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Contribution of nanotechnology and nanomaterials to increased sustainability of industrial products and processes

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An overview is presented of some of the opportunities for nanotechnology in real-world industrial applications. A wide range of industries and manufacturing processes are already being or are likely to be impacted by current advances in nanotechnology and nanomaterials. Significant improvements in energy and resource efficiency could potentially be achieved by the implementation of nanotechnology in industrial settings. Developments in nanomaterials can be expected to reduce energy and raw materials consumption and emissions through cleaner, less wasteful production methods. This should ultimately assist in the creation of greener manufacturing processes and a low carbon economy. Examples are given illustrating the advantages of nanomaterials in diverse industrial sectors such as electronics, aerospace, construction, energy, water, catalysts and forest products. The essential role of life-cycle analysis in evaluating the sustainability of nanotechnology enabled products and risk assessment for identifying the health and environmental effects of nanomaterials is discussed.

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