



# Life Cycle Assessment of the operation of the WEEE sorting center in Attica, Greece

K. Abeliotis<sup>1</sup>, K. Lasaridi<sup>1</sup>, C. Chroni<sup>1</sup>,  
Ch. Angelakopoulos<sup>2</sup>

*1. Harokopio University, 2. Appliances Recycling S.A.*

# Waste Electrical and Electronic Equipment generation

Rapid proliferation of EEE

- Technological innovation
- Growth of demand

Decreasing lifespans

Generation of large quantities of WEEE that need to be collected and treated properly



# (W)EEE quantities

It is estimated that\*:

- **There are more than 900 different types of EEE in developed countries**
- **Approximately 50 million tons of WEEE are generated**



# Reuse

- Any operation by which products or components *that are not waste* are used again for the *same* purpose for which they are conceived.

# Preparing for reuse

- Checking, cleaning or repairing recovery operations, by which products or components of products *that have become waste* are prepared so that they can be reused without any other pre-processing.

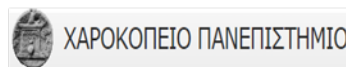
# European Commission (2017)

- WEEE reported reused and prepared for reuse in 2012 in the EU correspond to 2% of the total WEEE collected. The UK, Germany and France lead the way
- Reused WEEE, and prepared for reuse WEEE in Greece is reported to be 0% for 2012



# ReWeee

- In order to enhance the public perception towards the reuse of electric appliances and the prevention of WEEE generation, an initiative has been undertaken by a group of partners, which is implemented via the LIFE+ ReWeee project



# Sorting centers

- Two WEEE sorting centers will operate for the first time in Greece, in the wider region of Attica in southern Greece, and central Macedonia on northern Greece, respectively.



