2nd generation biofuels a sure bet? How to get it wrong

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Biofuels were expected to be a major step forward in the endeavour to reduce transport-related emissions of greenhouse gases. Then life cycle thinking led to formal evaluations of the energy balance of such fuels, and the corn-ethanol debate was vigorously conducted. Just as consensus was building on how to conduct such evaluations and on the likelihood that the energy and greenhouse gas balances of North American fuel ethanol were marginally favourable, came the carbon debt insights, a result of applying consequential LCA backed by advanced economic modelling. Increasingly, hopes have shifted to the 2nd generation biofuels, viewed as a technological home run. Could this also backfire? We show a simple case in which there would be no improvements in greenhouse gas emissions: a sugar mill sells its bagasse, currently used at low efficiency to provide process heat, to an advanced biofuels producer, and buys an equivalent amount of coal without investing in efficiency improvements. How could this be prevented?