# ON-BOARD PLASMATRON GENERATION OF HYDROGEN-RICH GAS FOR DIESEL AFTERTREATMENT AND OTHER APPLICATIONS

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Plasmatron reformers can provide attractive means for conversion of diesel fuel into hydrogen-rich gas. The hydrogen-rich gas can be used for improved $NO_x$ trap technology and other aftertreatment applications. Plasmatron reformers developed at MIT use a special low-power, low- current electrical discharge to boost partial oxidation conversion of hydrocarbon fuels into hydrogen and carbon monoxide. This reformer technology provides the advantages of:

- Rapid startup and response to transient conditions
- Efficient conversion
- Compact size
- Relaxation or elimination of reformer catalyst requirements
- Capability to process difficult-to-reform fuels.

Diesel plasmatron reformer technology can provide substantial throughputs with homogeneous reforming. The use of the special plasma facilitates robust, non-catalytic conversion of diesel fuel into hydrogen-rich gas with hydrogen yields that are sufficient for $NO_x$ trap regeneration applications. Higher yields can be obtained with the use of a catalyst.

Plasmatron reformers could also be used for manufacturing of ethene, which could be useful as a selective reducing agent. In addition, plasmatron reformer technology can be used for converting a range of biofuels into hydrogen-rich gas. These fuels include various oils. This capability may improve the prospects for use of renewable fuels in a variety of vehicular applications. The status of plasmatron diesel-fuel reformers will be discussed.