Lifetime oriented and sustainable building and civil engineering

CEN standardisation of sustainable building

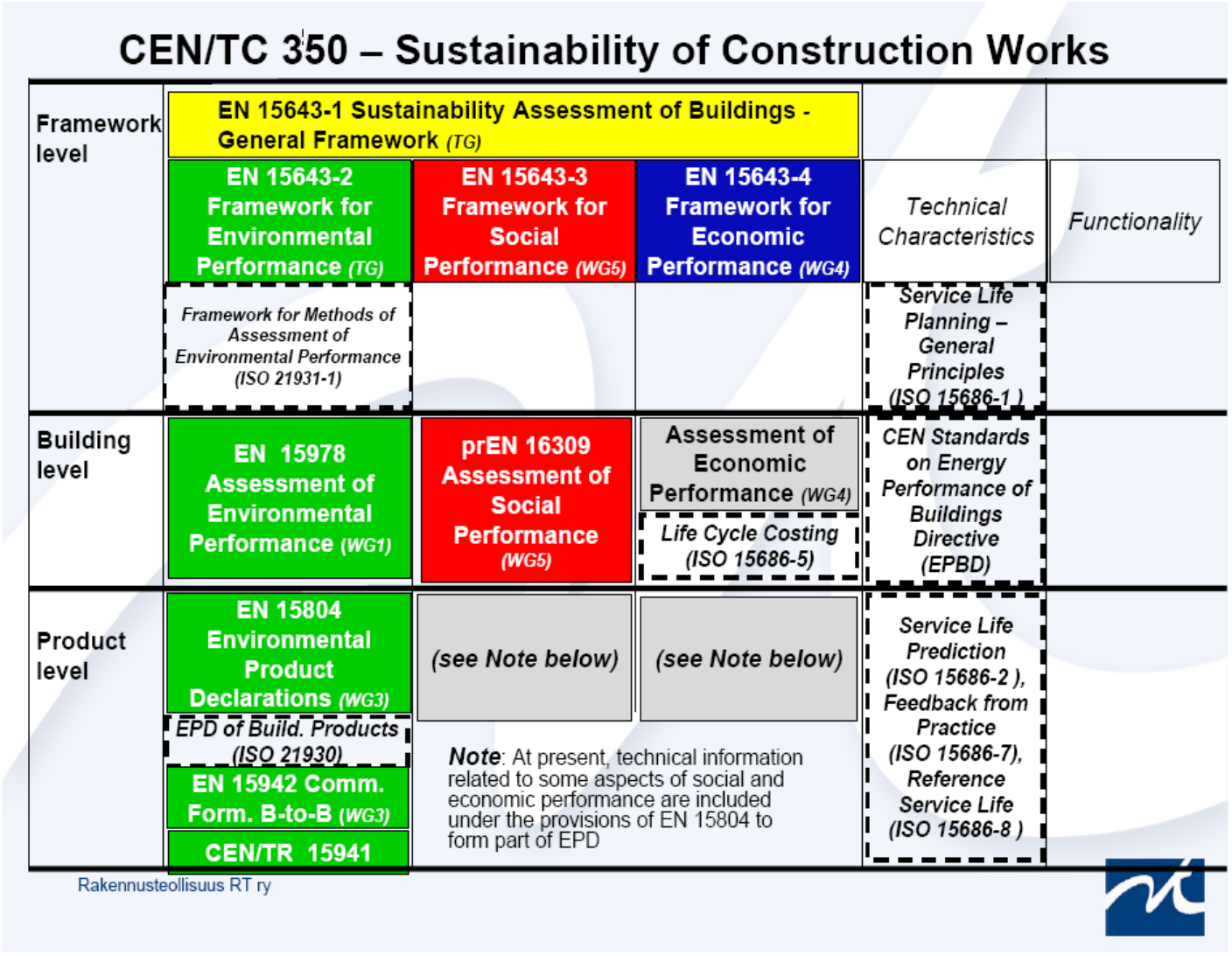
Strategic Goals of EU

- The **Sustainable Development Strategy of the European Union (EU SDS)**, as revised in 2006, is a framework for a **long-term vision of sustainability**.
- European Union has **mainstreamed the objective of sustainable development (SD)** into a broad range of policies.
  - It has, in particular, taken **the lead internationally** in the fight against climate change and is committed to promoting a lowcarbon, knowledge-based, resource-efficient economy.
  - The demand on **natural resources, especially in energy consumption,** has been growing fast and exceeds what the Earth can sustain in the long term**.**
  - **Biodiversity** is in decline globally and major ecosystems are placed under increasing pressure.

