Characteristics of Potential Fuel Cell Fuels

	Production	Storage	Cost est./ gal. eq	Safety	Distribution Infrastructure	Environmental Attributes
RFG	Large existing production operation Uses imported feedstock No energy security or trade balance benefits	Conventional storage tanks	$.05-.15 more than gasoline	Low flashpoint Narrow flammability limits Potentially carcinogenic when inhaled	Existing infrastructure and distribution system	Reduction in greenhouse gases Much lower reactive hydrocarbon and sulfur oxide emissions than gasoline
M 100	Abundant domestic/imported natural gas feedstock Can be manufactured renewably from domestic biomass - not currently being done	Requires special storage because fuel can be corrosive to rubber, plastic and some metals	$.90	Toxic and can be absorbed through the skin No visible flame Adequate training required to operate safely	Infrastructure needs to be expanded	High greenhouse gas emissions when manufactured from coal Zero emissions when made renewably
E 100	Made from domestic renewable resources: corn, wood, rice, straw, waste, switchgrass. Many technologies still experimental Production from feedstocks are energy intensive	Requires special storage because fuel can be corrosive to rubber, plastic and some metals	$1.10-$1.15	Wide flammability limit Adequate training required to operate safely Less toxic than methanol and gasoline	Nearly no infrastructure currently available Food/fuel competition at high productions levels	Zero carbon dioxide emissions as a fuel Significant emissions in production
H_2	Domestic manufacturing: Steam reforming of coal, natural gas or methane Renewable solar	Compressed gas cylinders Cryogenic fuel tanks Metal hydrides Carbon nanofibers Currently storage systems are heavy and bulky	$.79-$1.91	Low flammability limit Disperses quickly when released Nearly invisible flame Odorless and colorless Non-toxic Adequate training required to operate safely	Needs new infrastructure	High emissions when manufactured from electrolysis Lower emissions from natural gas Zero emissions when manufactured renewably
CNG	Abundant domestic/imported feedstock Can be made from coal	CNG needs to be compressed during refueling and requires special nozzles to avoid evaporative emissions Stored in compressed gas cylinders	$.85	Low flashpoint Non-carcinogenic Dissipates into the air in open areas High thermal efficiency Adequate training required to operate safely	Limited infrastructure	Non-renewable Possible increase in nitrogen oxide emissions

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