# EU-REI

Creating a Resource Efficient India

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# Resource Efficiency and Circular Economy in the Indian Context

# Module 4c

## Tools, standards and indicators for RE and CE: Standards

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CII-ITC Centre of Excellence for Sustainable Development
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# Course overview: module 4c

**Basic modules**

| | |
|---|---|
| 1 | Introductory session |
| 2 | Foundations of RE and CE in the international context |
| 3 | Towards RE and CE through sectoral strategies in India |

**Applied and advanced modules**

| | | |
|---|---|---|
| 4 | | Tools, standards and indicators for RE and CE |
| | 4a | Material Flow Analysis |
| | 4b | Life Cycle Assessment |
| | 4c | RE and CE Standards |
| | 4d | RE and CE Indicators |
| | 4e | Public Procurement |
| | 4f | Circular Business Models |
| | 4g | RE and CE Funding |

**Recap and evaluation**

| | |
|---|---|
| 5 | Summary, outlook and evaluation |

# Learning objectives

**After completion of module 4c, participants will be able to**

- relate to the relevance of standards, their disadvantages and benefits and to their role within sectoral strategies
- outline levels on which standardization takes place in India and at international level
- understand opportunities for lifecycle considerations when developing standards

# Standards

- Standards are integral to modern day life
- How many standards are in a notebook?

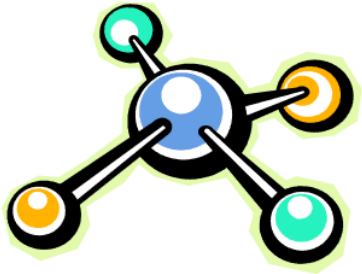
More than 250 interoperability standards

**Formal definition of standards:**

Document, **established by consensus** and **approved by a recognized body**, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context

# Standards

## EU typology of standards – 4 major categories



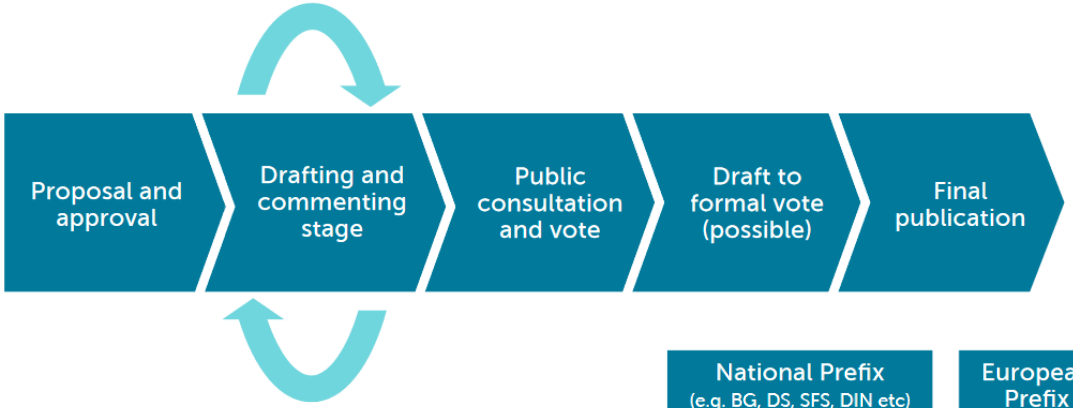
- **Fundamental**
  Terminology, conventions, signs, symbols
- **Test methods and analytical methods**
- **Specifications for products, services, systems, performance**
- **Organization and management system standards**

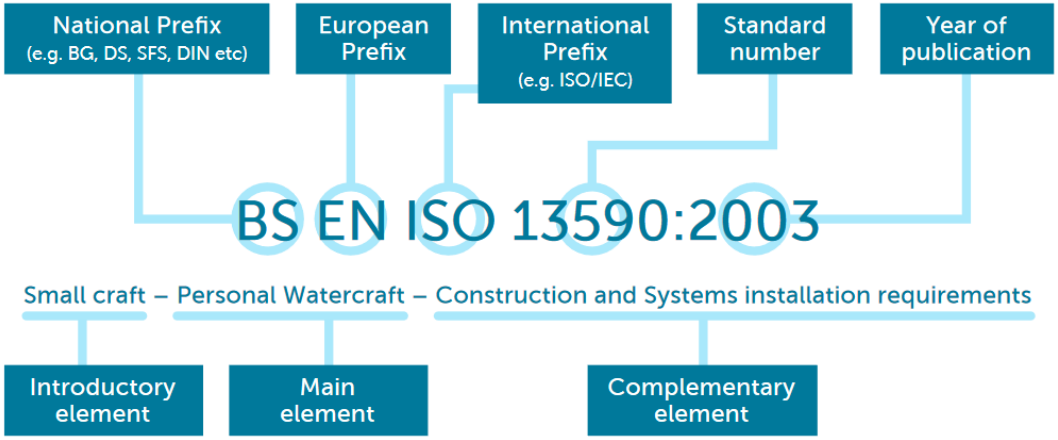
Module 4c focuses mainly on **product standards**

