The surge in patenting activity since 2000 points strongly to the commoditization of e-waste as a source of high value materials, such as rare earth and noble metals.

### Patenting activity

**Number of patent families**

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</table>

### Major technology trends

**Compound annual growth in patent families from 2006-2010**

- **+37%** Recovery of rare earth metals
- **+38%** Recovery of noble metals
- **+57%** Battery dismantling
- **+25%** Recovery of silver
- **+24%** Recovery of platinum
- **+63%** Dealing with hazardous cadmium, mainly from batteries

### Top 5 origins

**Number of patent families per office of first filing since 1980**

- Japan 4703
- China 1,480
- USA 485
- Germany 533
- Rep. of Korea 431

### Regional distribution

**Number of patent families by region of first filing since 1980**

- **Americas**: 737
- **Europe, Africa**: 1,217
- **Asia Pacific**: 6,842

### Top 5 applicants

**Number of patent families filed in at least five territories**

- Panasonic: 19
- Hitachi: 18
- JX Nippon Mining & Metals: 18
- Sumitomo: 16
- Solvay: 13

### Specializations

**By economy type**

- **Developed economies**
  - End products as waste source
  - Plastic recycling
  - Rare earth extraction
- **BRICS and other emerging economies**
  - Specific components as waste source
  - Hazardous materials processing
  - Separation techniques

**Non-ferrous metals extraction**

- Further processing, such as smelting or pulverization

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*Patenting activity is a set of patent filings made in various countries to protect a single invention.*

URL: www.wipo.int/patentscope/en/programs/patent_landscapes/reports