New Recycling Process Reclaims More Usable Materials from End-of-Life Vehicles

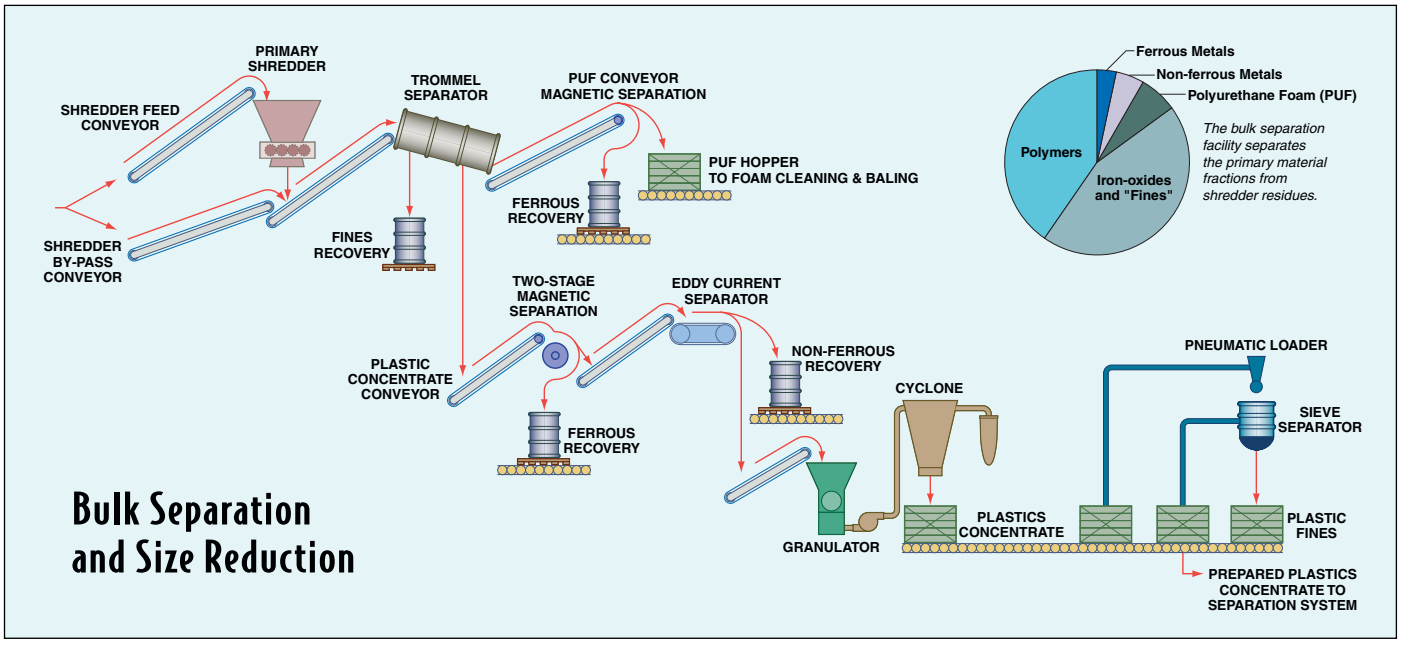
Americans scrap about fifteen million cars and trucks each year. The good news is that today, approximately 75% of the material from those vehicles is recycled; the bad news is that the remaining 25% is not.

Most end-of-life vehicles (ELVs) begin their journey at vehicle dismantling facilities that recover usable parts for resale or remanufacture. From there, the remaining hulk goes to a shredding facility for separation into ferrous (iron-containing) and non-ferrous metals, both of which are recycled. The remaining non-metallic scrap, known as *shredder residue*, goes to landfills. This shredder residue typically consists of a mix of materials: polyurethane foams, polymers, a "fines" fraction that includes metal oxides, glass and dirt, and small amounts of ferrous and non-ferrous metals. For each ton of metal recovered by a shredding facility, roughly 500 pounds of shredder residue are produced—that's a lot of potentially reusable material going to waste!

The beauty of the current system is that it's self-supporting, with those doing the recovery work profiting from the value of the components and materials recovered. Yet, as vehicles become smaller and lighter in an effort to improve fuel economy, they incorporate increasing amounts of lightweight and non-metallic materials. Long-term, this will result in (a) an increased percentage of shredder residue being produced in the U.S., and (b) reduced profits for those recovering metallic scrap, unless they find ways to profit from non-metallic scrap recovery.

Pilot Facility Demonstrates Sustainable ELV Recycling Techniques

To develop sustainable ELV recycling techniques and reduce the amount of shredder residue going into landfills, the U.S. Department of Energy has structured a Cooperative Research and Development Agreement (CRADA) between Argonne National Laboratory, USCAR's Vehicle Recycling Partnership (a partnership of DaimlerChrysler Corp., Ford Motor Corp., and General Motors Corp.), and the American Plastics Council. This project supports the demonstration of materials recovery technologies in an effort to develop a commercial-scale integrated complete residue recovery system. A pilot recycling facility at Argonne



The Argonne process separates primary material fractions from shredder residue.