Picture source: https://www.cencenelec.eu/research/innovation/standardstypes/Documents/Standard%20Types.pdf

# Standards

Standards are usually developed in a five-step process and followed a standardised nomenclature for easy identification.



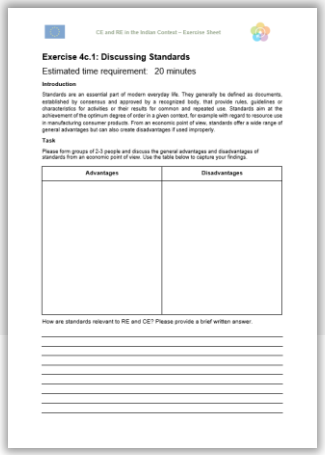

Picture source: https://www.ds.dk/~/media/DS/Files/Downloads/Uni/A-World-Built-on-Standards.pdf

# Exercise: Discussing Standards

## Exercise 4c.1: Discussion

- Please form groups of 2-3 people and discuss the following questions:
  - What are the general advantages and disadvantages of standards from an economic point of view?
  - How are standards relevant in the context of RE and CE?
- Kindly capture your findings in the exercise sheet.

**Estimated time requirement: 20 min.**



CE and RE in the Indian Context – Exercise Sheet

**Exercise 4c.1: Discussing Standards**

Estimated time requirement: 20 minutes

**Introduction**

Standards are an essential part of modern everyday life. They generally be defined as documents, established by consensus and approved by a recognized body, that provide rules, guidelines or characteristics for activities or their results for common and repeated use. Standards aim at the achievement of the optimum degree of order in a given context, for example with regard to resource use in manufacturing consumer products. From an economic point of view, standards offer a wide range of general advantages but can also create disadvantages if used improperly.

**Task**

Please form groups of 2-3 people and discuss the general advantages and disadvantages of standards from an economic point of view. Use the table below to capture your findings.

| Advantages | Disadvantages |
|---|---|
| | |

How are standards relevant to RE and CE? Please provide a brief written answer:

# Exercise: Discussing Standards

## Solutions

### Advantages

- ✓ Standardised production enables **economies of scale** (reduced cost per product)
- ✓ **High quality** of products and services, value addition for consumers
- ✓ Standards allow to sell uniform products on the **global market**/ capture of global market segments
- ✓ **Development by experts** and practitioners allows to capture knowledge and lessons learnt
- ✓ **Consumer protection** (product safety)
- ✓ **Gateway function** by indicating compliance and good practice

### Disadvantages

- × Uniqueness of products and services can be comprised
- × Possible market barriers and restriction of free trade of goods and services
- × Possible additional costs by over-regulating technical aspects in the production or product development process
- × Installment of verification processes for testing the compliance with standards requires a functioning eco-system and requires monetary resources
- × Standards can be difficult to understand for laymen due to their often technical nature and bulky language

# Standardisation bodies

| Standardization on 3 levels…. | |
|---|---|
| National | Bureau of Indian Standards (BIS) |
| Regional | South Asian Regional Standards Organization (SARSO) |
| Global | International Standards Organization (ISO) |

| …and in different types of institutions |
|---|
| Industrial consortia |
| Branches of business organizations/companies |
| Professional associations |
| Governmental agencies |
| Formal standardization organizations |

