ABSTRACT. In this paper, we study the boundary behaviors of compact manifolds with nonnegative scalar curvature and nonempty boundary. Using a general version of Positive Mass Theorem of Schoen-Yau and Witten, we prove the following theorem: For any compact manifold with boundary and nonnegative scalar curvature, if it is spin and its boundary can be isometrically embedded into Euclidean space as a strictly convex hypersurface, then the integral of mean curvature of the boundary of the manifold cannot be greater than the integral of mean curvature of the embedded image as a hypersurface in Euclidean space. Moreover, equality holds if and only if the manifold is isometric with a domain in the Euclidean space. Conversely, under the assumption that the theorem is true, then one can prove the ADM mass of an asymptotically flat manifold is nonnegative, which is part of the Positive Mass Theorem.