

ANCIENT EGYPTIAN WOODEN OBJECTS: Contribution to the study of ancient timber and wooden object life-cycles.

Part 1: Flow diagram for the life-cycles of modern timber and wooden products (according to normative standards)

General Methodology

Timber processing and the manufacturing of wooden products are amongst the activities in Egypt for which very limited ancient recording exists. The reconstruction of these operations therefore requires, firstly, detailed investigations of the material remains. Subsequently, the investigation results are interpreted by the use of different methods, depending on the profession(s) of the investigator. For the author, as a trained cabinetmaker, one method for reconstructing ancient woodworking processes is the comparison with modern (standardized) woodworking processes. These reflect the current state of development within the technical history of wood processing since its beginning and therefore, are used as starting point.

Modern industrial standards

R-Principles
One of the main topics in modern industry is sustainability, especially since climate change has become an issue in all areas of life. Several decades ago, concepts were designed to optimize the life-cycles of materials and products, starting with the waste management of them: In 1975 the European Parliament & Council (EPC) issued the first version of the 'Waste Framework Directive' (WFD, 75/442/EEC). In 1996, the new topic of 'Environmental management systems' was developed by the International Standardisation Organisation (ISO) which published the first standard on this topic (ISO 14004). A major component of this is the Life-Cycle Assessment (LCA) of products, with the goal of minimizing environmental impacts by thematizing aspects such as energy required and emissions produced. The first standard on LCA was published in 1997 (ISO 14040).

This modern development for minimizing environmental impact led from 'linear' economy to 'circular' economy and therefore includes the so-called 'R-Principles' (e. g. the principles of 'Reduce, Reuse, Recycling').

Documentation / Visualisation

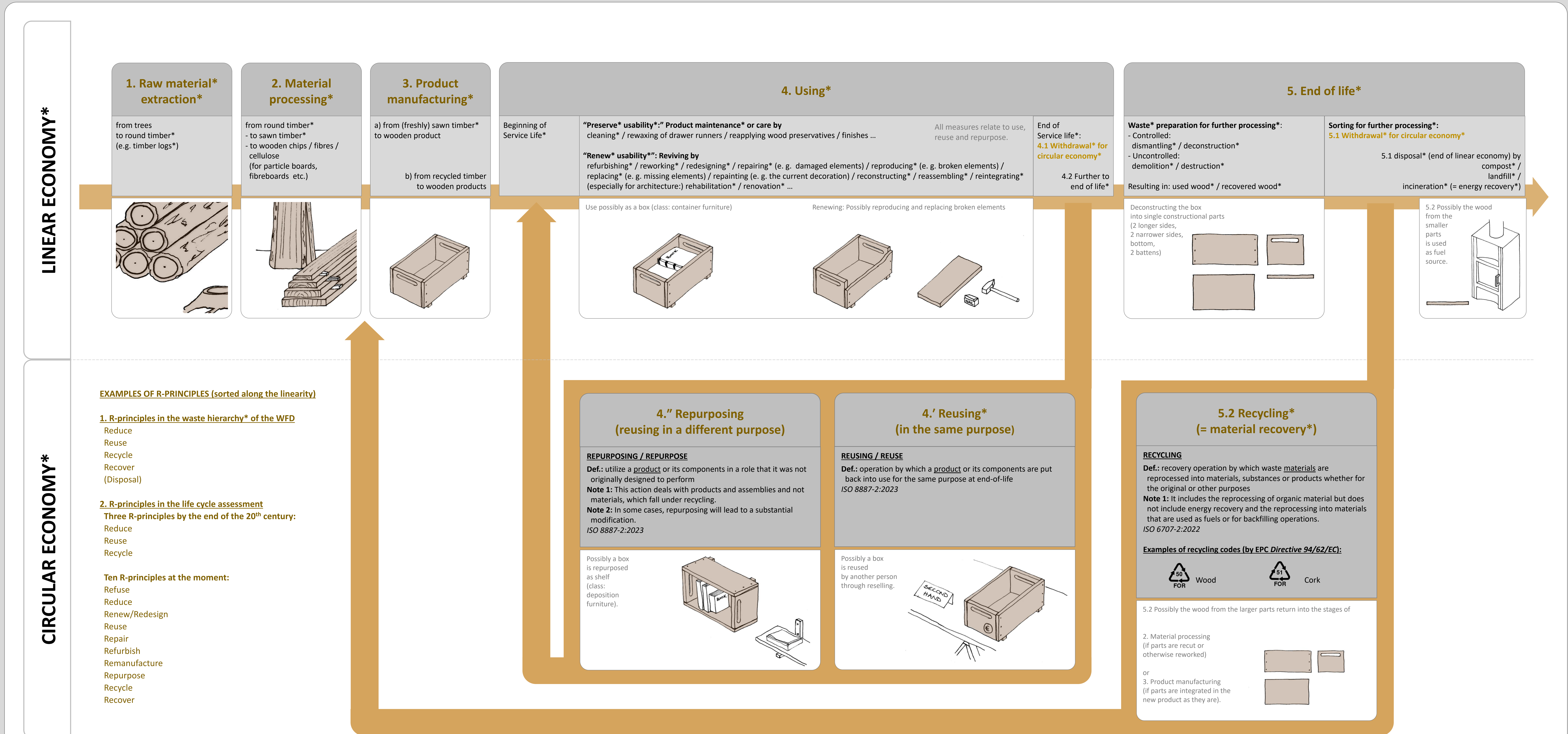
The first step within LCA is called Life-Cycle Inventory (LCI). This step refers to the visual modelling of the life-cycle of a product and the materials used, which results in a flow diagram (ISO 14041, first published in 1998). The flow diagram will later serve as the basis for the Life-Cycle Inventory Analysis.

The content of the flow diagram

Product life-cycle flow diagrams from the woodworking industry serve as a starting point for studying and reconstructing ancient life-cycles of wooden products and the used timber. Therefore, the poster presents a general flow diagram for modern wooden products and will include the relevant R-Principles of 'Reuse', 'Repurpose' and 'Recycling' as defined by the ISO.

Keywords for online search engines

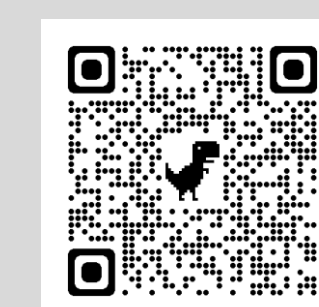
Life-cycle assessment* (LCA) / Life-cycle inventory* (LCI) / Product life cycle* (PLC) / Product life-cycle management* (PLM) / linear economy* / circular economy* / R-principles / Waste hierarchy*



Notes on the flow diagram
- Not included in the flow diagram are:
a) the product-stages* of transport (e. g. from sawmill to cabinetmaker) and distribution (e. g. from manufacturer to end-user*);
b) several more arrows marking other possible process-chains* (to keep the graphic simple).
- The widths of the stage-forms were chosen due to the amount of content needed for the given context.

- The stages of 4.' and 4." represent possibilities (derivatives) in the circularity, not chronological stages. They are presented here in the same arrow due to the available space and format.
- Normative terms (terms defined by Standardisation bodies) are marked with an Asterix (*).
- In the poster mentioned sources are marked in italic, for more sources see the QR-code.
- All drawings are carried out as freehand sketches and are drawn by the author.

For further reading and watching upon Life Cycles of wooden products: [Link](#)



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Coffins in Context
Fitzwilliam Museum and Christ's College, Cambridge
22–24 February 2024