# Standardisation bodies

Bureau of Indian Standards
The National Standards Body of India

**National level**

- Over the past 70 years, BIS has developed over 20,000 Indian Standards (IS)
- Almost 50% are product-related standards whereas 50% are process-related (support) standards such as test methods, terminology, codes of practices
- Responsible for
  - Formulation of Indian Standards
  - Testing, Calibration and Training Services
  - Registration Scheme for Electronic and Information Tech Goods
  - Foreign manufacturers' certification scheme
  - Technical Information Services including WTO-TBT Enquiry Point
  - Certification: Product Hallmarking
- Over 650 Technical Committees operate within 14 division councils representing sectoral interests
- A sizeable number of IS have been harmonised with ISO/IEC Standards to facilitate acceptance of Indian products in the international market

# Standardisation bodies


**National level**

- As a result of various consultation from 2014 to 2017 between experts and stakeholders involved in standardization, the Indian government drafted the **“Indian National Strategy for Standardization”**
- The strategy addresses the four pillars of the Quality Ecosystem
  - (i) Standards Development
  - (ii) Conformity Assessment
  - (iii) Technical Regulations and SPS Measures and
  - (iv) Awareness and Education and determines the goals for the upcoming years for each pillar
- Currently few activities and existing standards, which explicitly address CE and RE.

# Standardisation bodies

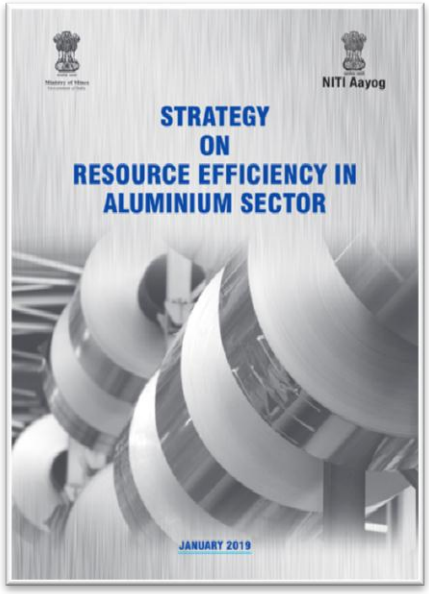

**National level**

- Sector specific standardization work is carried out by more than 25 other bodies, e.g.:
  - Marine Products Export Development Authority
  - Agricultural and Processed Food Products Export Development Authority
  - Ministry of Environment, Forest and Climate Change
  - Automotive Research Association of India
  - Quality Council of India (QCI)
  - Telecommunication Engineering Centre
  - Tea Boards of India
- Currently, the different institutes follow their own procedures since there is no uniform system, which integrates processes into national standards
- Harmonisation is currently being pursued by the BIS, e.g. as part of Standardization Strategy

# Standardisation bodies


- Several overseas standards organizations have established offices in India to assist the Indian industry in adoption of their standards, to meet international trade obligations:
  - Seconded European Standardization Expert in India (SESEI)
  - American Society of Mechanical Engineers (ASME)
  - International Association of Plumbing and Mechanical Officials (IAPMO)
  - The Institute of Electrical and Electronics Engineers

# Sectoral standards




**Strategy on Resource Efficiency in Aluminium Sector – findings on standardization**

- Scrap usage in India is diffused and not regulated through standards or end-use restrictions with heavy reliance on imports
- Aluminium scrap standards like European Union and China shall be developed to improve the quality of recycled metal, reduce the processing cost etc.

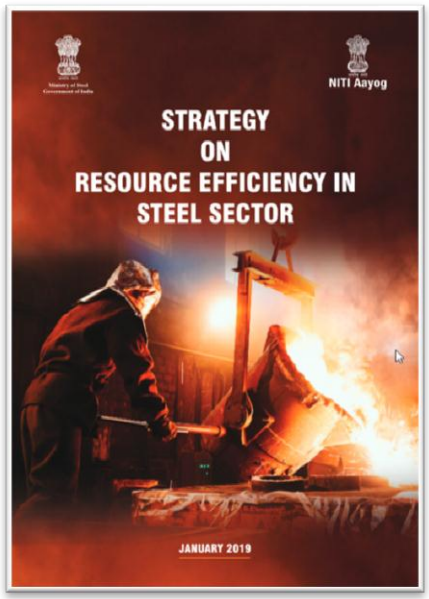
## Selected IS in the aluminium sector

| Standard | Title |
|---|---|
| IS 733:1983 | Wrought Aluminium and Aluminium Alloy Bars, Rods and Section |
| IS 1253:1992 | Aluminium for Use in Iron and Steel Manufacture |
| ISO TC-226 | Materials for production of primary aluminium |

