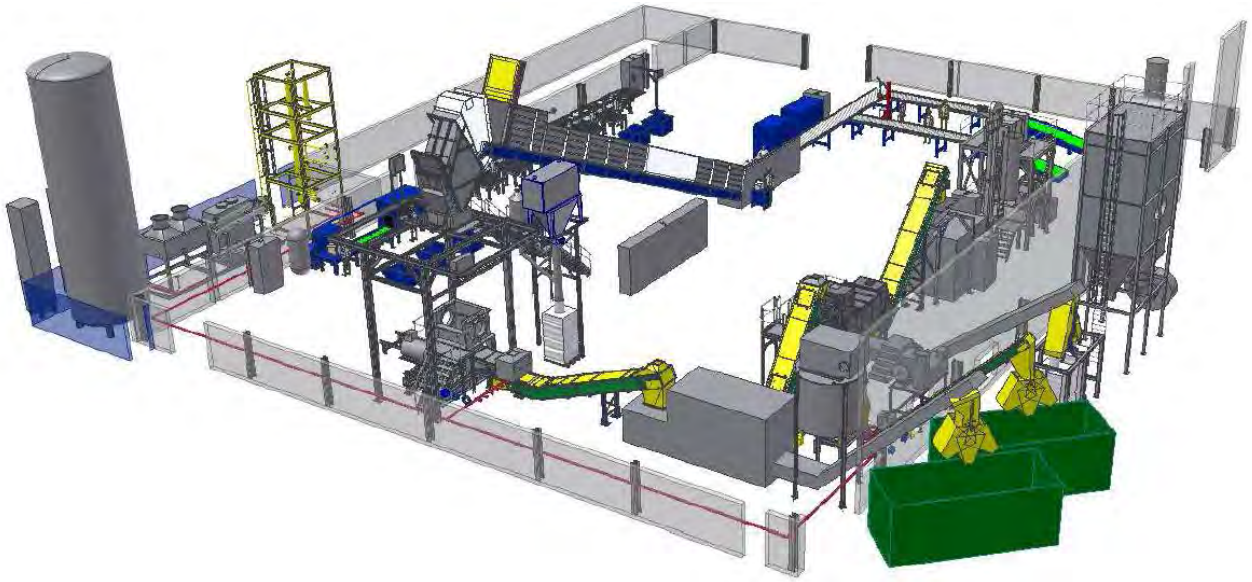
JOBENOMICS™

eCYCLING USA



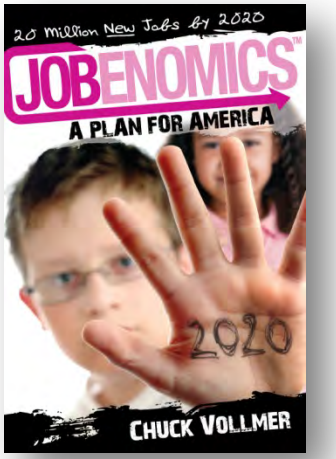
A new approach to urban mining, materials reclamation and business/job creation.

By: Chuck Vollmer

22 May 2015

Core Competencies & Service Offerings

- **Jobenomics:**
  - Strategic planning for business and job creation
  - Urban mining and industry creation
  - Community-Based Business Generator Program
  - Access to decision-makers and opinion-leaders



- **eCyclingUSA:**
  - Education on how to monetize waste streams rather than landfilling or exporting millions of dollars of raw materials.
  - Develop detailed business plans for local decision-makers.
  - Arrange public-private partnerships, joint ventures and financing.
  - Design, engineer and implement turnkey plant within 10 months.
  - Provide interim management team and train local personnel.
  - Warranty equipment and provide after-market support.

Jobenomics and eCyclingUSA works with agencies and entities to use waste stream revenues to create local jobs and businesses.

eCyclingUSA

- eCyclingUSA has exclusive partnership agreements with leading European manufacturers for implementation of locally-owned, turnkey US eWaste Materials Reclamation Centers.
- Of the 3,000 US recycling firms, only 70 shred eWaste, but eCyclingUSA alone provides local communities the ability to shred, granulate, collate and reclaim their locally-generated waste-related raw materials without toxic emissions into the environment.
- Over 100 state-of-the-art European plants are currently operational. eCyclingUSA offers US municipalities entry-level or major Materials Reclamation Centers that will employ up to 200 direct personnel.

Ownership models: Publically-owned, Public-Private Partnership , Privately-Owned (Local, eCyclingUSA, or Joint Venture).