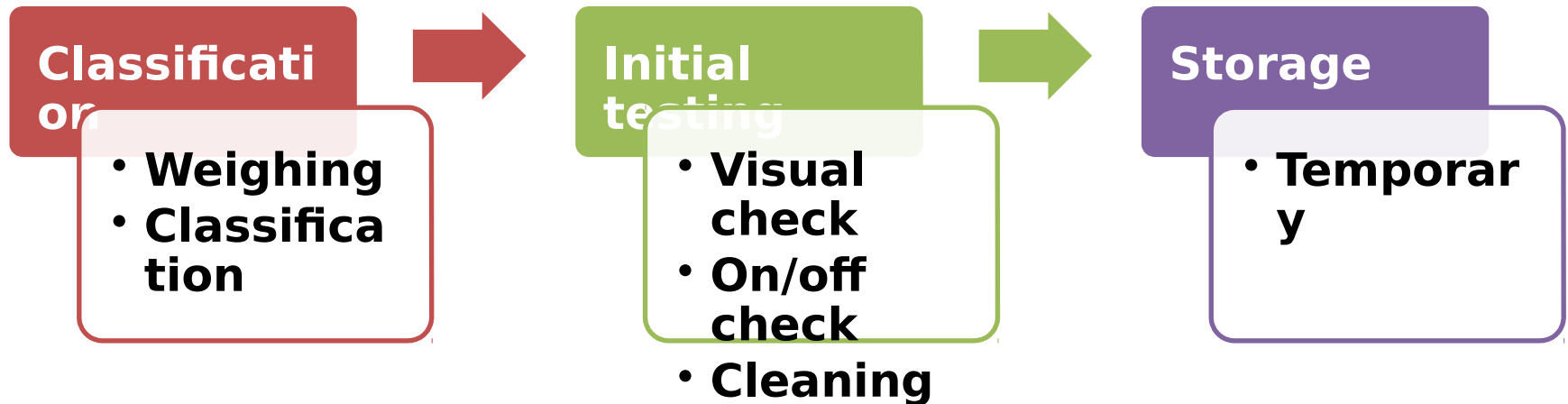
*Operation from 4/2/2019*



## **Infrastructure** **S:**



# Sorting center activities



## Activities:



Reception



Sorting for  
treatment



Sorting for initial  
inspection

# Preparing for reuse activities

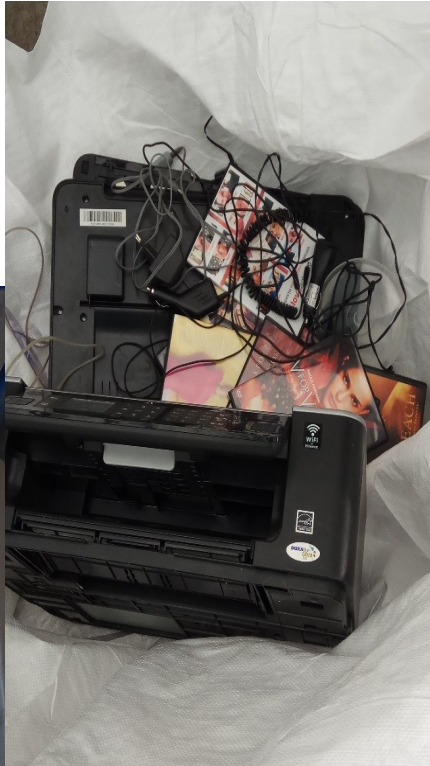




*Activities:*



Sorting for initial inspection



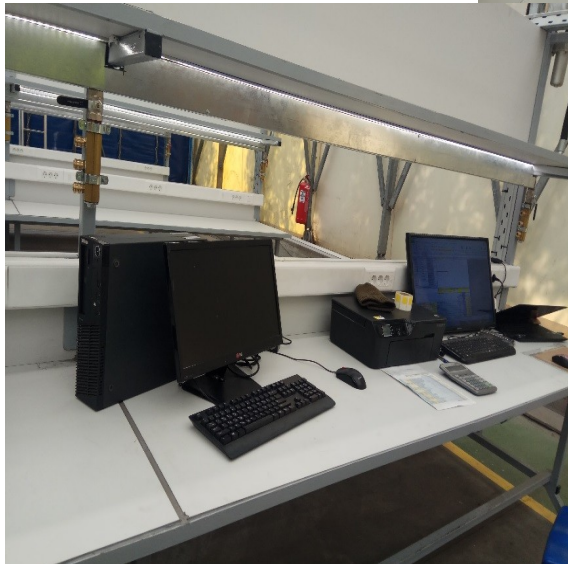
Weighting

# Preparing for reuse activities (2)





## Activities:



Initial  
inspection



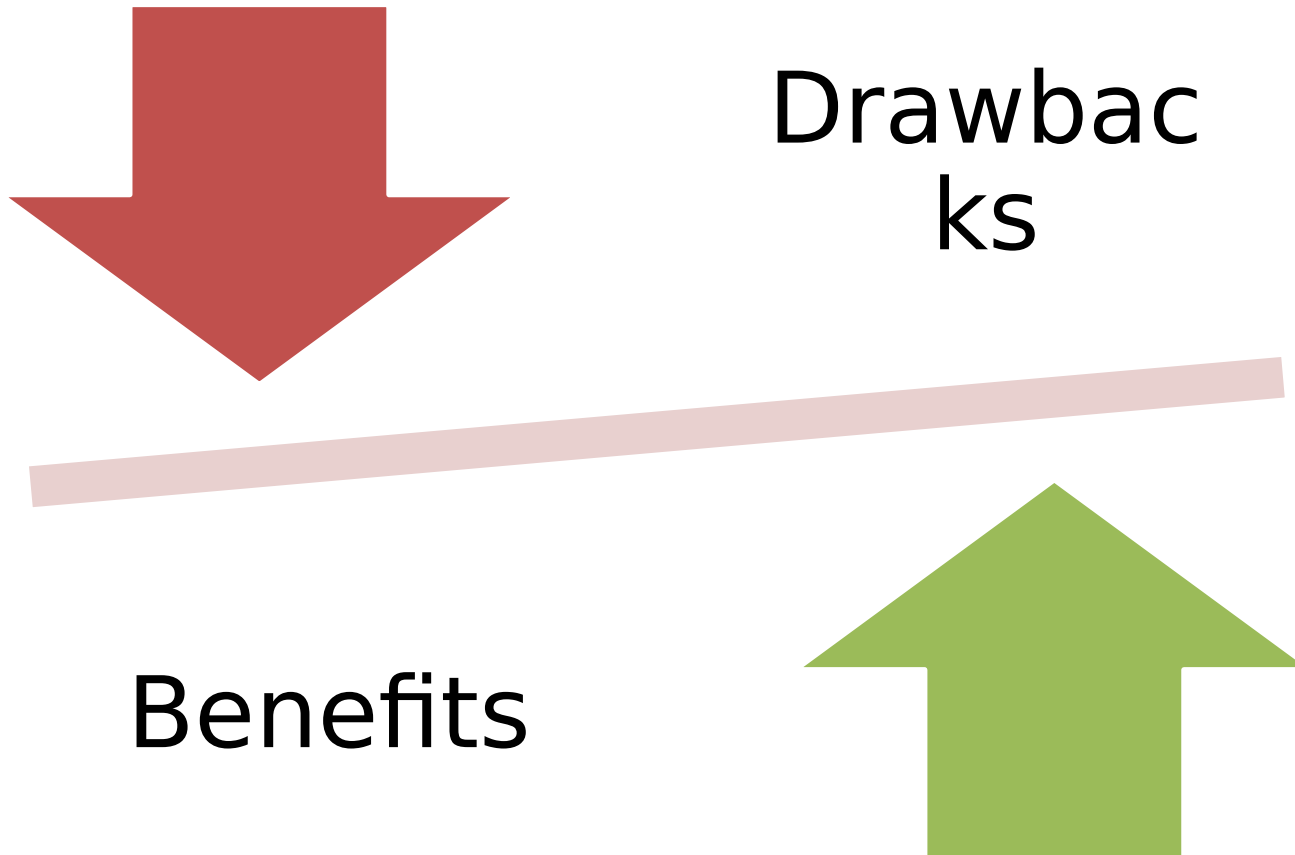
WEEE pending for  
preparing for reuse

# Life Cycle Assessment

- A method to assess the potential environmental impacts and resource consumption throughout a product's life cycle, i.e., from raw material extraction to waste management, including the production and use phases.



# The need for LCA



# **The environmental benefits of the extension of the lifespan:**

- The WEEE stream is reduced
- Raw materials (metals, glass, crude oil for the plastics) are saved
- Energy is saved during the life cycle of the EEE

# Environmental drawbacks

- Raw materials and energy are required for the preparation for reuse and repair of EEE and the operation of the sorting center
- Based on the fact that the energy rating of EEE is improving, extension of the lifespan of older appliances yields to higher electricity consumption