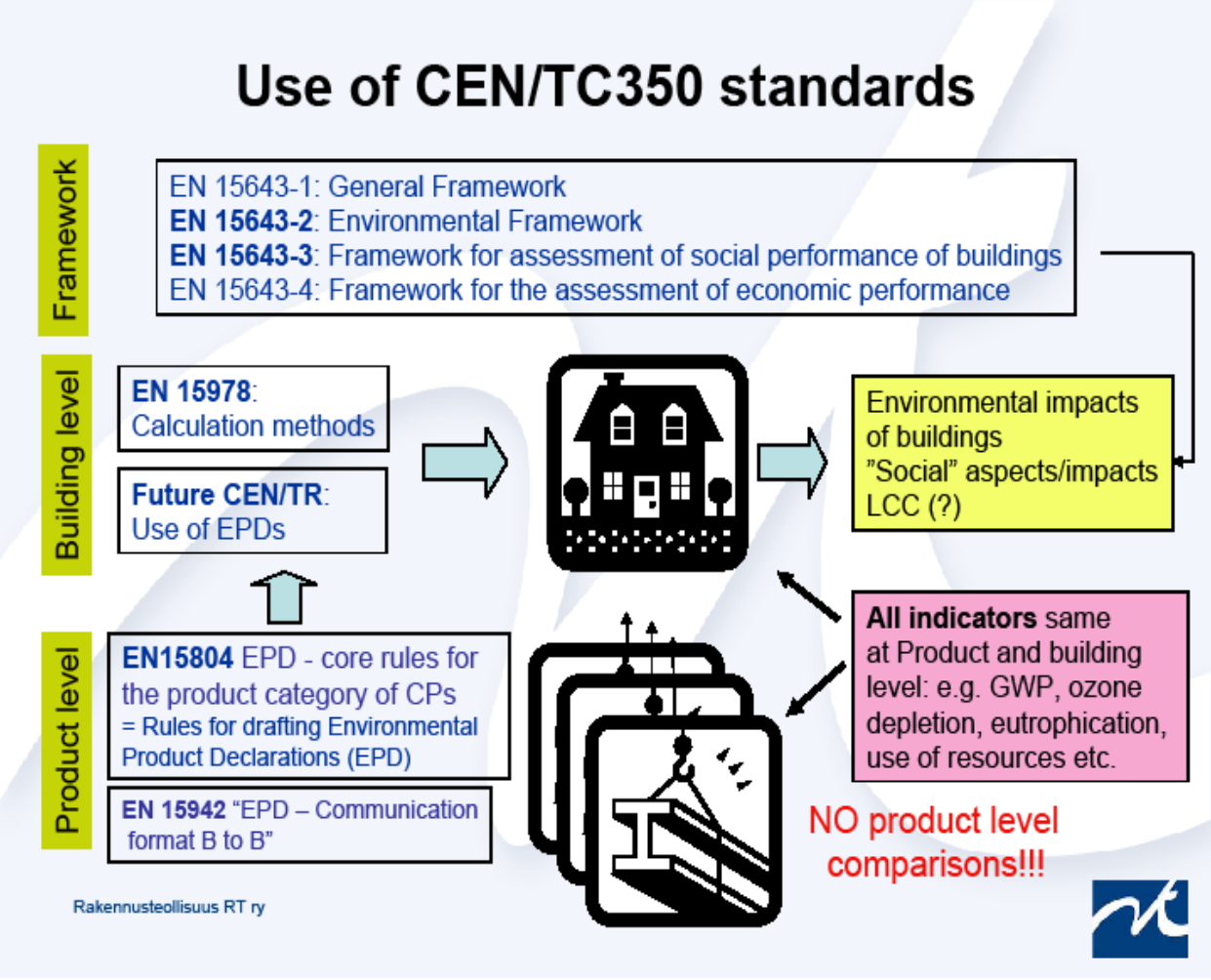
Targets for materials economy and waste reduction

