Figure 1: BREEAM

BRE Environment Assessment Method

- Widely used certification method for buildings
- Assesses the following aspects:
  - Management
  - Energy
  - Water
  - Land use and ecology
  - Health and wellbeing
  - Transport
  - Materials
  - Pollution
- Tool for reducing the operating costs and improving the working and living climate
- Uses points system for assessment
- Impact on the design, construction and management of buildings
- Quality assurance and certification used to define and ensure compliance with proven technical standards
- For further information see: www.breeam.org

Figure 2: LEED

Leadership in Energy and Environment Design

- The US Green Building Council's LEED scheme offers four levels of certification (Certified, Silver, Gold Platinum) for sustainable buildings
- LEED points can be attained in the following categories:
  - Sustainable sites: based on the size, location and other impacts of the building on its surroundings
  - Water efficiency: rewards economical water consumption, indoors and outdoors
  - Energy and atmosphere: the most detailed part includes the installation, checking and monitoring of heating and cooling systems, lighting and other equipment as well as the use of renewable energies
  - Materials and resources: outlines environment-friendly strategies for the use of local renewable and reclaimed materials, in order to reduce consumption and promote recycling
  - Indoor environmental quality: concentrates on the reduction of potentially harmful gases in the building and integrates daylight and fresh air
  - Innovation in design: a sort of joker that can be awarded for exemplary performance in the category or efficient new technology
- For further information see: www.usgbc.org (the U.S. Green Building Council's website)

Figure 3: DGNB

Deutsche Gesellschaft für Nachhaltiges Bauen e.V.

- Set up in cooperation with the German Federal Ministry of Transport, Building and Urban Development (BMVBS)
- Aims to plan and assess sustainable buildings
- Covers all the relevant areas of construction, approx. 60 criteria from the following fields:
  - Ecology
  - Economics
  - Socio-cultural and functional aspects
  - Technology
  - Processes
  - Site
- Certificates in Bronze, Silver and Gold
- Holistic study of the building's life cycle:
  - Sustainability targets can already be defined at the planning stage
  - On the basis of these targets, state-of-the-art, sustainable buildings are constructed
- For further information see: www.dgnb.de

Figure 4: HQE

Haute Qualité Environnementale des bâtiments

- A platform for building and sustainable development
- The objectives are:
  - to encourage rethinking in terms of ecology
  - to initiate optimization processes
- Method covers three phases: commissioning, design and implementation
- Two aspects are central: ecological management and sustainable building design
- Assessment criteria:
  - Integration of the building in its surroundings
  - Integrated choice of construction method and materials
  - Absence of harmful substances
  - Energy management
  - Water efficiency
  - Waste management
  - Maintenance and operation management
  - Living comfort
  - Hygiene of sanitary and kitchen facilities
  - Air and water quality
- For further information see: www.assohqe.org/hqe

Figure 5: Timeline showing the development of green building schemes in various countries

