# An integrated strategy for catalytic production of biofuels (butene oligomers) and biochemicals (1,4-pentnaediol) from corn stover using gamma-valerolactone

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An integrated strategy for the catalytic production of biofuels (butene oligomers) and biochemical (1,4-pentanediol) from lignocellulosic biomass was developed in this study. This strategy focuses on development of plant-scale processes that consist of catalytic conversion subsystems for providing high yields of biomass as well as separation subsystems for achieving their high purities and recoveries. A heat exchanger network is designed to reduce the process heat requirements satisfied by combustion of solid biomass residues, while the remaining solid and gaseous biomass residues can be used for meeting the process electricity requirements. This study examines three possible process designs (A: selling extra electricity generated to offsite, design B: selling extra electricity and selling alkanes to offsite, and C: selling solid and gaseous biomass residues to offsite and purchasing electricity from offsite). An economic analysis shows that the minimum selling prices of 1,4-pentanediol for all the processes (A: $1.41/ kg, B: $1.35/kg, and C: $1.25/kg) can be competitive with the commercial market price.