**>80 published standards**

Picture source: https://www.eu-rei.com/

# Sectoral standards




**Strategy on Resource Efficiency in Steel Sector – findings on standardization**

- Minimum environmental standards are required and to be introduced for scrap metal facilities across the industry
- Environmental concerns are greatest where end-of-life vehicles and/or white goods are to be processed

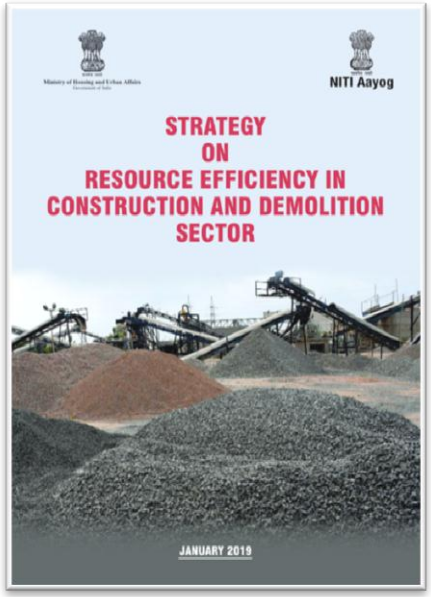
## Selected IS in the steel sector

| Standard | Title |
|---|---|
| ISO TC-17 SC-3 (P): | Steels for structural purposes |
| ISO TC- 17/SC 11 SC-MTD 16 (P): | Steel castings |
| ISO TC-5 SC-1 (P): | Steel tubes |

**>270 published standards**

Picture source: https://www.eu-rei.com/

# Sectoral standards




**Strategy on Resource Efficiency in C&D sector – findings on standardization**

- Prepare standards for suitable utilisation of recycled products from C&D waste in construction and in roads
- BIS 383 standard was revised in 2016 to allow for specific uses of recycled coarse and fine aggregates within certain restrictions
- BIS to promote standards and inclusion in National Building Code

## Selected BIS Standards in the C&D Sector

| Standard | Title |
|---|---|
| IRC-121:2017 | Guidelines for Use of C&D Waste in Road Sector |
| IS 383: 2016 | Coarse and Fine Aggregate for Concrete - Specification |

**>150 published standards**

Picture source: https://www.eu-rei.com/

# Sectoral standards


**Strategy on Resource Efficiency in EEE sector – findings on standardization**

- India has developed guidelines and standards for new product development in the electronics sector
- However standards for the use of secondary materials are not yet specified
- Standards are needed for recycling to mitigate the environmental and health impacts of unsafe recycling in the informal sector