Jobenomics Urban Mining Initiative

Urban Mining Goal: Monetize Urban Waste Streams

C&D
Construction & Demolition Material

MSW
Municipal Solid Waste

eWaste
Electronic Waste & Appliances

Tires
Car, Truck, Rubber Products

Landfill

Sorting Processes
Manual & Automated Operations

Shredding & Collating
Automated Operations

Restore

Common Metals **Plastics** **Precious Metals**

Goal: separate, reclaim and sell high value raw materials.

Types of Reclaimed Raw Materials

Electronic Equipment (WEEE)

Waste Electrical and Electronic Equipment

Copper Plastics Aluminum Iron Gold Silver Palladium

Appliances (CFC)

ChloroFluoroCarbon

Copper Plastics Aluminum Iron

TV/CRTs

Cathode Ray Tubes

Glass Metals Plastics

eCyclingUSA systems are world leaders in raw material reclamation.

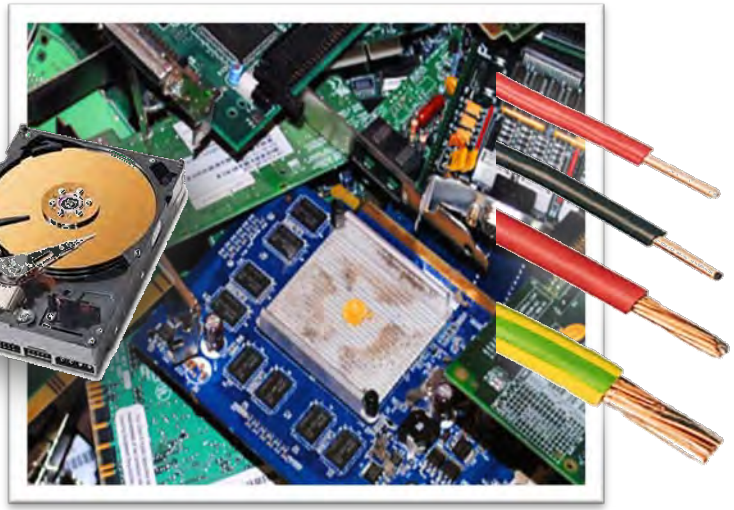
eCyclingUSA Reclamation Processes

eWaste & Appliances

CFC Appliances (Refrigeration)

