Recycling Markets and CRT Glass

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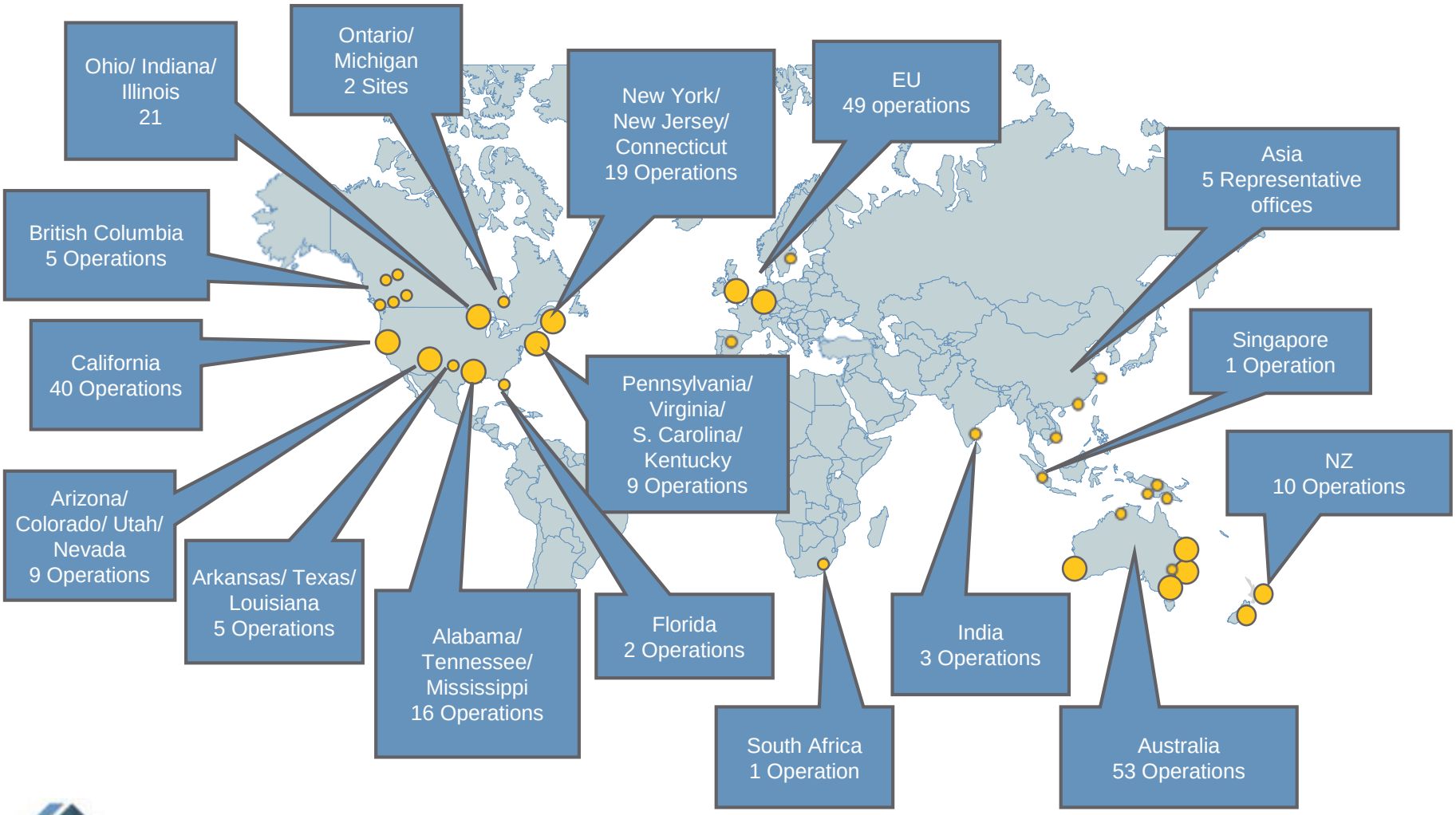
July 17, 2014

Sims Metal Management: 250+ Locations



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Sims Recycling Solutions - Global Overview

- The world's largest electronics recovery and recycling company
- Over 2000 employees, ~600 in US
- 2013 FY production = ~500,000 tons of electronics recycled, >100,000 tons (200 million pounds) in US
- Many facilities "multi-service"
- Circa 2 million individual assets recovered for reuse / year
- Over 15m individual Integrated Circuits recovered
- Exposure to many differing legislative models

