

## **Social Barriers to Renewable Energy.**

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The future contribution of renewable energy to the global energy mix will depend upon overcoming two types of barriers: technical and societal. Technical barriers are widely appreciated and the subject of on-going and planned research within the physical and engineering sciences. Social barriers are less well recognized but can be more complex and resistant to resolution. Moreover, because they are in most instances comparatively ignored, they have the potential to become equivalent or even more significant than technical barriers in achieving future goals for the contribution we expect from renewable energy. One may find examples of such obstacles throughout the portfolio of renewable energy resources. Hydropower offers the best-known examples, particularly the forced migration of populations, such as those associated with the Three Gorges Dam. Less well known are the high consumptive water losses of each unit of electricity from extensive reservoirs. Barriers to geothermal energy development are best known from California projects at The Geysers and in the Imperial Valley. Hydrogen sulfide odors threatened the economic viability of resort communities downwind in Lake County and prompted political pressure to remove these odors or discontinue operations. In the Imperial Valley the primary concern was the impact of geothermal development within the lands of the established and lucrative agricultural operations there. Public opposition to wind development is taking several forms—including visual aesthetics, opposition to changes in existing land tenure, and threats to birds and bats. Solar energy has been attracting negative attention on many grounds, including home owners' associations, land use, threats to endangered species, and consumptive water use. Biofuels—lately the subject of substantial government encouragements—is least well understood, but appears to be moving in the direction of opposition based on competition with food production. Unless these and other social barriers are addressed, renewable energy will not soon reach its potential. **Keywords: renewable energy, solar, wind, geothermal, society**

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