## Selected IS Standards in the EEE Sector

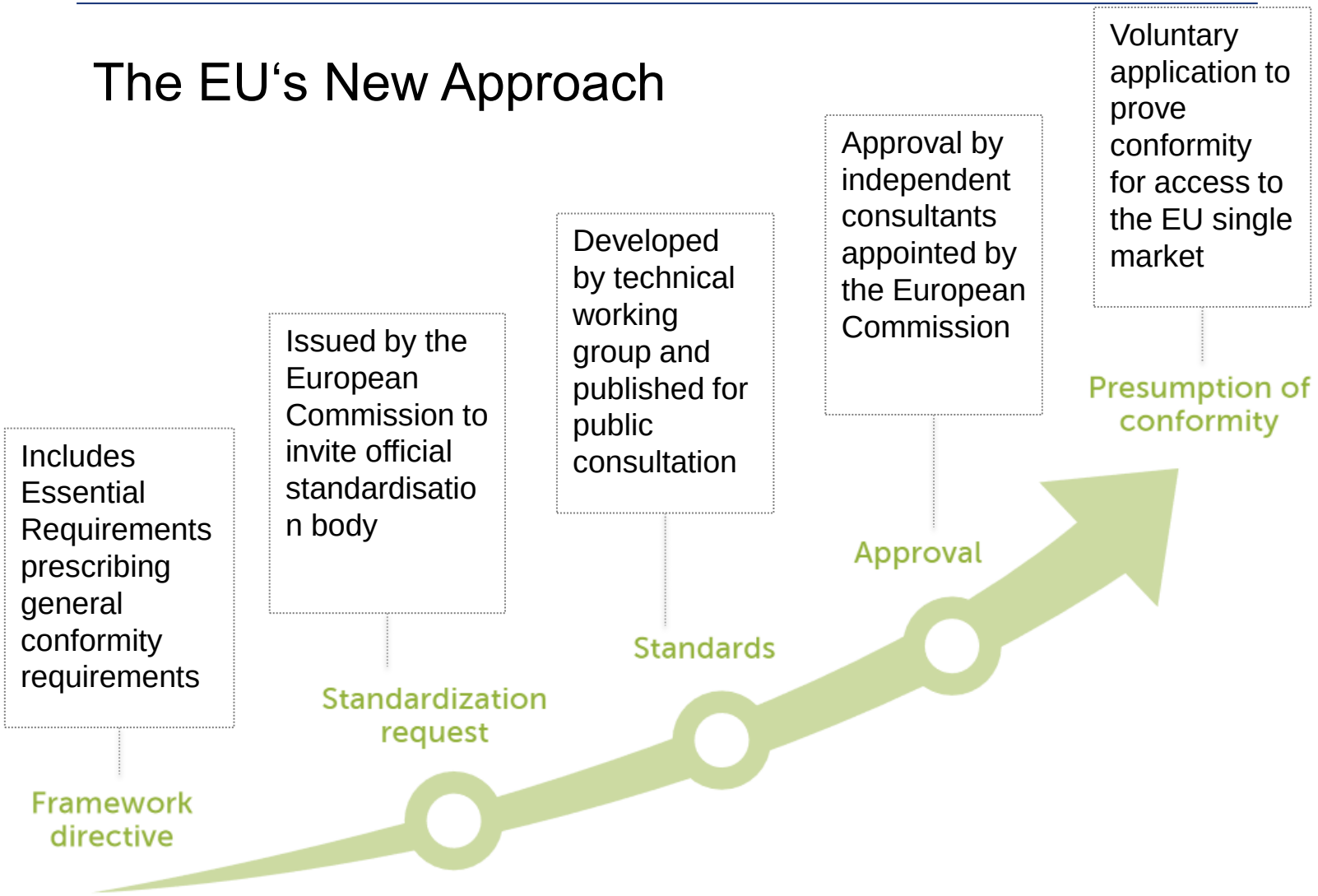
| Standard | Title |
|---|---|
| IEC TC-111 (P) | Environmental standardization for electrical and electronic products and systems |
| IEC TC- 59A | Performance of household and similar electrical appliances |
| IEC TC- 104 (O) | Environmental conditions, classification and methods of testing |

**~2000 published standards**

Picture source: https://www.eu-rei.com/

# Standards and the environment

## The EU‘s New Approach




Picture source: https://www.ds.dk/~/media/DS/Files/Downloads/Uni/A-World-Built-on-Standards.pdf