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Typical Sims Recycling Facility

- Shipping and Receiving
- Decontamination
- Manual disassembly
- Material reduction processes (e.g. shredders)
- Material separation processes (e.g. magnets, eddy currents, air tables)

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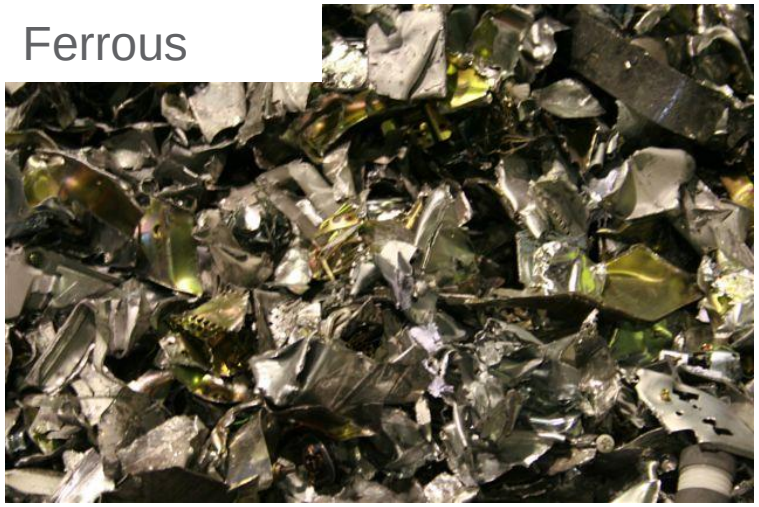
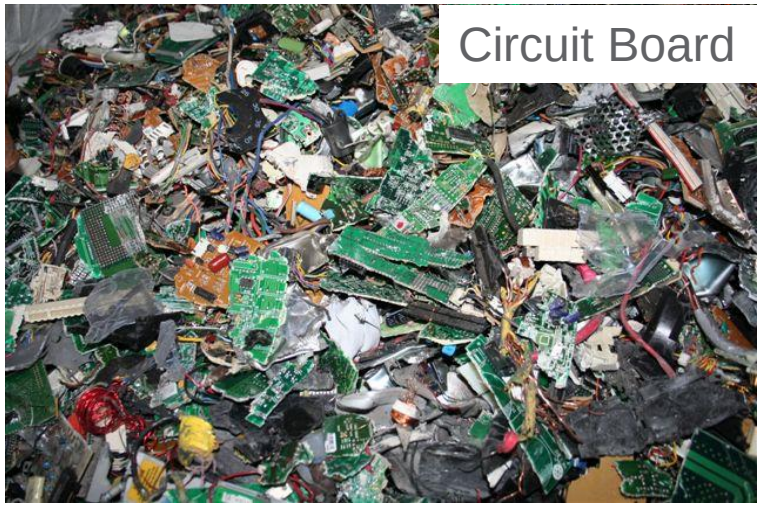
High Volume Output Commodities

Ferrous





Circuit Board

Non-Ferrous

Plastic

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Low value (negative value) material

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Sources of Material

- Factory scrap
  - Volume fluctuate as manufacturing relocates
  - Most manufacturers require assured destruction
- Excess / obsolete inventory
  - Some asset management opportunities
  - Often inventory is very low value
- B2B
  - Assured destruction
  - Asset management
  - Revenue share
- C2B
  - Very low value / high costs
  - State compliance material