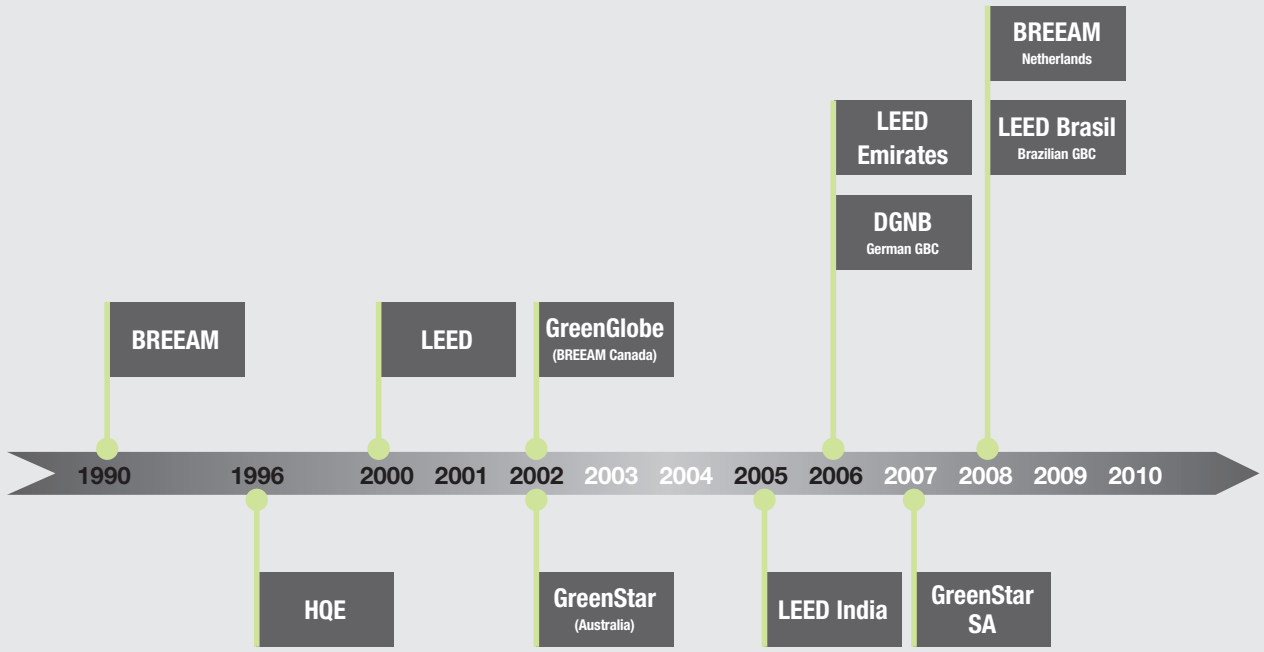


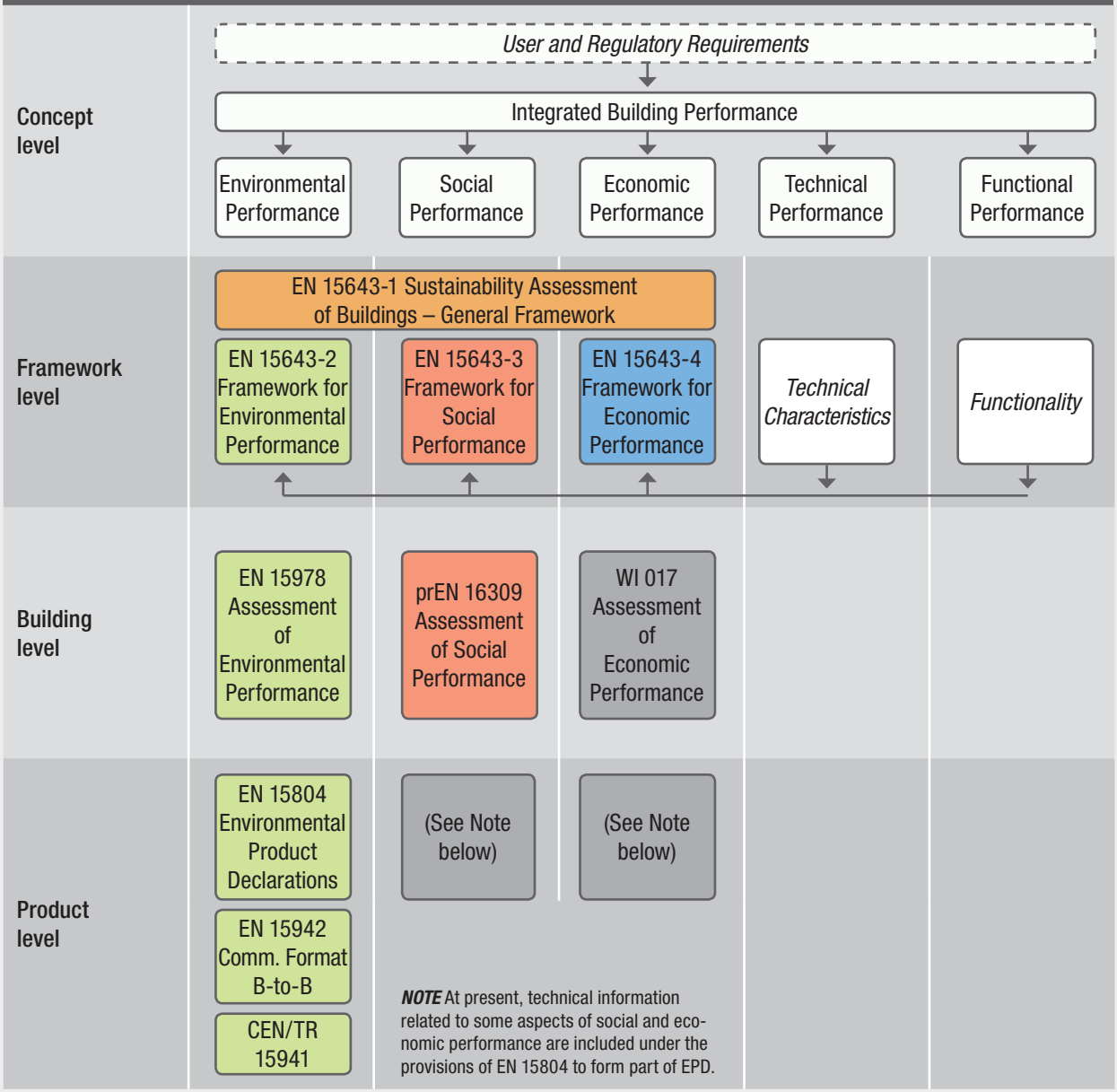
Figure 6: Comparison of the assessment criteria used by the various green building schemes