Televisions & CRTs

Components/Boards/Wiring

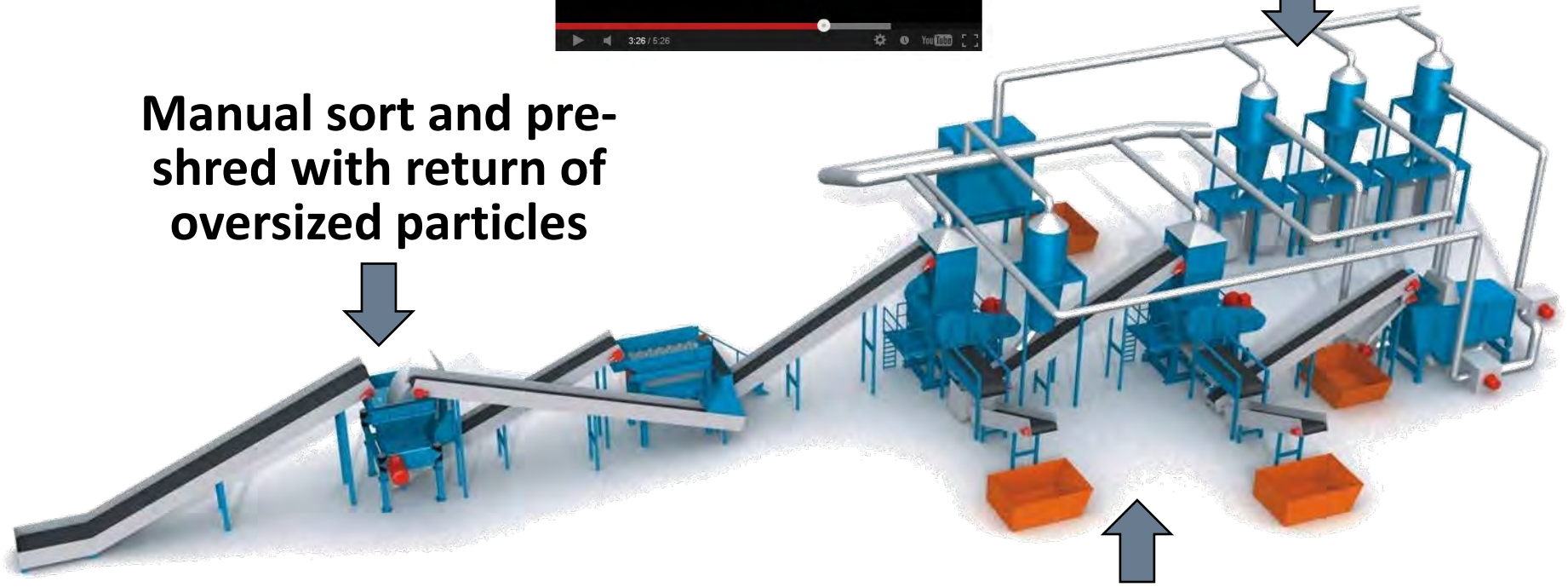


eCyclingUSA uses state-of-the-art materials reclamation technology.

Basic Operation

Purification and environmental protection

Manual sort and pre-shred with return of oversized particles



Granulate, separate, collate, and reclaim raw material by type or color

eWaste is processed in a environmentally closed system.

Value of Reclaimed Materials

- **eWaste Materials** (IT-related, Whiteware, Brownware)
  - Raw materials reclamation:
    - ✓Ferrous: iron, steel ≈ **$350/ton**
    - ✓Nonferrous: copper ≈ **$6,000/ton**, aluminum ≈ **$1,500/ton**, and precious metals ≈ up to **$1,250/ounce**.
    - ✓Plastic (ABS, PE, PV, etc.) ≈ **$150/ton** to **$350/ton**
    - ✓Glass (recycled glass contains 70% of the raw materials in making new glass) ≈ **$10/ton** .
  - Refurbished and resold functioning electronic equipment.
- **Environmental Savings:**
  - Energy 75%, Air Pollution 86%, Water Pollution 76%, Water Use 40%, Mining Waste 97% *(source EPA)*
  - Reduced landfilling and transportation costs.

USA has been slow to recognize the value of materials reclamation but Jobenomics is helping by educating decision-makers.

Typical eWaste Income Streams

eCYCLING USA

Income from Materials				
Material	**$/ton**	**%**		**Total**
Copper	$6,500	10%		$650
Aluminum	$1,500	20%		$300
Iron	$350	20%		$70
Plastic	$250	45%		$113
Glass	$50	5%		$3
		100%		**$1,135**

Tipping Fees				
Type	**$/ton**	**%**		**Total**
Big home appliances	$1,200	15%	80 each @ $15 per item	$180
Cooling appliances	$1,000	15%	80 each @ $15 per item	$150
Computers/Small appliances	$100	10%	100 each @ $1 per item	$10
TV/Monitors/CRTs	$450	10%	150 each @ $3 per item	$45
eScrap	$250	50%	500 each @ $0.5 per item	$125
		100%		**$510**

Total per ton $1,645

Additional income can be derived from high-value items (cell phones, printed circuit boards), grants and carbon credits.

eWaste Revenue & Profit

	Year 1	Year 2	Year 3
10-Ton/Hour without Tipping Fees (3 shift operation)			
Total Revenue	$ 29,156,400	$ 58,118,424	$ 60,443,161
Income (Profit)	$ 11,683,400	$ 24,000,242	$ 24,766,161
EBITDA	40%	41%	41%

5-Ton/Hour without Tipping Fees (3 shift operation)			
Total Revenue	$ 14,578,200	$ 29,059,212	$ 30,221,580
Income (Profit)	$ 5,184,200	$ 11,212,212	$ 11,568,580
EBITDA	36%	39%	38%

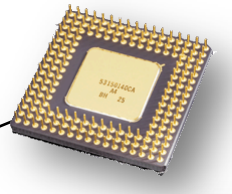
Does not include income from precious metals reclamation, tipping fees, grants, energy/carbon credits, peripheral businesses or commodities-based industries.

Printed Circuit Boards & Components

Mother Board (Printed Circuit Board) Precious and Common Metal Content

Copper (78.2%)	**Tin (12.9%)**	Lead (2.8%)
Zinc (1.4%)	Moly (0.9%)	Titanium (0.82%)
Iron (0.5%)	Manganese (0.5%)	Chrome (0.3%)
Nickel (0.25%)	Cobalt (0.06%)	Cadmium (0.04%)
Silver (1.17%)	**Palladium (0.05%)**	**Gold (0.02%)**
Platinum (0.02%)	**Rhodium (0.002%)**	***Precious Metals***

Unprocessed Scrap Component Prices $s/metric ton (Feb 2015)		
Central Processing Units	$	57,304
Memory Chips	$	22,040
Cell Phones	$	12,122
Mother Boards	$	7,714
Hard Drives	$	1,984
Medium Grade Boards	$	1,940
Low Grade Boards	$	331



eCyclingUSA has systems that can significantly increase the value of unprocessed components, thereby allowing us to buy feedstock.

eCyclingUSA & Partner Locations

Much of Europe has a zero landfill policy. The rest of the world is beginning to recognize the value of their waste streams.