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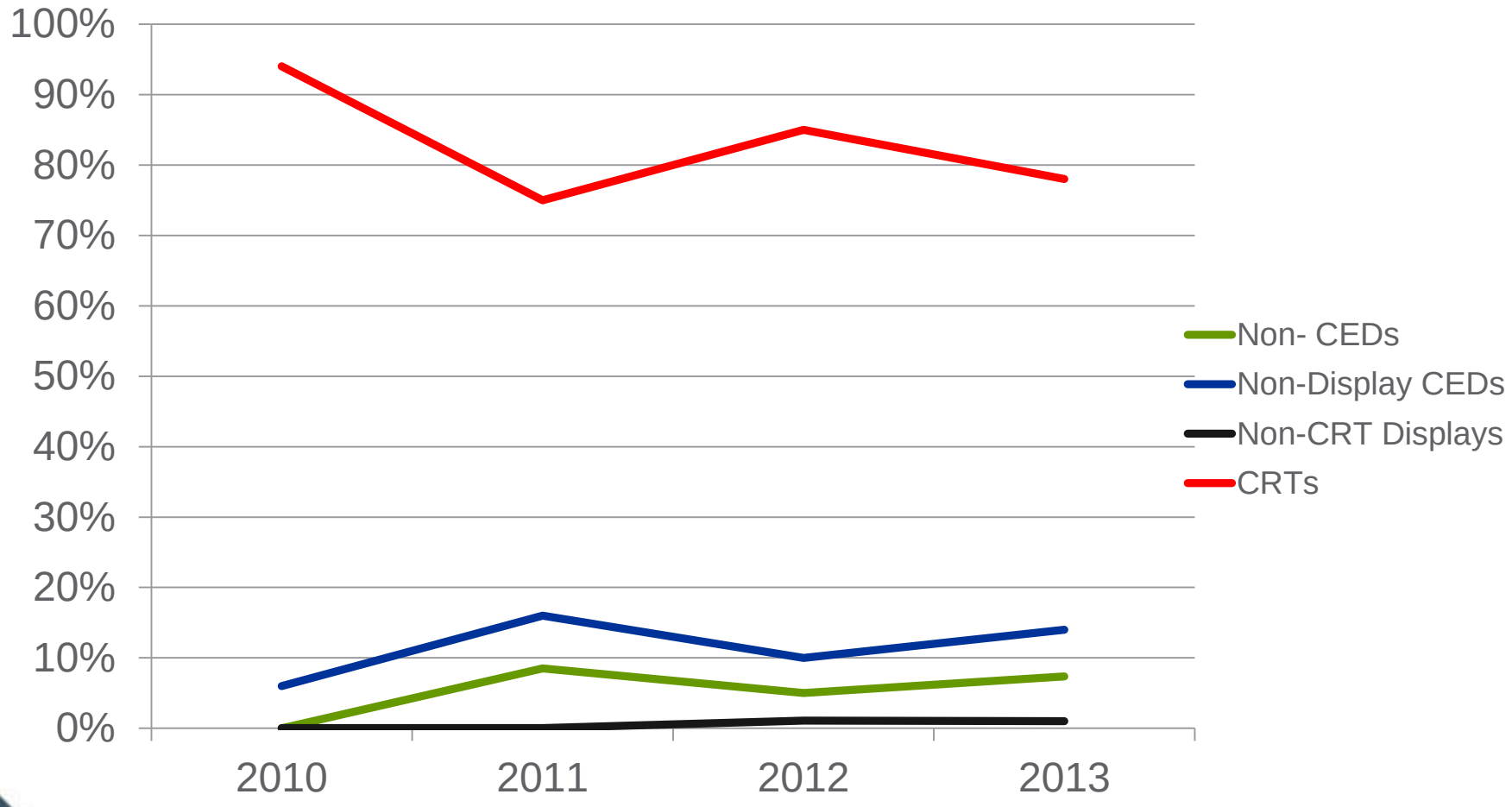
Consumer Material Received