# Standards and the environment

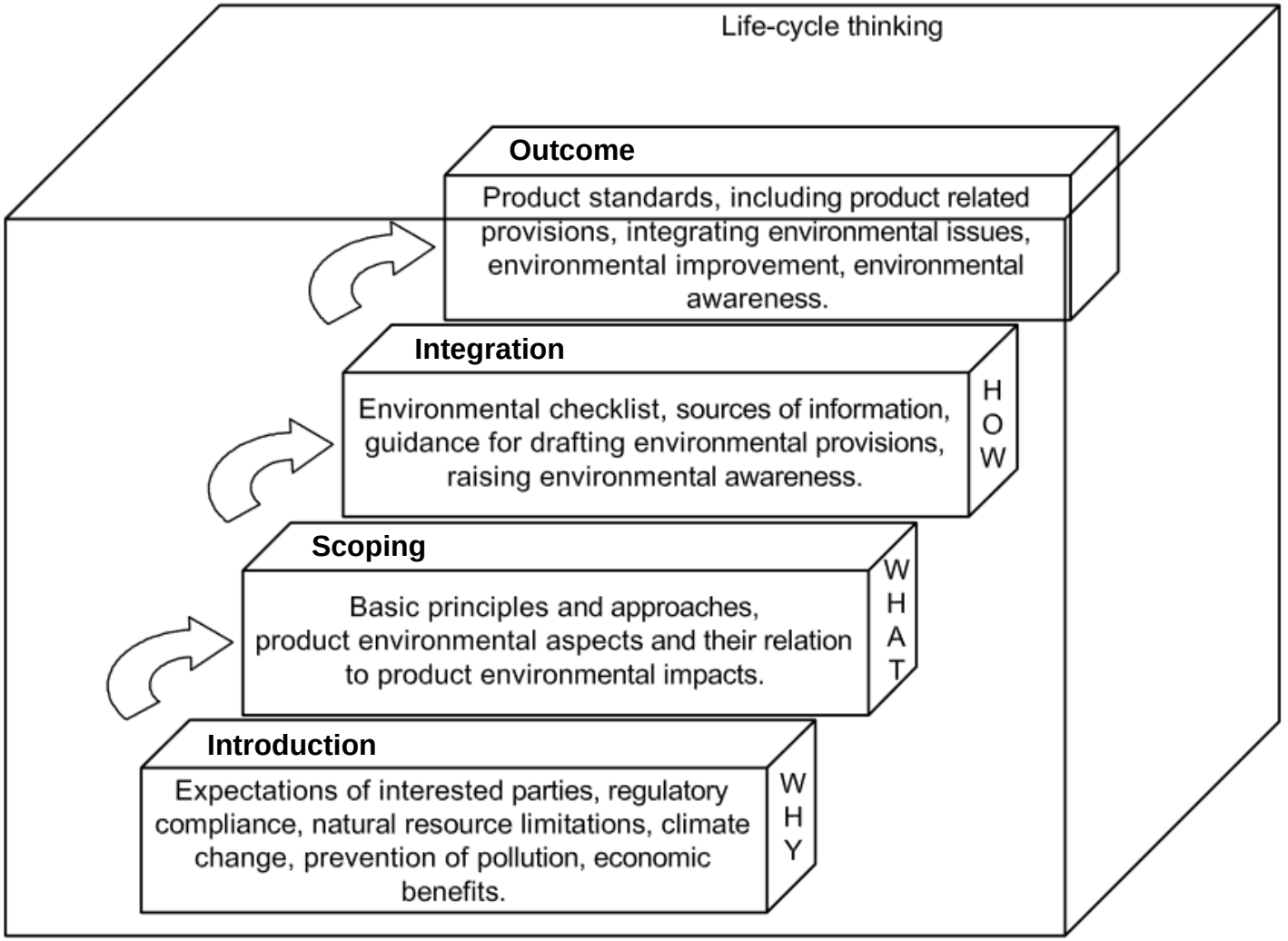
- When writing a product standard, it is important to evaluate how products can affect the environment
- Ideally, this evaluation is conducted as early as possible in the process of standard development
- To this end, the European Union's CEN Environmental Helpdesk (CEN/EHD) provides information, support and useful tools to CEN Technical Committees (TCs) and Working Groups for including environmental issues on a life-cycle-basis in European Standards

# Standards and the environment

The EU‘s four-step approach for the inclusion of environmental provisions in product standards:

1. Considerations of environmental aspects in standards development are driven by stakeholders interests
2. Standard writers should be made aware of how it is possible to make an effective contribution to environmental improvement through a product standard and how the product interacts with the environment
3. Writers of product standards should assess the relevant product environmental aspects, based on the application of life-cycle thinking
4. As an outcome, based on this information and additional guidance, environmental provisions can be drafted in product standards and included as part of technical clauses

# Standards and the environment




Picture source: https://boss.cen.eu/ref/CEN_4.pdf

# Exercise: Environmental checklist

## Exercise 4c.2: Environmental checklist

- Form groups of 2-3 people and analyze the background text
- Go through the checklist in table 1 below and identify the environmental aspects relevant to the product
- Fill in each box by using the information presented in the text
- Please fill in other relevant aspects and provide at least three recommendations on how to include environmental considerations in the comments section

