

# Defining Remanufacturing: standardization perspective

*European Remanufacturing Council*

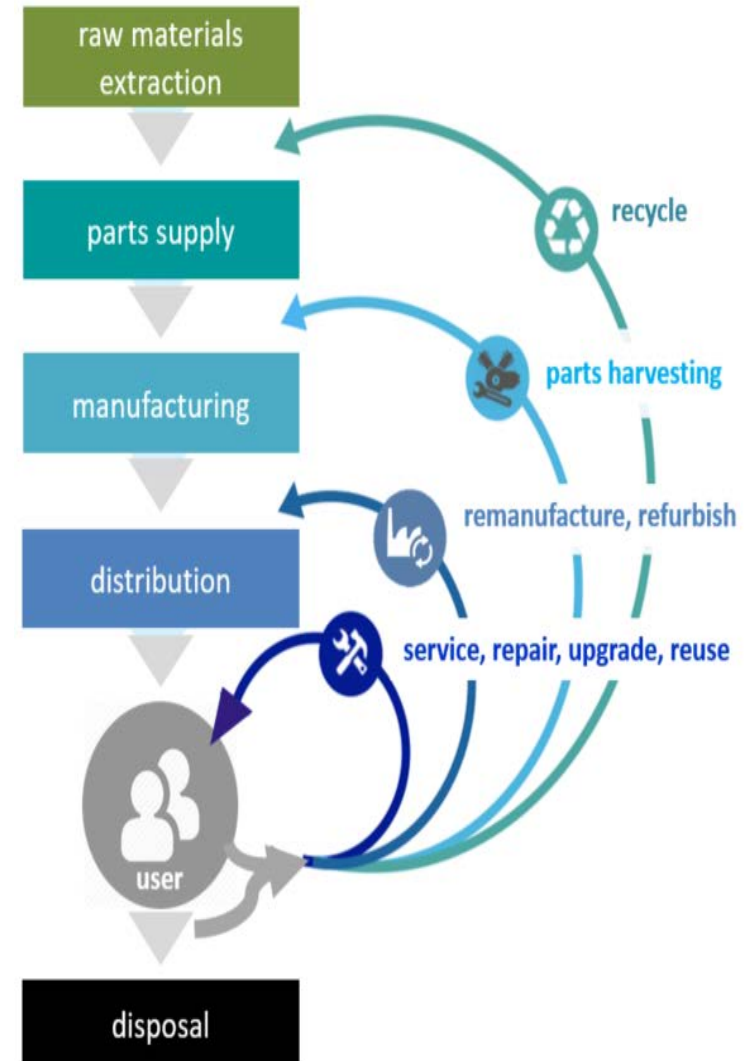
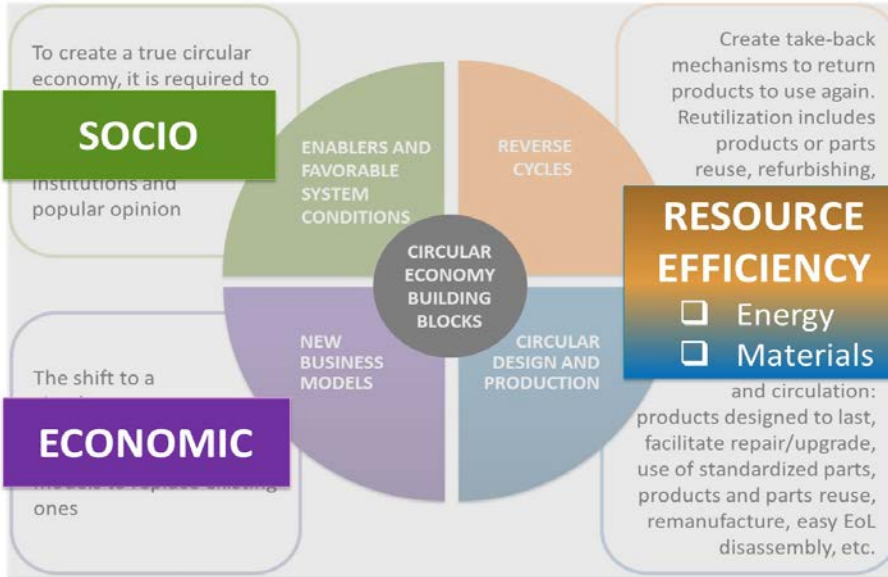
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June 24, 2019