	U.K	U.S.	France	Germany
Assessment criteria	BREEAM	LEED	HQE	DGNB
Energy	X	X	X	X
CO_2	X		X	X
Ecology	X	X	X	X
Economy			?	X
Health and wellbeing	X		X	X
Indoor environmental quality	X	X	X	X
Innovation	X	X	?	?
Land use	X	X	X	?
Management	X		?	?
Materials	X		?	X
Pollution	X	X	X	X
Renewable technologies	X	X	?	?
Transport	X	X	?	X
Waste	X		X	?
Water	X	X	X	X

Source: King Sturge. European Property Sustainability Matters–Benchmark Tools and Legal Requirements. London, 2009.

? = Data for DGNB and HQE is not exhaustive and additional criteria may be included in the assessment

Figure 7: Overview of the standardization activities in CEN TC 350 'Sustainability of Construction Works'

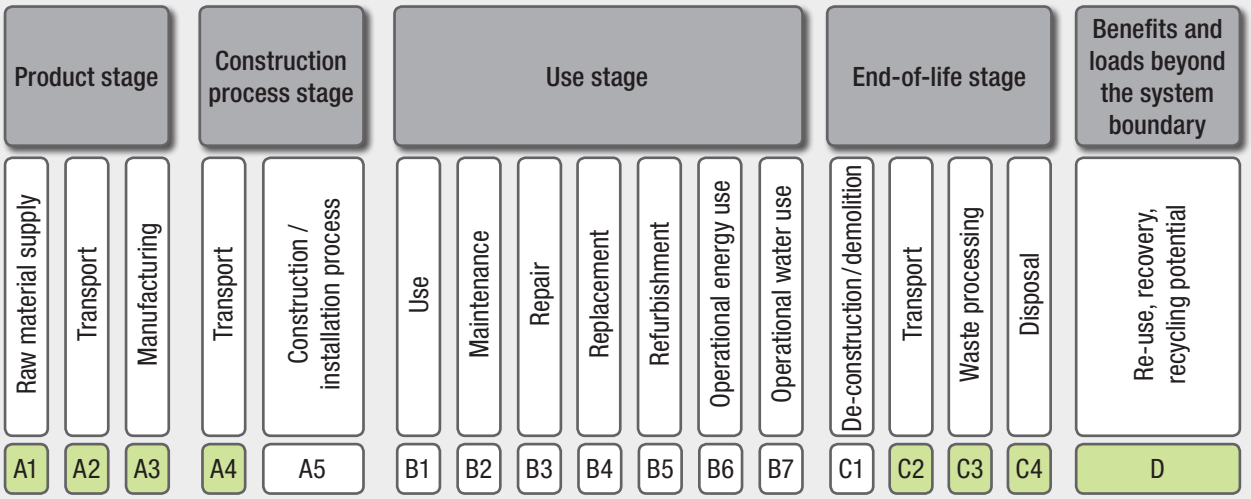


Source: http://portailgroupe.afnor.fr/public_espacenormalisation/CENTC350/standards_overview.html

Figure 8: Types of environmetal declarations (eco-labels according to ISO-standards):

Type I	Declarations are made by a third party (according to ISO 14024) affirming compliance with pre-determined, multi-attribute, lifecycle-based environmental performance requirements (e.g. German 'Blauer Engel' or 'US Greenseal').
Type II	Declarations reflect environmental performance claims made by a product manufacturer (according to ISO 14021). The performance criteria have not been independently verified (e.g. US 'GreenGuard' or 'EnergyStar').
Type III	Declarations (according to ISO 14025) present in a consistent manner objective, quantifiable, lifecycle-based environmental product information which has been independently verified by a third party. Also known as Environmental Product Declarations (EPDs).

Figure 9: Types of EPD with respect to the life cycle stages covered and modules for the building assessment



(Illustration based on Figure 1 of the EN 15804)