Energy efficiency improvements have become a major hope for decoupling the energy demand from economic growth and for achieving environmental goals. Nevertheless, effectiveness of policies based on promoting energy efficiency may be undermined by behavioral responses. More efficiently produced energy service becomes cheaper and economic theory then suggests that consumers should demand more of it, which will cause a loss of the potential technological saving. The phenomenon is called the rebound effect and it has become a focus of energy economists since early 80s. However, even today there is no clear consensus on its importance. Quantification of the rebound effect is mainly hampered by poor data availability and the comparison of results is not straightforward due to methodological differences. Our thesis concentrates right on the economic theory of the demand for energy services, definitions and methodology of its estimation. It provides a comprehensive overview of what was done in the domain and suggests which methodological approaches correspond the most to the economic theory.