

## **The Promise of Green Nanotechnology: Better Products, Less Waste and Greater Economic Opportunity**

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### **ABSTRACT**

While much has been made of the potential risks of nanotechnology to human health and the environment, it is far more likely that the ultimate result of investment in nanoscale science and technology research will be vastly improved medical technology; significantly reduced environmental footprint per unit of economic output; and expanded opportunities for innovation, creativity and economic opportunity throughout the world. Indeed, these same contributions have already been delivered by advances in semiconductor electronics - the largest single category of nanotechnology, with the vast majority of worldwide semiconductor production at or below the 90nm node, which brought integrated circuits into the nanoscale 10 years ago.

We believe the next large-scale impact opportunities for nanotechnology lie in the combination of nanoscale chemical strategies with the principles of green chemistry to enable high-volume, high-volume, low-cost, low-waste production and application of nanostructured materials to solid-state lighting, flexible displays, renewable energy generation and storage, water resource optimization, specialty chemicals, precision agriculture, medicine and consumer products. This “green nano” combination is critical for addressing both economic (material yield, production rate, product quality) and environmental (waste, inherent safety, exposure) issues, but deep collaboration among scientists, engineers, entrepreneurs and global industry will be required in order for it to be fully achieved.

At ONAMI we have been building a research and commercialization ‘ecosystem’ that joins researchers, university-based open facilities, technology entrepreneurs, early stage company funding and industry partners in commercializing nanoscale innovations with large impacts. This presentation will describe this ecosystem, including major thrusts of green nanoscience research, facility resources, and a growing green nanotechnology startup company portfolio enabled by ONAMI’s commercialization gap fund.