Why Now In The USA?

- American consumption-based mentality is transitioning to a more environmentally-friendly mentality.
- Over the last three decades, US landfills have declined 80% while US recycling has increased 400%.
- USA focus is on municipal solid waste (MSW) emphasizing single stream recycling, composting, and waste-to-energy programs.
- The fastest growing and least attended waste stream in the USA is electronic waste (eWaste).
  - Today, the US landfills or exports 95% of its eWaste.
  - However, new materials reclamation technology makes eWaste reclamation available at the local level.
- China is building four mega (multi-billion dollar) urban mining centers to reclaim high value materials. The Israelis and Brazilians are pursuing similar national-level programs.

Since waste is generated locally, it should be reclaimed locally, and the profits used for local business and job creation.

Typical Plant

Large plant (10 ton/hour)

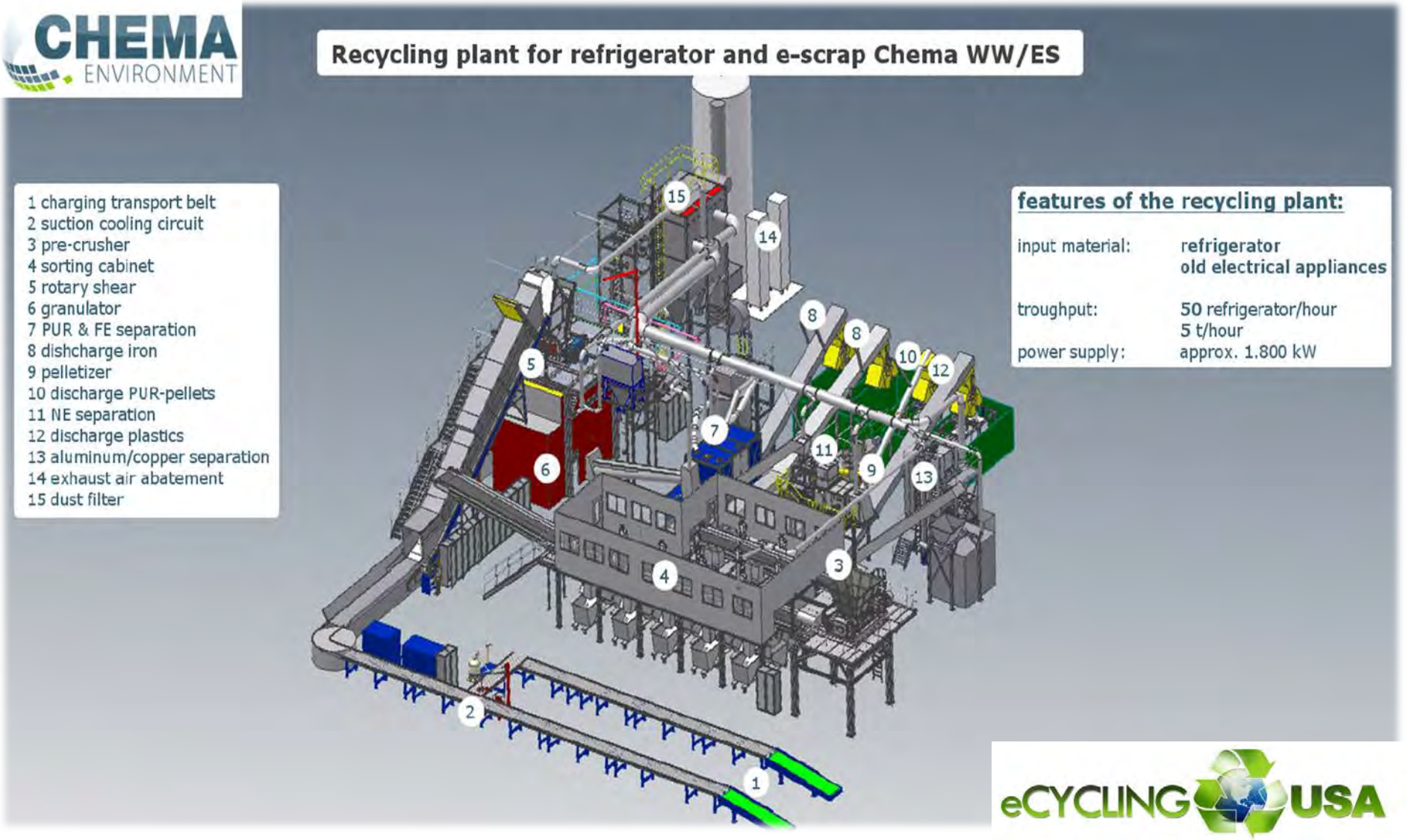
- ≈ $20 million
- ≈ 40,000 square foot facility
- ≈ 10 to 15 acres of land

