



Fact Sheet

Defense Advanced Research Projects Agency

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IMMEDIATE RELEASE

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MOBILE INTEGRATED SUSTAINABLE ENERGY RECOVERY (MISER) PROGRAM

The Defense Advanced Research Projects Agency (DARPA) Mobile Integrated Sustainable Energy Recovery (MISER) program has two thrusts. The first will develop technologies to harness the energy content of packaging waste generated during military field operations and convert it to electricity. The second is aimed at developing plastic packaging technologies made from renewable sources using processes that do not require hazardous chemicals or generate toxic waste streams.

These capabilities would reduce military logistics burdens by providing fuel for on-site power generation while disposing of waste. Ultimately, MISER technology may be able to replace much of the fuel needs for electrical power in the field, a huge cost savings. Using packaging materials produced with environmentally sustainable methods would provide an additional benefit.

U.S. military land-based operations of the future are intended to be self-sustaining, with minimal logistics tails. When engaged in stationary field operations, units generate solid waste in the form of packaging materials for military meals-ready-to-eat and shrink-wrap for computers, tanks and vehicles. Personnel, fuel, and critical transport equipment are needed to remove and dispose of this packaging waste. The technology being developed is intended to cut down on waste removal and instead use it productively.

Plastic packaging waste has an energy content that approaches that of diesel fuel. Diesel fuel has a heating value of 43.9 mega joules per kilogram and hydrogen content of 12.5 percent. Plastic heating values can range from 26 to 43 mega joules per kilogram with a hydrogen content of five to 14 percent.

If the energy content of the waste is optimized for secondary use as a fuel source, at today's level of packaging being discarded, a military unit could achieve well over 100 percent self-sufficiency for its generator fuel needs. This will save the military millions of gallons of costly diesel fuel, and significantly reduce the logistics tail needed to deliver fuel to deployed forces.

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A number of contractors have received support for the initial 18-month phase of the MISER program.

Two companies are focused on the MISER program's first thrust. A key challenge for these performers is to preserve 70 to 90 percent of the energy content of the waste. Present technologies lose over 50 percent of the energy content on the conversion process or as waste heat. In addition, the technologies must prove practical for military use and be developed in a timely manner. CellTech Power (Westborough, Mass.) is developing technologies to convert packaging waste to power utilizing carbon fuel cell technology. General Atomics (San Diego, Calif.) will use supercritical water to reform packaging into fuel for a generator.

In the second thrust, Polytechnic University (Brooklyn, N.Y.) and DNA 2.0 (Los Altos, Calif.) will use a novel enzyme catalyst approach to make a high-value bioplastic for military packaging applications. The carbon to make the new plastics is from plant oils, such as corn, sunflower and soybean. The resulting bioplastic is expected to have properties matching that of petroleum-based polyethylene, but, unlike polyethylene, this new polymer is designed to degrade in such a way that it can have a secondary use as a military logistic fuel.

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