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Following agricultural technological heterogeneity, we employ the meta-frontier DEA method to measure agricultural energy efficiency in China's agricultural sector, and then use Malmquist index approach to explore the energy productivity change. The results show that agricultural energy efficiency is quite low and has the characteristics of regional differences. The energy efficiency of eastern coastal regions is significantly higher than that of the western interior. The energy efficiency loss comes mainly from managerial inefficiency rather than technology gap on the whole. The Malmquist index reveals that agricultural energy productivity has improved in general, mainly due to technological advancements while the deterioration in agricultural energy productivity is due to reduction in technical efficiency. We suggest that technological innovation and managerial efficiency should be promoted to increase energy efficiency and more attention should be paid to the western region to balance the regional difference. The findings are of great significance to energy conservation and sustainable development in China's agricultural sector.

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