**Estimated time requirement: 30 min**

# Exercise: Environmental checklist

## Solutions

| Technical working group: RECE-2025 | Title of standard: CEN - EN 771-1: Specification for masonry units - Part 1: Clay bricks | Date of last modification of the environmental checklist: Date of training |
|---|---|---|

| Environmental Issue | Stages of the lifecycle | | | | | | | | | | All stages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acquisition | | Production | | Use | | | End-of-Life | | | |
| | Raw materials and energy | Premanu-factured materials & components | Production | Packaging | Use | Maintenance and repair | Use of additional products | Reuse/ Material and Energy Recovery | Incineration without energy | Final disposal | Transportation |
| **Inputs** | | | | | | | | | | | |
| Materials | 0.15 m³ | | | | | | | | | | |
| Water | 0.38 l | | 0.08 l + 0.026 l | | | | | | | | |
| Energy | 0.01 kWh | 0.01 kWh | 0.015 kWh + 0.012 kWh | | | | | 1.45 kWh | | 14.88 kWh | 0.002 kWh + 4.03 kWh |
| Land | | | | | 0.05 m² | | | 0.0007 m² | | 0.0717 m² | |
| **Outputs** | | | | | | | | | | | |
| Emissions to air | 0.06 kg CO2-eq | 0.02 kg CO2-eq | 0.03 kg CO2-eq + 0.16 kg CO2-eq | | | | | 0.34 kg CO2-eq | | 2.34 kg CO2-eq | 0.004 kg CO2-eq + 0.84 kg CO2-eq |

# Exercise: Environmental checklist

## Solutions

**Comments:**

Based on LCA results of clay bricks, the following clauses could be included in standard CEN - EN 771-1:

1) use of secondary raw materials during production;
2) lightweight construction to reduce required amount of material during production;
3) consumer information on thermal insulation value for reference during use phase.

| Other relevant aspects | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Risk to the environ-ment from accidents or uninten-ded use | Health and safety during mining operation s | | Health and safety during milling and drying operations | | Structural stability | | | Health and safety during demolition | | | |
| Customer information | | | Recycled content | | Insulation factor | | | | | | |

# Standards on RE and CE

- The European‘s Joint Research Centre (JRC) launched a technical comittee to draft dedicated material efficiency standards for energy-related products
- Publication scheduled for early 2020
- Committee elaborates 10 standards on material efficiency aspects for ecodesign of energy-related products (ERP):

| Standard | Description |
|---|---|
| EN 45551 | Guide on how to use material efficiency standards when writing ERP specific standardization deliverables |
| EN 45552 | General method for the assessment of the durability of ERP |
| EN 45553 | General method for the assessment of the ability to re-manufacture ERP |
| EN 45554 | General methods for the assessment of the ability to repair, reuse and upgrade |
| EN 45555 | General methodology to assess the recyclability, the recoverability of ERPs and the recyclability of critical raw materials |
| EN 45556 | General method for assessing the proportion of re-used components in ERP |
| EN 45557 | General method for assessing the proportion of recycled content in an ERP |
| EN 45558 | General method to declare the use of critical raw materials in ERP |
| EN 45559 | Methods for providing information relating to material efficiency aspects of energy related products |

# Standards on RE and CE

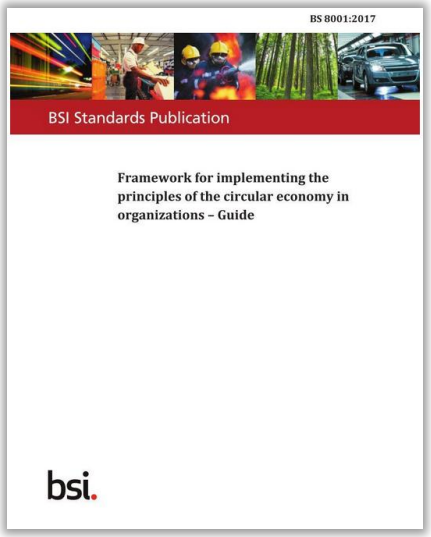
- WEEE Label of Excellence standards for e-waste management introduced in 2011
- Gradually transposed into full-fletched EN standards via CENELEC:

| Standard | Description |
|---|---|
| EN 50625-1 | Collection, logistics & treatment requirements for WEEE. General treatment requirements |
| EN 50625-2-1 | Lamps Requirements and related CLC/TS 50625-3-2 Lamps Technical Specification |
| EN 50625-2-2 | Displays Requirements and related CLC/TS 50625-3-3 Displays Technical Specification |
| EN 50625-2-3 | Temperature exchange equipment Requirements and related CLC/TS 50625-3-4 Temperature exchange equipment Technical Specification |
| EN 50625-2-4 | Photovoltaic panels Requirements and related CLC/TS 50625-3-5 Photovoltaic panels Technical Specification |
| CLC/TS 50625-3-1 | Collection, logistics & treatment requirements for WEEE. Specification for de-pollution. |
| EN 50614 | Requirements for the preparing for re-use of waste electrical and electronic equipment |

# Standards on RE and CE

**Launch of a new standard for the circular economy "BS 8001:2017 – Framework for implementing the principles of the circular economy in organizations. Guide"**

- Provides guidance for organizations to implement the principles of the circular economy
- Intended to apply to any organization, regardless of location, size and sector and type
- Focusses on smaller "quick wins"
- Holistic approach on rethinking how their resources are managed to enhance financial, environmental and social benefits.