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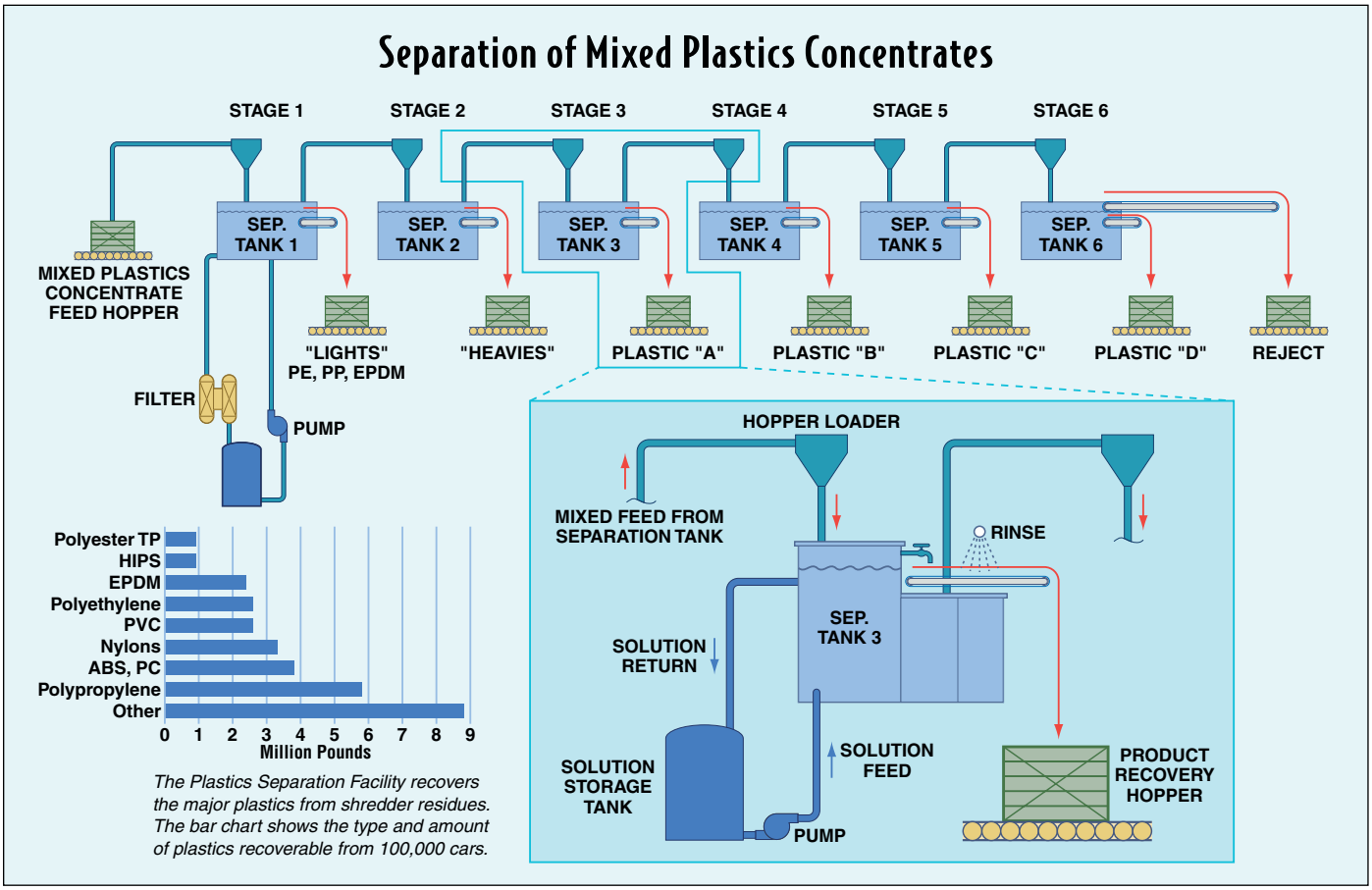

Argonne's plastics separation process yields material that can be used for a wide range of manufacturing purposes.

National Laboratory is demonstrating techniques for recycling these materials for future productive uses.

Two-Stage Process Recovers Usable Materials from Shredder Residue

Argonne's pilot facility incorporates a two-stage separation process that begins with bulk separation of all shredder residue into the following categories:

- Fines (iron oxides, other oxides, glass, and dirt)
- Polyurethane foam
- Polymers (polypropylene, polyethylene, ABS, nylon, PVC, polyester, and the like)
- Ferrous and non-ferrous metals

The pilot facility also houses a plastics separation function that recovers the major plastics from shredder residue. Once separated, raw materials from the Argonne facility will be provided to injection molders and compounders for evaluation and testing, keeping them out of landfills and contributing to the development of lighter weight, more fuel-efficient vehicles.

Materials recovered from ELVs can be used to manufacture new vehicle parts and other plastic products.

For more information, contact:

Edward J. Daniels
630/252-5279
edaniels@anl.gov

Vehicle Recycling Partnership

American Plastics Council