# Outline

- ❑ Circular Economy versus Material Efficiency
- ❑ Circular Economy and related initiatives in the EU
- ❑ Material Efficiency standardization 'CEN-CLC JTC10'  
structure and status
- ❑ EN 45553 ability to remanufacture ErPs
- ❑ Remanufacturing definitions:
  - Various definitions and their commonalities
  - Remanufacturing according to EN 45553
  - The EU COMM view
  - EU Medical Device Regulation
  - Comparing with Refurbishing

# Circular Economy versus Material Efficiency

## BUILDING BLOCKS OF A CIRCULAR ECONOMY



## Material Efficiency

- ...making the flow of materials more circular and reducing / eliminating waste
- energy reduction excluded

# Circular Economy and related initiatives in the EU

- On December 2015 the EU launched its “EU action plan for the Circular Economy”
- The standardization request M/543 was then published asking CEN, CLC & ETSI to develop a suit of generic standards on material efficiency
- Joint CEN-CLC technical committee ‘JTC10’ was set up to develop these standards
- Scope ‘Energy-related Products’
- Topics to be addressed to follow approved workprogram prepared by CEN-CLC (based on M/543)

**CENELEC** BT152/DG9886/DV

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**TECHNICAL BOARD**

|  |              |            |
|--|--------------|------------|
| CENELEC/BT by correspondence             | Agenda item: | 7.3.7      |
| For vote (in line with IR2 clause 6.1.4) | Issue date:  | 2015-11-04 |
| Simultaneous circulation to CEN/BT       | Deadline:    | 2015-12-01 |

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**SUBJECT**

Final draft standardization request with regard to ecodesign requirements on material efficiency aspects

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**BACKGROUND**

See Annex 1.

In line with Decision D150/086, CLC/BT is asked to approve the Standardization Request (final draft) in Annex 2 following the provisions of IR2 clause 6.1.4 (by correspondence, majority + weighted vote). BT is also reminded of the following decision:

D150/065 In line with the principle of management of exception, BT agreed that, at the end of the BT consultation, 'no reply' is considered as 'positive vote' in the context of clause 6.1.4 of IR2 and that any disagreement, considered as 'negative vote', should be accompanied by a comment. The acceptance of the proposal will be calculated in line with clause 6.1.4 of IR2.

A corresponding proposal is submitted to CEN/ET for vote.

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**PROPOSAL(S)**

BT noted the submission to the vote of the Committee on Standards of the final draft 'standardisation request to the European standardisation organisations as regards ecodesign requirements on material efficiency aspects for energy-related products in support of the implementation of Directive 2009/125/EC of the European Parliament and of the Council' as presented in Annex 2 to BT152/DG9886/DV.