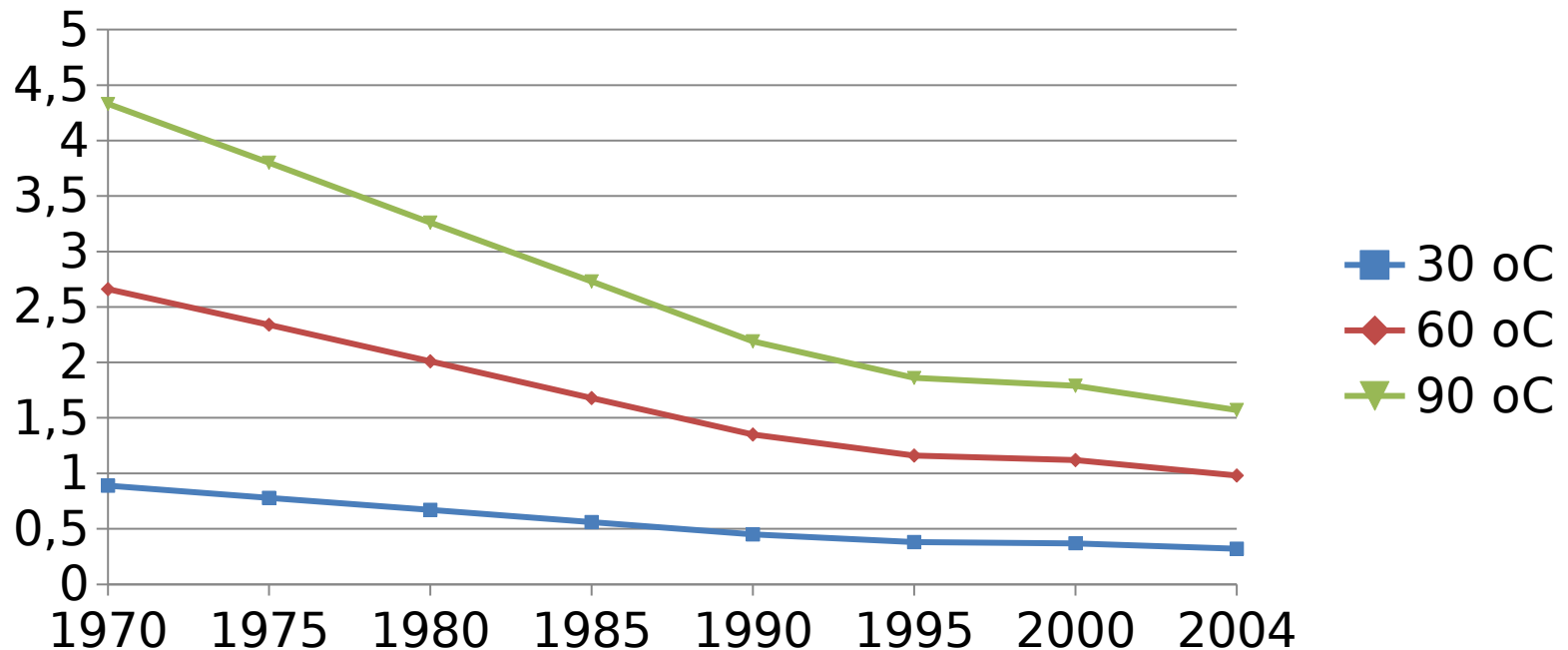
# Life cycle inventory

- Technical reports
- Peer reviewed literature
- Technical manuals

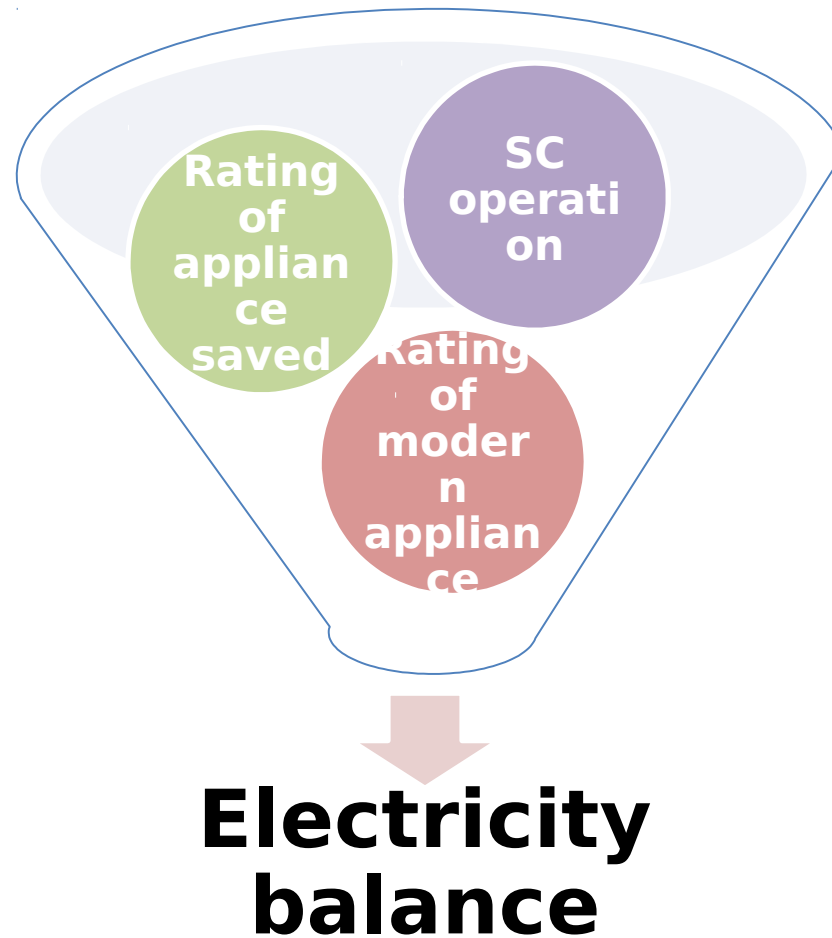
# Mass balance of reused appliances



# Electricity consumption (kWh) in washing machines 1970-2004



# Electricity balance



# Acknowledgements

- The LIFE –REWEEE project is implemented with the co-financing of the European Commission through the LIFE+ Funding programme.



ReWeee