- The Directive lays down important targets for the recycling of waste for the year 2020: 50% for household waste recycling and 70% for construction and demolition waste

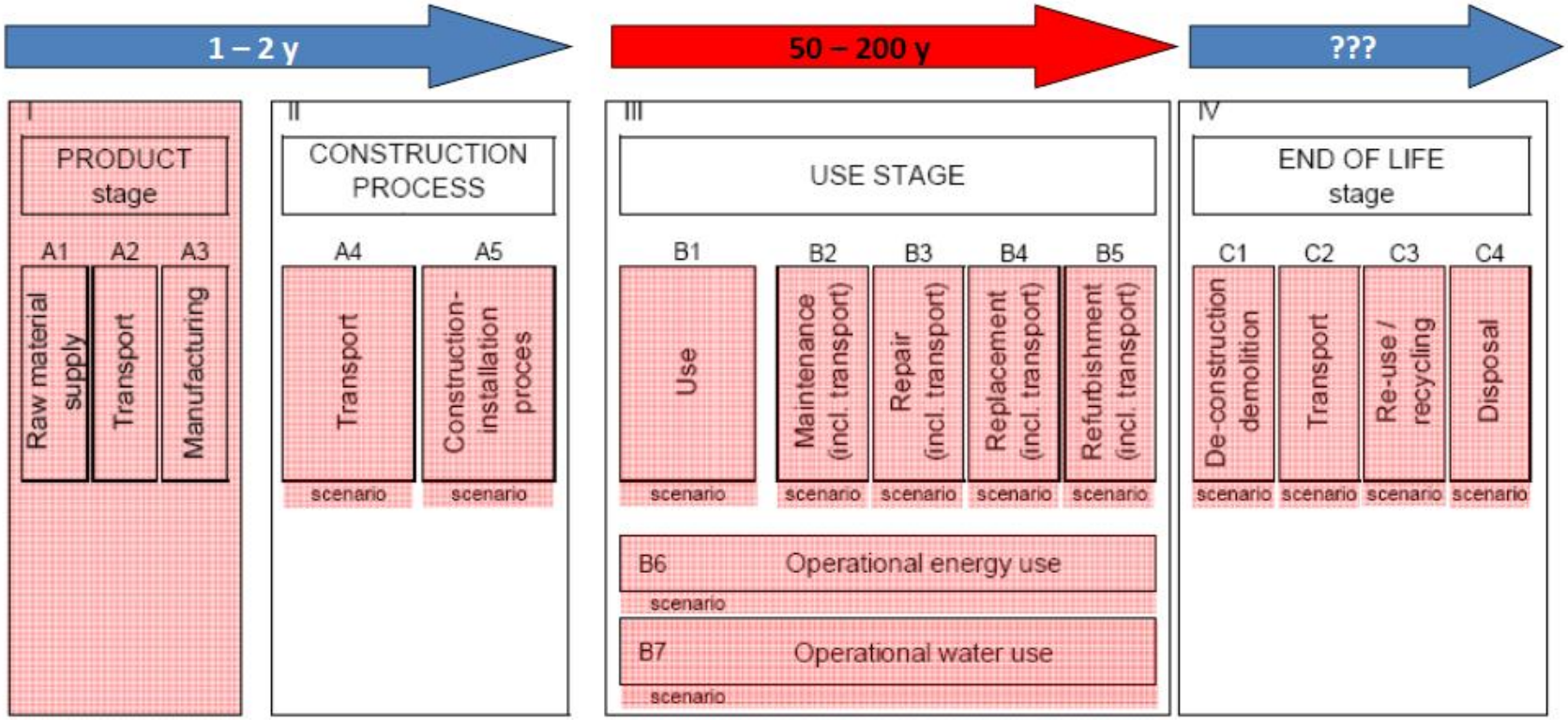
Standards for sustainable buildings to be in common use in 2020



Use of CEN Standards for buildings in 2020



Life cycle construction process



Markets

- **Sustainable construction can be defined as a new and sustainable paradigm** of developers with new solutions.
- This **new paradigm** embraces a design and management of buildings and constructed assets, **drastic improved energy efficiency of buildings, choice of materials, improved building performance as well as interaction with urban and economic development and management**.
- **Two market drivers** on innovation are:
  - (a) the rational use of natural resources (energy, water and materials),
  - (b) the user's convenience and welfare (accessibility, safety & security, indoor air quality, etc.)
- The targets have to be achieved under a very **slow economic growth** during this decade

