



# Integrating the informal recycling sector into the discarded LCD/LED screens management in Santiago de Chile

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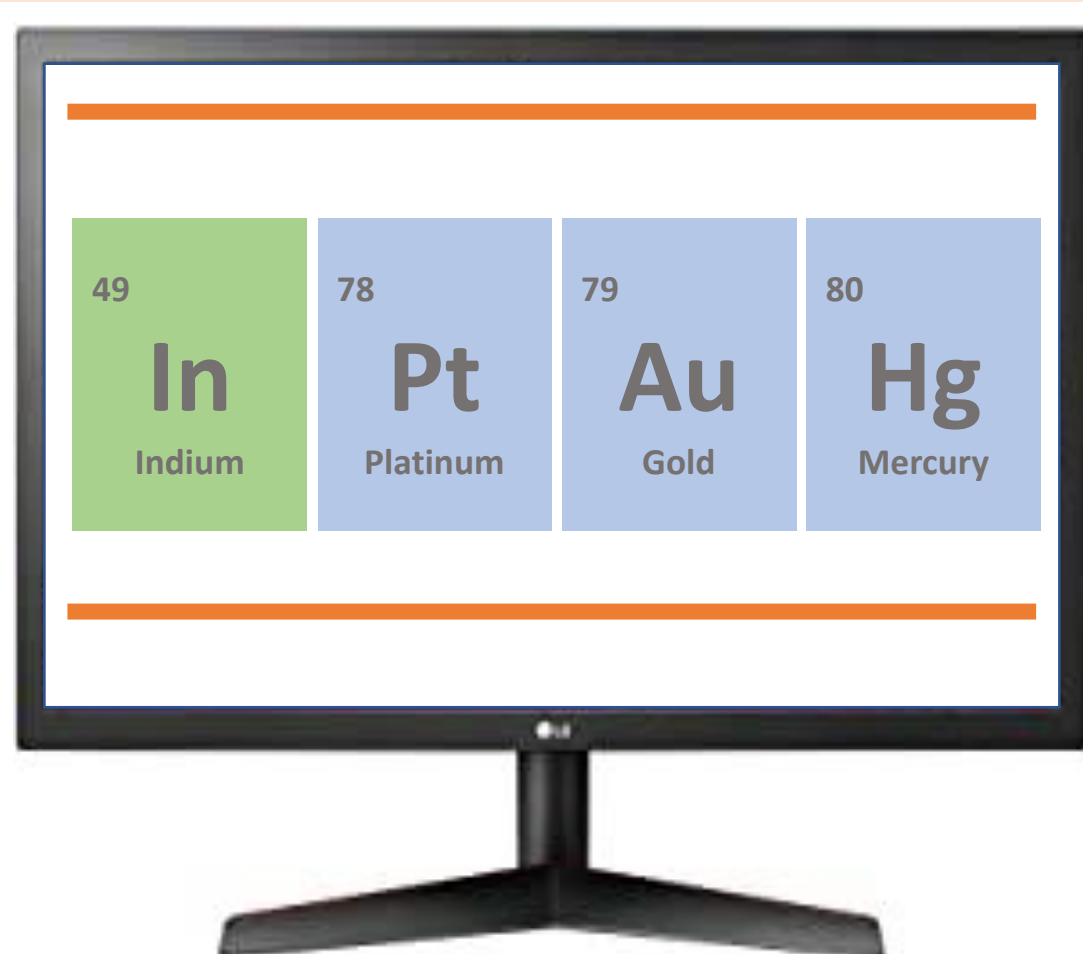
# Integrating the informal recycling sector into the discarded LCD/LED screens management in Santiago de Chile

## Research objective:

Review and identify electronic waste management configurations with explicit consideration of the informal sector and assess their environmental and social performance

## Background

- **Informal recyclers** are men and women who collect waste on the streets or waste facilities to sell them to recycling companies as a way of generating income.
- There are between 12 - 56 million informal recyclers concentrated mostly in Latin America, Asia and North Africa, who are responsible for up to **90% of recycling rates**<sup>1</sup>.
- Due to the lack of security and proper equipment, they are exposed to **hazardous substances and physical injuries**<sup>2</sup>.
- Even though their work is not recognized by the authorities, they have **knowledge and experience** regarding waste collection and management<sup>3</sup>.



- **Liquid-crystal display (LCD) and light-emitting diode (LED) screens** represent 15% of electronic waste (e-waste) in Santiago de Chile<sup>4</sup>.
- They contain **critical elements and precious metals** with a high recycling market value<sup>5</sup>.
- LCD/LED screens present a **high reparability potential**.
- If treated incorrectly, LCD/LED screens can release **toxic elements such as mercury**
- There is **scarce information** about how the informal recycling sector is treating LCD/LED screens in South America, including Chile.

Research question:

**How can the informal recycling sector be integrated to improve the sustainability of LCD/LED screens in Santiago de Chile?**

## Research methods

### Field research

Participant observations and semi-structured interviews will be conducted with formal and informal e-waste management actors in Santiago de Chile to identify how the informal sector is managing discarded LCD/LED screens.