Small plant (3-5 ton/hour)

- ≈ $10 million
- ≈ 15,000 square foot facility
- ≈ 3 to 10 acres of land

10 months to build and install. Low interest loans for up to 80% equipment by German Export Bank via Euler Hermes.

Typical Layout



This plant layout is ideal for communities with 300,000+ people.

Types of eWaste

- **Commercial Off The Shelf (COTS) Electronics**
  - **IT-Related eWaste** includes computers and assorted peripherals, hardcopy devices, CRTs and mobile devices.
  - **Whiteware eWaste** includes major appliances refrigerators, air conditioners, vending machines, stoves, dishwashers, HVAC systems, water heaters, and whiteware-related ducting, wiring and fixtures.
  - **Brownware eWaste** includes TVs, radios, recorders, telephones, stereo equipment, minor kitchen and home appliances, tools, power equipment, lamps/lighting, and personal electronic devices.
- **Construction & Demolition (C&D) eWaste** includes building materials: copper, aluminum, iron, plastics and foam.
- **Municipal Solid Waste (MSW) eWaste** contains 2% eWaste.
- **Government eWaste.** The USG (not including state and local) spends $15B/year on mission-related electronics and IT systems.

Americans dispose 20 to 30 million tons annually of COTS, CND, MSW and mission-related eWaste.

Sources of eWaste (USA)

- EPA reports that 75% of US eWaste goes to landfills and 25% is recycled. Of the amount recycled, EPA states that 80% is shipped to foreign countries—mainly China and Nigeria.

- Sources:
  - **Homes & businesses**
  - **Equipment manufacturers**
  - **Major retailers**
  - **Non-profits**
  - **Exports** ----------→
  - **Government agencies**
  - **Landfills**
  - **Scrap yards and recyclers**
  - **Construction & demolition**

- 25 states, plus NYC, now restrict eWaste in landfills. Federal government is beginning to restrict eWaste exports.

Most communities have significant untapped sources of eWaste.

eWaste Feedstock Requirements

- **Computers or refrigerators per ton.**
  - 100 personal computers (20 pounds each) = 1 ton
  - 6 refrigerators (350 pounds each) = 1 ton

- **Transportation capabilities.**
  - 40’ shipping container and semi-trailer truck = 20 tons
  - Railroad boxcar = 140 tons
  - Waterway barge = 1,500 tons

- **Feedstock for a 10 ton/hour plant.**
  - 1 shift (8 hours) = 80 tons per day = 4 truck loads per day
  - 3 shift (23 hours) = 230 tons per day = 12 truck loads per day
  - 1 week (3 shifts, 6 days) = 1,380 tons = 10 boxcars or 1 barge

US generates enough annual eWaste to support several hundred materials reclamation centers.

eWaste Plant Employment

- **Direct employees ≈ 100 to 200**

		Employees				
		Per Shift			3 Shift Operation	
		Shift 1	Shift 2	Shift 3	Minimum	Actual*
Combination eWaste (WEEE)-Large Appliance (CFC) for 10 Ton/Hour System		33	25	21	79	**99**
Optional Equipment	TV/CRT System	11	11	11	33	**41**
	Flat Screen/Thin Film Dismantling	2	2	2	6	**8**
	Mobile or Remote Preprossessing	8	8	8	24	**30**
	Smelting Unit	3	3	3	9	**11**
	Cable/Wire Shredder/Separator	3	3	3	9	**11**
		14	**14**	**14**	**42**	**200**

** Includes vacation, sick and absentee allowances*

- **Directly-related employees ≈ 200**. Jobenomics Business Generator programs: transportation, logistics, warehousing, demolition, construction, remediation, energy audit, weatherization, solar panel installation
- **Indirect employment ≈ 2x to 5x ratio** per light-industrial metrics.

Does not include new manufacturing-related jobs.

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