Trends on the Residential Market

- The users' **requirements will change** more frequently than before.
- **Renovation will integrate new components and prefabricated products** which can be installed and used rapidly.
- **Accessibility and flexibility** will be significantly improved in dwellings throughout their life cycle for all types of users and ages
- There will be an increased emphasis on **energy efficiency, environmental, water, health and safety** issues in the selection of materials and structural components.
  - The **passive house concept** will be more and more widespread even in warm climate conditions, as well as the **integration of renewable energies**.
- **Building management systems** would enable occupants to control a greater variety of **functions for** a **better comfort** (ventilation, air filtration, temperature, lighting, etc.).
- ICT will facilitate remote **supervision, monitoring and control** of appliances, equipment and security systems.
- Harmonous urban and social mix.

Trends on the Infrastructure Market

- Investment on a **more strategic approach towards the long term functional characteristics** of the infrastructure and the associated **life-cycle costs**.
- Considerations depending on the market segment considered and the **specific regional context**.
- Innovation to respond to an increasingly differentiated ownership and usage of premises and facility services, as well as to sustainability issues and **life-cycle considerations** which will become important **decision-making** criteria.
- A growing importance of **retrofitting of buildings and infrastructure**
- More **aware of** the significant impact of the built environment on **climate change, the use of natural resources, air quality, health, the economic activity as a whole and the social cohesion and inclusion**, and of the importance of **integrating various elements** in certain ways in order to meet the economic and societal needs.

Current state of knowledge and development in ECCE countries

Knowledge and tools already exist for the **new paradigm** :

- excellent **strategies, concepts, methodologies, directives, codes, standards and literature**.

- The **challenge** for civil engineers is **to learn and implement this knowledge into praxis:**
  - **Effective actions are needed** for **disseminating the knowledge among civil engineer**s through **information, training, guidance and education**.
  - Modern social media as an interactive collaboration tool

Detailed challences and responsive actions of ECCE

Challence 1:

Construction sector and all its private and public stakeholders should become more **proactive** with the sustainable development agenda

Action 1:

Inform the European Society of Civil Engineers on the need to build a close cooperation between the actors

- in decision making, planning design and construction

and

- in the services responsible for the operation and maintenance of the assets

Challences and responsive actions of ECCE (continued)

Challence 2:

There are a number of strategies and initiatives at European and national levels but not a unified plan to transform them to real-life practices

Action 2:

Implement new paradigm into business and **practice**

- **Applying** the principles, processes, methodologies and methods of **Life Cycle Engineering (LCE**) of the **IT**
- Using the modern **Internet Society** for **information exchange and knowledge distribution** between partners of construction sector

Challences and responsive actions of ECCE (continued)

Challenge 3:

- **Standardisation** process cannot alone deal rapidly enough with new technologies

Action 3:

- Create **voluntary paths** to support the market development. Combine this into the Actions 1. and 2.

Challences and responsive actions of ECCE (continued)

Challence 4:

Objective of EU: Improve the **energy effectiveness** of the building stock by **25 % until 2020**, and by **85 % until 2050:**

- at reasonable cost conditions in construction and in relation to lifetime costs and
- energy supply with **renewable and low carbon** primary energy

Action 4:

Inform and deliver with knowledge the ECCE Members for implementing energy efficient, **low energy and passive buildings** in practice, combined with renewable energy supplies.

Challences and responsive actions of ECCE

(continued)

Challence 5:

The construction sector needs to further **develop skills and services** to **meet** the customers and occupants the **quality requirements and the lifetime economy** of the assets over the life-cycle.

Action 5:

Develop national and European **education and training** program for improving the skills of building and cIvil engineers in all phases of the sustainable life cycle engineering process.

A basic Question for ECCE

- How can ECCE contribute in solving these very high Challenges?
  - Integrating all knowledge of the Member Organisations and
  - Working interactively with all National Organisations of Civil Engineers
  - For the benefit of all Members of ECCE
- STRATEGIC PLAN 2020 of ECCE has to show a concrete road map for Solving these Challenges