The objective of this paper is to provide a more detailed picture of potential biomass energy production in the Chinese energy system towards 2030 and 2050. Biomass for bioenergy feedstocks comes from five sources, which are agricultural crop residues, forest residues and industrial wood waste, energy crops and woody crops, animal manure, and municipal solid waste. The potential biomass production is predicted based on the resource availability. In the process of identifying biomass resources production, assumptions are made regarding arable land, marginal land, crops yields, forest growth rate, and meat consumption and waste production. Four scenarios were designed to describe the potential biomass energy production to elaborate the role of biomass energy in the Chinese energy system in 2030. The assessment shows that under certain restrictions on land availability, the maximum potential biomass energy productions are estimated to be 18,833 and 24,901 PJ in 2030 and 2050.