A review of recent developments related to the use of dimethyl ether (DME) in engines is presented. Research work discussed is in the areas of engine performance and emissions, fuel injection systems, spray and ignition delay, and detailed chemical kinetic modeling. DME's properties and safety aspects are discussed. A simplified theoretical explanation of the emissions behavior of DME is presented. A discussion is presented proposing DME as a significant factor in the future international energy picture. Due to its beneficial combustion properties, possibility of production from a variety of sources, and usefulness as a chemical feedstock, DME can be used in a variety of applications in addition to transportation.