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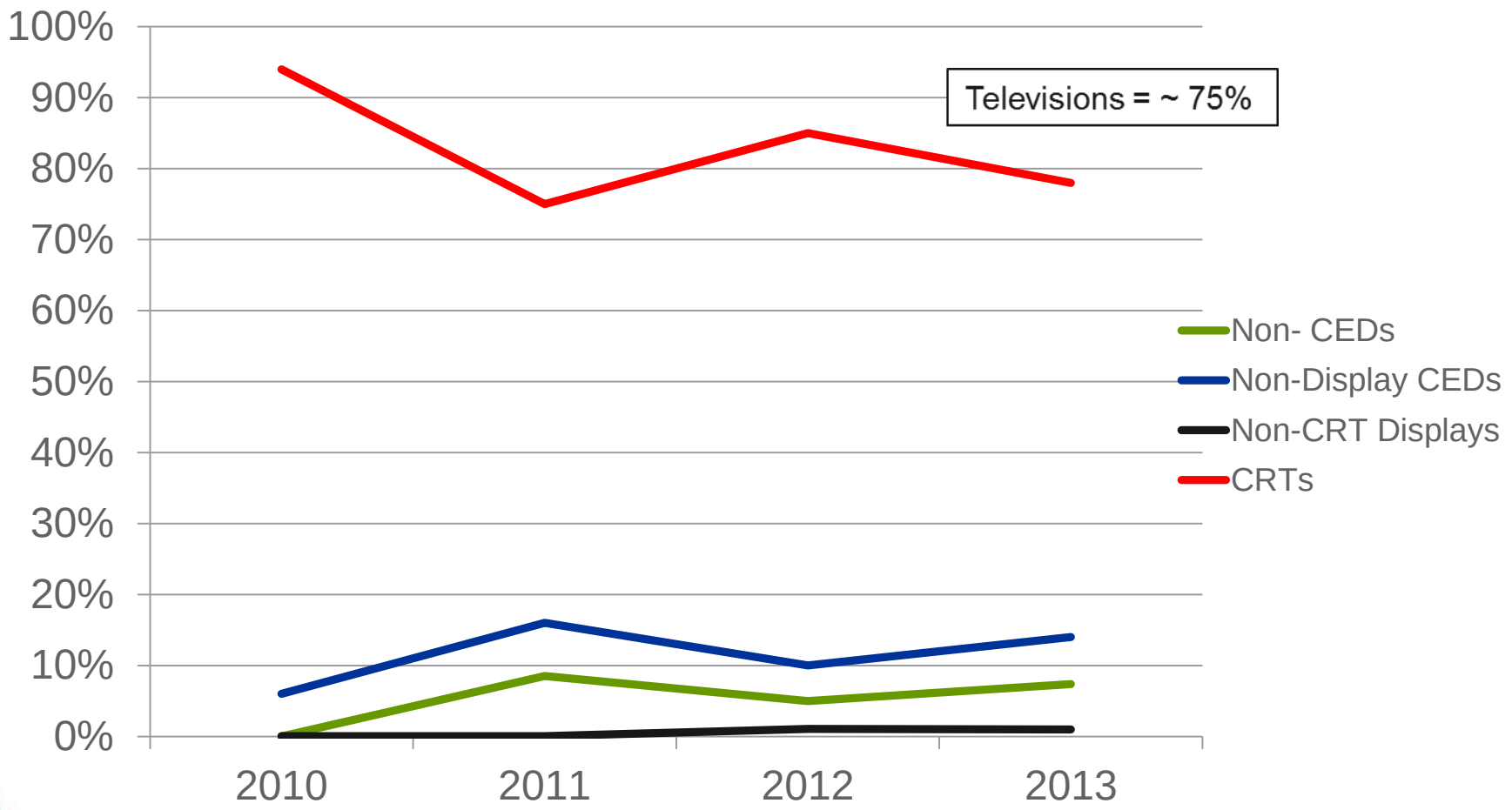
Consumer Material Received



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Economics of Electronics Recycling

- Very simple math:

  Cost of acquisition + separation and preparation of commodity materials + value of commodity materials = profit or loss

- Collection and transportation (acquisition) are often the biggest expenses – the marketplace determines these costs
- Processes can be manual or automated
- High quality processes that protect workers and the environment require high $$ investment
- Commodity values play important role (gold, steel, plastics) and are most volatile of all factors – the marketplace determines value

