257a Ethanol as Transportation Fuel - Production Technology Developments

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As the World increases its commitment to renewable energy, the production of motor fuel grade ethanol (MFGE) is growing at a rapid pace. MFGE producers in the USA, the world's most voracious consumer of liquid energy sources, ferment approximately 10% of the corn crop yet provide only about 2% of the liquid transportation fuel. To deliver the anticipated quantity of MFGE, it will be necessary, within the next decade, to commercialize technologies for conversion of lignocellulosic feedstocks to MFGE. Production technologies for the available sugar and starch feedstocks have become highly efficient and economically effective. Further, they have become strongly positive in net energy balance. Additional commercially viable technologies will be required for economically efficient conversion of lignocellulosic biomass to MFGE. These necessary “first generation” technologies have been demonstrated in the laboratory and at pilot scale. Some critical technologies have already been adopted by the starch conversion industry and are well developed on a commercial scale. Other critical technologies have been employed by and proven in the pulping and furfural industries. Of particular importance are technologies that complement feedstock gasification. This includes both fermentation and synthesis routes. Additionally, combined ethanol and electric power production facilities are a synergistic combination when properly balanced with gasification facilities. The status of selected current and future technologies of commercial interest to the MFGE industry will be examined.