated with traditional CMOS flows and function with such devices. Without such approaches, there is little room to continue leading edge technology scaling, especially as a number of key layers in today's chip technologies are approaching atomic scales and require atomic-level process controls. While such control is possible, and is demonstrated, disruptive scaling approaches are needed to overcome the power-performance-cost barriers.