



## TECH 2022S6: Recycling of E-Waste

Recycling in E-Waste is one in a series of reports published as part of NexantECA's 2022 Technoeconomics – Energy & Chemicals (TECH) program.

### Overview

Electronic waste (e-waste) is a major emerging resource that is key for the sustainability of the electronics industry as well as a valuable resource for precious, ferrous, and non-ferrous metals critical for energy transition and decarbonization. Despite this valuable role in the circular economy, over 80 percent of e-waste is improperly disposed of, often in unregulated, informal artisan recycling.

E-waste recycling represents a rapidly growing and lucrative opportunity for investment and partnership, but the technology, costs, industry conditions and drivers straddle the lines between waste management, compliance services, and manufacturing. This report focuses on the IT equipment and consumer electronics segments of e-waste. This is a rapidly growing and expanding formal e-waste recycling sector that combines aspects of data protection services, repair and remanufacturing of electronics, and materials recovery.

### Commercial Technologies

This report covers technology, competitiveness, and processing methods for both the IT Asset Disposition (ITAD) industry that deals directly with whole e-waste processing as well as the variety of e-waste focused materials recovery businesses that offtake scrap materials for refining or second-life use. It also provides key strategic and technical differentiators for major players in ITAD industry to provide a holistic view of competition in the sector. Materials recovery coverage includes e-waste specific plastics recycling, targeted refining techniques, and smelter co-processing technologies.

### Process Economics

Using a combination of primary research and modeling, the report offers a detailed unit cost and profitability model for the processing of representative e-wastes in an ITAD facility covering aspects of testing, disassembly, certification, and materials recovery. The model notably separates fixed labor costs from itemized task labor costs that, in addition to raw materials, are the major source of variable costs in unit processing. It also analyzes unit profitability and return on capital through the lens of current trends in pricing and contractual conditions that help determine ITAD industry returns in an era of

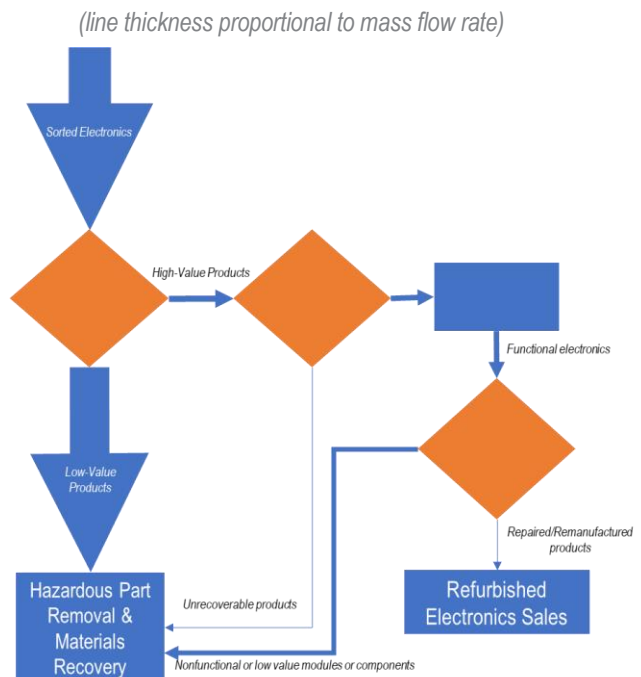
increasing competition. Reflecting the variable nature of ITAD feedstocks and outputs, extensive sensitivities are included.

### Commercial Overview

The report provides a regional overview of the current status of the formal e-waste recycling sector in the Americas, Europe, Asia, Middle East, and Africa, with special focus on countries active in international supply chains. It also provides an extensive analysis of current strategic conditions from the perspective of new market entrants for the ITAD and materials recovery segments of e-waste recycling.

In addition, the report offers a detailed primer on of current regulatory policies, particularly the widely imitated model set by Extended Producer Responsibility (EPR), and international agreements that are of outsize importance determining the pace and direction of continued growth in the sector.

#### Procedural Throughput Flowchart of Commercial ITAD Processing Facility



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**Technology@NexantECA.com or www.NexantECA.com**



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NexantECA serves its clients from over 10 offices located throughout the Americas, Europe, the Middle East, Africa, and Asia.

**Americas**  
Tel: +1 914 609 0300  
44 S Broadway,  
5th Floor White Plains  
NY 10601-4425  
USA

**Europe, Middle East & Africa**  
Tel: +44 20 7950 1600  
110 Cannon Street  
London EC4N 6EU  
United Kingdom

**Asia Pacific**  
Tel: +662 793 4600  
22nd Floor, Rasa Tower I  
555 Phahonyothin Road  
Kwaeng Chatuchak  
Khet Chatuchak  
Bangkok 10900  
Thailand

For more information. please contact  
[Technology@NexantECA.com](mailto:Technology@NexantECA.com) or [www.NexantECA.com](http://www.NexantECA.com)