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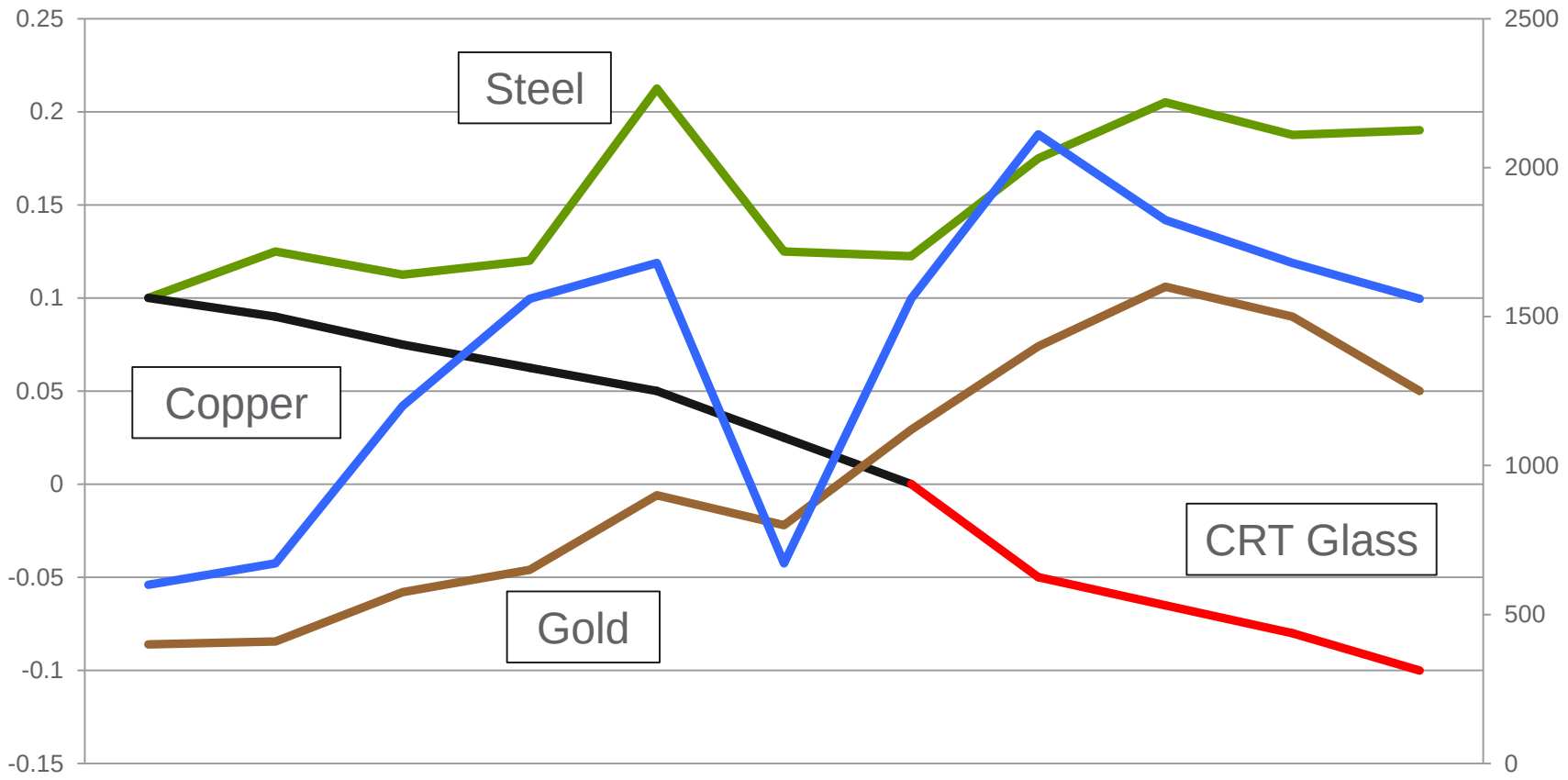
Commodity values over time



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Cost Estimate (per pound)

Cost Element	PC	CRT Monitor	CRT Television
Collection	-.04	-.04	-.04
Transportation	-.05	-.05	-.05
Commodity generation	-.13	-.09	-.09
Commodity value	+.42	-.06	-.08
Avg weight (lbs.)	22	31	70
Total	$4.35 profit	$7.44 loss	$18.20 loss