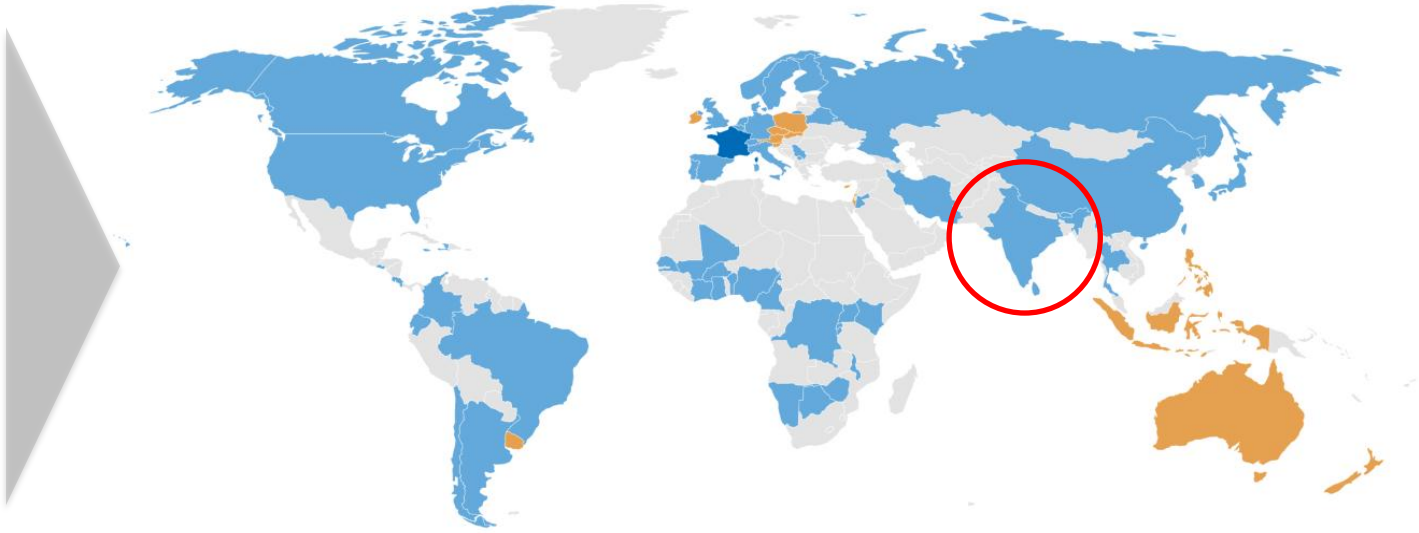



Picture source: https://shop.bsigroup.com/ProductDetail?pid=000000000030334443

# Standards on RE and CE

## Standardisation on CE at international level

- „ISO/TC 323“ technical committee launched in June 2019
- Participation of 59 members, including India (BIS)
- Scope: Develop frameworks, guidance, supporting tools and requirements for the implementation of activities of all involved organizations, to maximize the contribution to Sustainable Development in the context of Circular Economy.



# Standards on RE and CE

## Technical Committee “ISO/TC 323”

- will work on alternative business models and methods for measuring and assessing circularity
- aims to cover circular economy comprehensively, including public procurement, production and distribution, end of life as well as wider areas such as behavioural change in society, and assessment, such as some kind of circularity footprint or index
- works in cooperation with existing committees on subjects that may support Circular Economy

# Summary

**Take-home messages:**

- Standardized production provides benefits for producers, consumers and the environment but can also create market barriers and increase costs
- Standards can be important tools for introducing RE and CE; however, India still lacks specific standards in this field
- By using an environmental checklists, working groups can capture aspects related to RE and CE during the standards development process

# EU-REI

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