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Comparison of scientific studies related to biomass conversion in Europe and Turkey

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Energy demand is systematically increasing in almost all over the world based on the increase in population and technological development. Energy can be supplied mainly from fossil fuels (coal, oil, natural gas, etc.) and renewable resources (solar, wind, water/hydropower, biomass, etc.). Fossil fuels are heterogeneously distributed on earth, have limited reserves, and environmentally problems due to unwanted emissions to natural resources (air, water, soil, etc.). Renewable energy sources are renewable, reliable, environmental friendly, and sustainable; therefore, they are one of the best solutions to get rid of these problems of fossil fuels. Biomass is an important renewable energy source in all over the world used directly as combustion material or biofuel produced from conversion of biomass by means of modern technologies. Biomass energy or bioenergy studies have attracted attention to reduce fossil fuel consumption and emissions, as a result, global warming and climate change. In this study, after giving basic knowledge on biomass and its properties in addition to biomass conversion technologies, it is aimed to compare scientific studies relate to biomass conversion in Europe and Turkey. Firstly, the processes of biochemical (anaerobic digestion) and thermochemical (pyrolysis and gasification) technologies commonly used in the conversion of biomass to biofuels or useful chemicals, factors or parameters affecting these processes, and technologies used in these processes are explained. Then, scientific studies conducted in Europe and Turkey by using these conversion technologies of biomass are compared. For this purpose, the studies on biochemical and thermochemical conversion of biomass in Turkey are compared, in respect to the applied technologies and parameters, with the studies on biochemical in Germany and thermochemical in the Netherlands. The results of this review study show that, in general, the studies on biomass conversion in European countries has started earlier than that of Turkey, more modern technologies are applied in Europe because of more research funds to these studies, and based on that, more studies with more parameters with comprehensive values and more sensitive analyses are conducted in in European Countries compared to Turkey.

Biography

Hasan Merdun is currently serving as a faculty member at the Department of Environmental Engineering, Akdeniz University in Turkey. He got his undergraduate degree in Agricultural Engineering in Turkey. He got his MSc degree at Agricultural Engineering Department and PhD degree at Crop and Soil Environmental Sciences in Clemson University, USA, on the subjects of soil and water resources. After getting his PhD degree, he started working at the university as an academician. Around five years ago, he shifted his research interests from soil and water resources to bioenergy production through thermochemical processes / technologies, specifically fast pyrolysis and gasification. He worked with the Catalytic Processes and Materials Group as a post-doctoral researcher at the University of Twente, Netherlands, during June 4 - September 20, 2013. He studied the effects of different catalysts on the yield and quality of bio-oil and gas mixture produced by fast pyrolysis process. His research mission is to add value to the national and global bioenergy sector by applying an integrated biorefinery approach for the development of renewable energy technologies.

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