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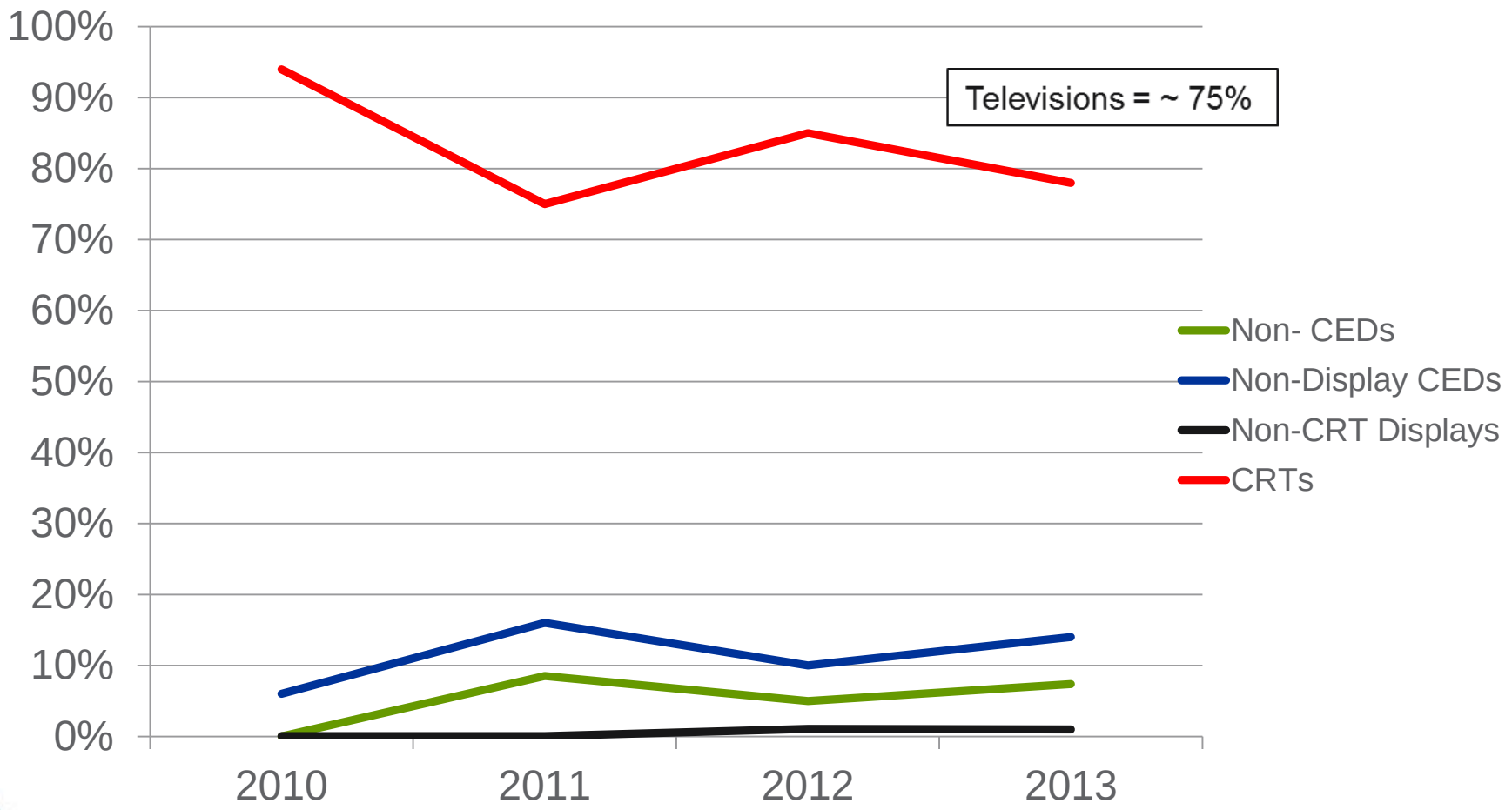
Consumer Material Received



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What CRT Piles Really Look Like

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Glass Transformation

Hand breaking
“Automated” cutting
Shredding

Coating removal
Sorting
Polishing

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Recycling/Disposal Options for CRT Glass

- Glass-to-Glass
  - One manufacturing plant left in world; located in India; long term prospects are limited
- Lead Smelters
  - Requires long distance transportation; limited capacity
- Glass Furnaces
  - Unproven technology; requires large investment
- Landfill
  - May defeat the purpose of producer responsibility law
- Alternate Daily Cover
  - Most states reject as appropriate for their covered products
- Application to Roadbed
  - Not approved in US
- Manufacture of Other Products
  - Requires extensive material prep; often requires export

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Help (and hindrance) in Handling of CRT Glass

- CRT Rule vs. RCRA
  - Exception from hazardous waste rule under certain conditions
  - Makes it easier to manage
  - Needs updating

- Conditional exclusion from RCRA:

  §261.39

  (c) *Processed CRT glass sent to CRT glass making or lead smelting:* Glass from used CRTs that is destined for recycling at a CRT glass manufacturer or a lead smelter after processing is not a solid waste unless it is speculatively accumulated as defined in §261.1(c)(8).

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Handling of CRT Glass

The impact at the state level:

California Universal Waste regulations:

"CRT glass" means any glass released or derived from the treatment or breakage of one or more CRTs or CRT electronic devices that contain CRTs and subsequently reclaimed at a CRT glass manufacturer, or a primary or secondary lead smelter.

Consequence: Can not get paid by the state for the recycling if not sent to lead smelter or CRT glass manufacturer.

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How Much Glass is There?

- 7.2 million tons awaiting eventual disposal – 85% thought to be discarded in next 10 years
- >12 billion pounds in the next decade!?!?!?!?

- Piles of glass are everywhere:
  - August 2012 – 1.2 million pounds in mid-Atlantic
  - September 2013 – 8 million pounds in Arizona
  - February 2014 – 1 million pounds in New Jersey
  - March 2014 – 6 million pounds in Cincinnati

- What is industry capacity?
- What can be done with it?
- What is the cost?
- Who will pay?

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