

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ**

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## 2. PLASMA GASIFICATION

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Some types of gasification use plasma technology, which generates intense heat to initiate and supplement the gasification reactions. Plasma gasification or plasma-assisted gasification can be used to convert carbon-containing materials to synthesis gas that can be used to generate power and other useful products, such as transportation fuels. In an effort to reduce both the economic and environmental costs of managing municipal solid waste, (which includes construction and demolition wastes) a number of cities are working with plasma gasification companies to send their wastes to these facilities. Plasma Gasification. Inside the gasifier, the hot gases from the plasma torch or arc contact the feedstock, such as municipal solid waste, auto shredder wastes, medical waste, biomass or hazardous waste,

heating it to more than 3,000 degrees Fahrenheit. This extreme heat maintains the gasification reactions, which break apart the chemical bonds of the feedstock and converts them to a synthesis gas (syngas). The syngas can also be sent to gas turbines or reciprocating engines to produce electricity, or combusted to produce steam for a steam turbine-generator. Because the feedstocks reacting within the gasifier are converted into their basic elements, even hazardous waste becomes a useful syngas. Inorganic materials in the feedstock are melted and fused into a glassy-like slag, which is nonhazardous and can be used in a variety of applications, such as roadbed construction and roofing materials. There are currently plasma gasification plants operating in Japan, Canada and India. For example, a facility in Utashinai, Japan has been in commercial operation since 2001, gasifying municipal solid waste and auto shredder waste to produce electricity. There are a number of proposed plasma gasification plants in the United States.

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