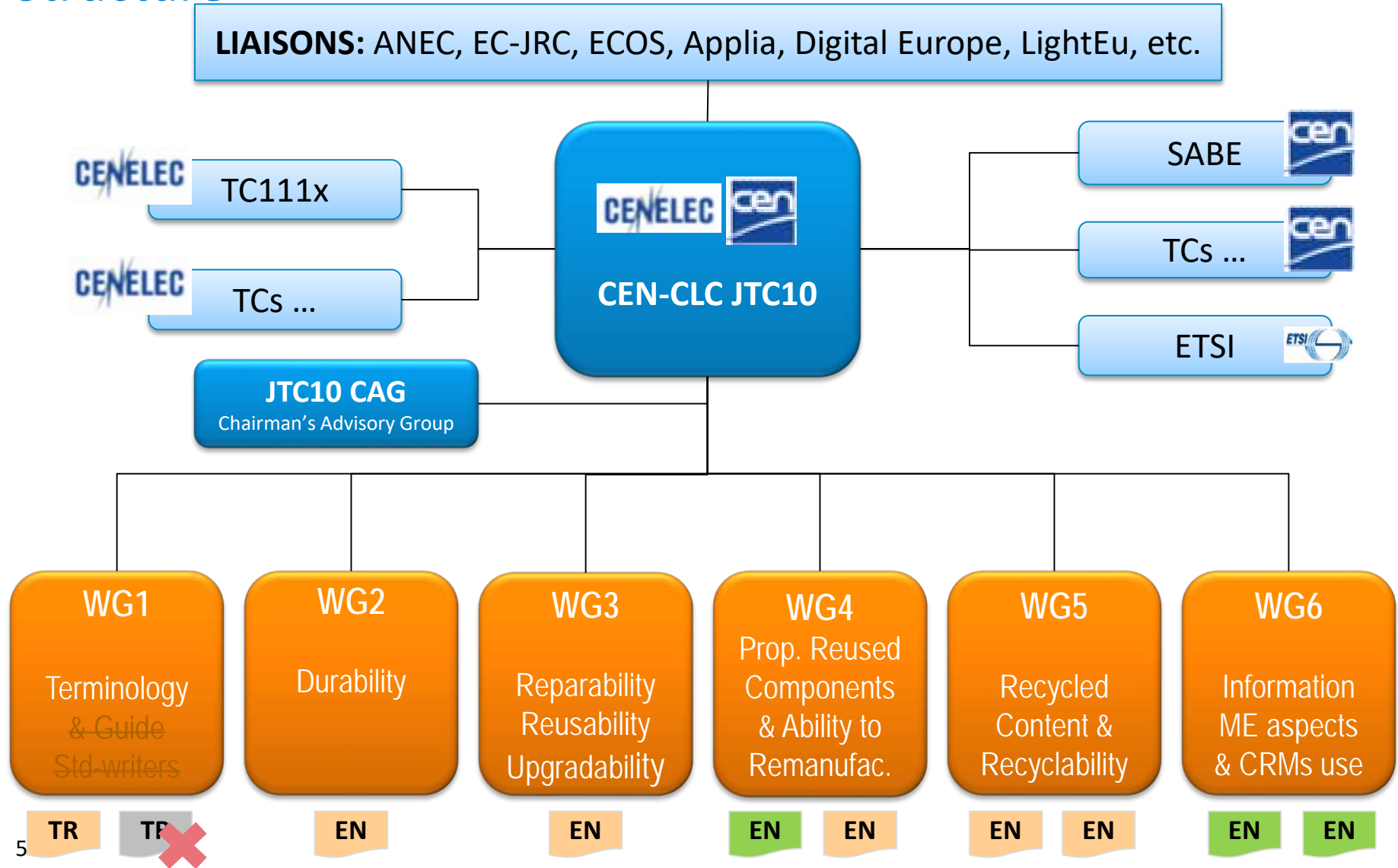
Considering Decision D150/086 and applying the provisions of 6.1.4 of IR 2, BT accepted the 'standardisation request to the European standardisation organisations as regards ecodesign requirements on material efficiency aspects for energy-related products'.