### Scenario analysis

Representation of current and exploratory configurations for the management of discarded LCD/LED screens.

### Environmental and social life cycle assessment

Evaluation of the scenarios in SimaPro to identify critical steps and compare the configurations based on environmental and social indicators.

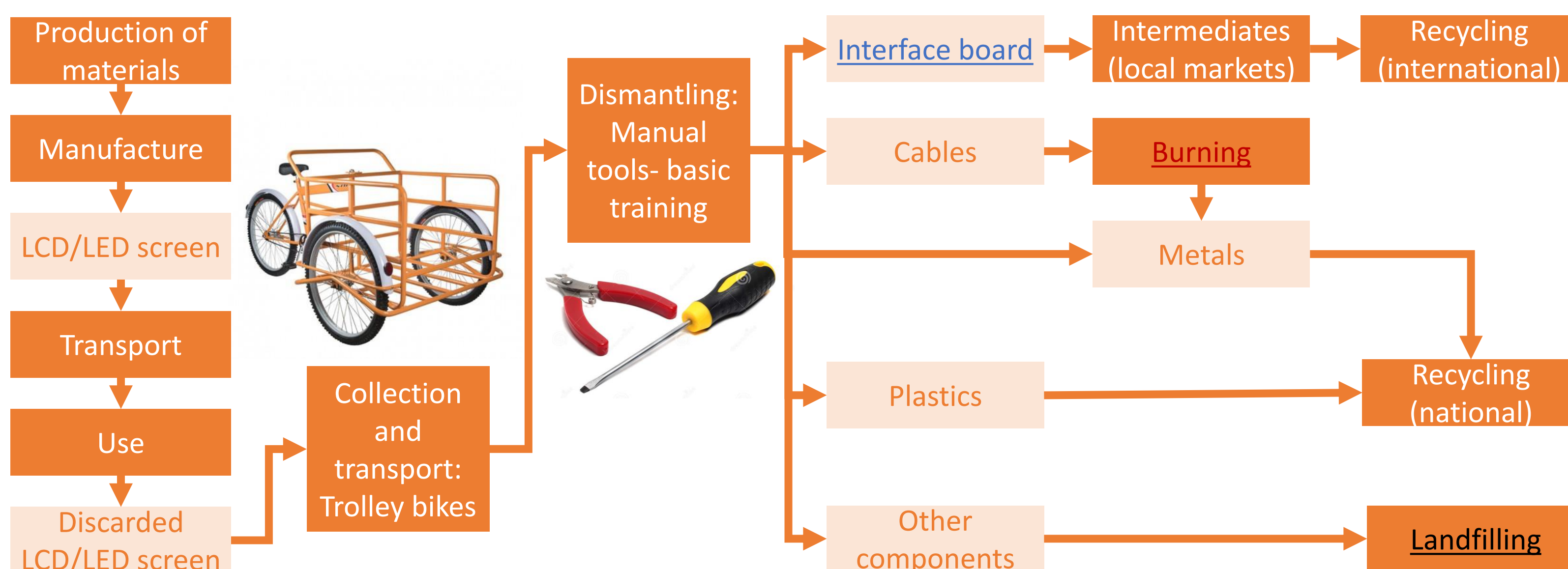
### Environmental indicators:

- Global warming potential
- Human toxicity potential

### Social indicators:

- Income
- Working hours
- Health and safety standards
- Social security and health
- Vacations

## Expected results: current informal management of discarded LCD/LED screens



### Conclusions:

- Informal recyclers in Santiago de Chile are exposed to toxic substances when treating and **burning** components of discarded LCD/LED screens.
- Currently, tools and training for dismantling only allow obtaining **interface boards**. Most of the other components are being disposed of in **landfills**.

**References:** (1) Linzner, R., & Lange, U. (2013). Role and size of informal sector in waste management -a review. Proceedings of Institution of Civil Engineers: Waste and Resource Management, 166(2), 69–83. <https://doi.org/10.1680/warm.12.00012> (2) Scheinberg, Simpson, M., & Gupta, Y. (2010). The Economics of the Informal Sector in Solid Waste Management. Collaborative Working Group Series, 5, 36. (3) Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. 30, 797–808. <https://doi.org/10.1016/j.habitatint.2005.09.005>. (4) Wagner, M., Baldé, C. P., V. Luda, I. C. N., R. Kuehr, G., & Iattoni. (2022). REGIONAL E-WASTE MONITOR for Latin-America, results for the 13 countries participating in project UNIDO-GEF 5554. 274. <https://api.globalewaste.org/publications/file/284/Regional-E-waste-Monitor-for-Latin-America-2022.pdf> (5) Ueberschaar, M., Schlummer, M., Jalalpoor, D., Kaup, N., & Rotter, V. S. (2017). Potential and recycling strategies for LCD panels from WEEE. Recycling, 2(1). <https://doi.org/10.3390/recycling2010007>

