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Perspective on the Practical Limits and Roadmap for Nanostructured Photovoltaics RICHARD R. LUNT, Michigan State University, VLADIMIR BULOVIC, Massachusetts Institute of Technology — The practical efficiency limits for nanostructured photovoltaics including organic small molecule, dye-sensitized, polymer, and colloidal-quantum-dot architectures are assessed *a posterori*. Five decades since Shockley and Queisser derived the theoretical power conversion efficiency limit of single-junction photovoltaic cells, researchers have still not demonstrated such high performance for any photovoltaic device system. Hence, in evaluating the achievable performance of a comparatively new photovoltaic technologies, such as nanostructured PVs, it is prudent to estimate the upper limit of achievable efficiencies based on trends of the best technical demonstrations across the nanostructured platforms. This analysis is utilized to give a clear perspective on the potential market viability of these technologies in the near future and outline the challenges necessary to overcome this threshold. These technologies are compared and contrasted to provide an overview for the potential of each for reducing thermal losses with "Third Generation" concepts accessible to nanostructured PVs that can subsequently impact cost structures.

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