BT tasked the CEN-CENELEC Ecodesign Coordination Group with the overall coordination of standardization activities (including coordination of the elaboration of the work programme) in response to the standardization request.

| EUROPE  |   | INTERNATIONAL |
|---------|---|---------------|
| CEN     | ↔ | ISO           |
| CENELEC | ↔ | IEC           |
| ETSI    | ↔ | ITU           |

# Material Efficiency standardization 'CEN-CLC JTC10'

## Structure



# CEN-CENELEC JTC10 – progress to date

| Document | Title  | Published? |
|----------|--|------------|
| TR 45550 | Definitions related to material efficiency   | No         |
| EN 45552 | General method for the assessment of the durability of energy-related products                         | No         |
| EN 45553 | General method for the assessment of the ability to remanufacture energy-related products              | No         |
| EN 45554 | General methods for the assessment of the ability to repair, reuse and upgrade energy-related products | No         |
| EN 45555 | General methods for assessing the recyclability and recoverability of energy-related products          | No         |
| EN 45556 | General method for assessing the proportion of reused components in energy-related products            | Yes        |
| EN 45557 | General method for assessing the proportion of recycled material content in energy-related products    | No         |
| EN 45558 | General method to declare the use of critical raw materials in energy-related products                 | Yes        |
| EN 45559 | Methods for providing information relating to material efficiency aspects of energy-related products   | Yes        |

# About EN 45553

|          |   |
|----------|---|
| EN 45553 | General method for the assessment of the ability to remanufacture energy-related products |
|----------|---|

- **Horizontal Standard:**

- intended to be used by product standardization committees to develop product-specific standards
- it can be used as such where no product standard exist

- **Objective:**

- Method to assess the ability of products to be remanufactured
- Describes the criteria for the assessment, but does not include a scoring system to quantify it
- Ability to remanufacture parts not include
- Refurbishment is not part of this standard

- **Status of its development:**

- Currently at Formal Vote: from 21 Jun until 16 Aug 2019
- Publication: Expected Early 2020

# EN 45553 'Remanufacturing Matrix'

- Objective of the EN 45553 standard is to provide an assessment method of the ability to remanufacture a product
- It can be expected that legislation in the future will contain requirements covering the extent (how easy or difficult) certain product can be remanufactured

Link between the remanufacturing process steps and product attributes

| Product Attribute                      | Remanufacturing Process Step |             |          |              |          |         |         |
|--|------------------------------|-------------|----------|--------------|----------|---------|---------|
|  | Inspection                   | Disassembly | Cleaning | Reprocessing | Assembly | Testing | Storage |
| Locating access points and fasteners   | X                            | X           |          |              | X        | X       |         |
| Identification and verification        | X                            |             |          |              |          | X       | X       |
| Ability to be accessible               | X                            | X           | X        | X            | X        | X       |         |
| Ability to be disassembled / assembled |                              | X           | X        | X            | X        |         | X       |
| Wear and damage resistance             | X                            | X           | X        | X            | X        | X       | X       |

Each remanufacturing process step is linked to one or more product attribute allowing the assessment of the ability of a product to be remanufactured



# Remanufacturing is...

## Commonalities:

- Industrial process
- Return to like-new / Create a product from used parts
- Refurbishing as a process step

1. **Lund, 1983:** *an **industrial process** in which worn products are disassembled, **refurbished**, and put into inventory. Then the new product is reassembled, fully equivalent - and sometimes superior - in performance and expected life.*
2. **Seaver, 1994:** *the process of rebuilding a product where all worn components are replaced and the product is reassembled, tested and certified.*
3. **Bras et al., 1996:** *the practice of disassembling, cleaning, **refurbishing**, replacing parts and reassembling a product in such a manner that the part is at least as good as, or better than, new. By remanufacturing a product, the product may be returned to service with a reasonably high degree of confidence that it will endure (at least) another full lifecycle.*
4. **APICS, 1998:** *an **industrial process** whereby products are restored to **like-new** condition. In contrast, a repaired or rebuilt product normally retains its identity, and only those parts that have failed or are badly worn are replaced or serviced.*
5. **Sundin, 2004:** *an **industrial process** whereby products referred as **cores** are restored to **useful life**. During this process the core pass through a number of remanufacturing steps, e.g. inspection, disassembly, cleaning, part replacement, **refurbishment**, reassembly, and testing to ensure it meets the desired product standards.*
6. **Östlin, 2008:** *an **industrial process** whereby products, referred to as **cores** are restored to **useful life**. During this process, the core passes through a number of remanufacturing operations, e.g. inspection, disassembly, part **reprocessing**, reassembly, and testing to ensure it meets the desired product standards.*
7. **BSI, 2009:** *the process of returning a used product to at least **OEM original** performance specification from the customer's perspective and giving the resultant product a warranty that is at least equal to that of a newly manufactured equivalent.*
8. **ANSI, 2017:** *a comprehensive and rigorous **industrial process** by which a previously sold, leased, used, worn, or non-functional product or part is returned to a **like-new** or better-than-new condition, from both a quality and performance perspective, through a controlled, reproducible and sustainable process.*
9. **IEV 904-04-10 (IEC):** ***production process that creates products using parts taken from previously used products***

# Remanufacturing according EN 45553 (still draft!)

## 3.1.2 'remanufacturing'

industrial process which produces a product from used products or used parts where at least one important change is made to the product

## 3.1.1 'important change'

modification which influences the safety, original performance, purpose or type of the product

Note 1 to entry: Refer to the EU Blue Guide [1] to check the conditions under which a product may be considered a new product when placing on the market after such changes

Note 2 to entry: The person manufacturer with the correct so on behalf of the original r

**!!! Considering it as new product when placing on the market, demands compliance with all legislations that are applicable at that moment**

# The EU COMM perspective on remanufacturing

*Sustainable products in a circular economy {SWD(2019) 91 final}*

... a process to bring discarded, outdated or no longer functional products to a same-as-new **or better** condition and performance, after which they can re-enter the market... [from European Remanufacturing Network funded under Horizon 2020]

... where products have been subject to **important changes** or overhaul **aiming to modify its original performance, purpose or type** after they have been put into circulation and having a significant impact on its functioning, the product would be subsequently deemed to be a **new product** and that the person who puts this new product into circulation under their name takes responsibility for compliance of that new product with the applicable Union safety legislation... [Blue Guide, 2016/C 272/01]

# European Legislation, *MDR*

*Medical Device Regulation [EU/2017/745]*

**‘manufacturer’** [EU MDR Art2(30)]

... means a natural or legal person who manufactures a device or has a device designed, manufactured or imported into the markets that device under its name or trademark

Fully Refurbishing  
equals to  
Remanufacturing

**‘fully refurbishing’** [EU MDR Art2(31)]

... means the **complete rebuilding** of a device already placed on the market or put into service, or the **making of a new device from used devices**, to bring it into conformity with this Regulation, combined with the assignment of a new lifetime to the refurbished device

**‘substantial/significant change’** [Recommendation NB-MED-2.5.2 rec 2]

any alteration to a medical device, a component, part, process or system that has a major effect on the product’s compliance with the general Safety and Performance requirements, negatively impacts the risk profile of the product, or changes the intended purpose of the product.

# Remanufacturing vs. Refurbishing

- Lund, Bras et al., Sundin, Östlin:  
*defines refurbishing as a process step of remanufacturing*
- EN 45553 does not define refurbishing, but includes a note:  
*... refurbishment is seen as a functional and/or aesthetic restoration of an ErP*
- IEV 904-04-09 (IEC terminology database) (Refurbishing)  
*... functional or aesthetical maintenance or repair of an item to restore to original, upgraded, or other predetermined form and functionality*
- IEC (CDV) 63120 (Medical Equipment) (3.14 REFURBISHMENT)  
*... process applied under the responsibility of the refurbisher to **restore used MEE/MES** to a released configuration by the manufacturer that has documented compliance to basic safety and essential performance **comparable to when new with the intention to extend the life-cycle.***  
*Note 1 to entry: Refurbishment can include activities such as repair, rework, replacement of worn parts, and update of software/hardware but **shall not include activities that result in regulatory submissions.** ...*



**CENELEC**